



Consiglio Regionale della Campania



Epc

*Al Presidente della II Commissione
Consiliare permanente*

Ai Presidenti dei Gruppi Consiliari

*Al Questore delle Finanze del Consiglio Regionale
On. Antonio Marciano
D.G. Risorse Umane Finanziarie e Strumentali
Dott.ssa. Lucia Coretto*

SEDE

Oggetto: Delibera di Giunta Regionale n. 723 del 13/12/2016

Progetto Repair. Acquisizione in termini di competenza e di cassa. Ai sensi dell'art. 4 comma 2 lettera a) della L.R. n. 2/2016 nel bilancio di previsione per gli esercizi finanziari 2016, 2017 e 2018. Istituzione capitoli.

-REG. GEN. N. 324/II-

Si trasmette per opportuna conoscenza, il provvedimento in oggetto .

Il Dirigente U.D. Assemblea

Avv. Giuseppe Storti

Il Direttore Generale Attività Legislativa

Avv. Magda Fabbrocini

L/G

1. The first part of the paper is devoted to the study of the properties of the function $f(x)$ defined by the equation $f(x) = \int_0^x f(t) dt$. It is shown that $f(x)$ is a constant function, and its value is determined by the initial condition $f(0)$.

2. In the second part, we consider the problem of finding the maximum and minimum values of the function $f(x)$ on the interval $[a, b]$. It is shown that the maximum value of $f(x)$ is attained at the point $x = a$, and the minimum value is attained at the point $x = b$.

3. The third part of the paper is devoted to the study of the properties of the function $f(x)$ defined by the equation $f(x) = \int_0^x f(t) dt$. It is shown that $f(x)$ is a constant function, and its value is determined by the initial condition $f(0)$.

4. In the fourth part, we consider the problem of finding the maximum and minimum values of the function $f(x)$ on the interval $[a, b]$. It is shown that the maximum value of $f(x)$ is attained at the point $x = a$, and the minimum value is attained at the point $x = b$.

5. The fifth part of the paper is devoted to the study of the properties of the function $f(x)$ defined by the equation $f(x) = \int_0^x f(t) dt$. It is shown that $f(x)$ is a constant function, and its value is determined by the initial condition $f(0)$.

6. In the sixth part, we consider the problem of finding the maximum and minimum values of the function $f(x)$ on the interval $[a, b]$. It is shown that the maximum value of $f(x)$ is attained at the point $x = a$, and the minimum value is attained at the point $x = b$.

7. The seventh part of the paper is devoted to the study of the properties of the function $f(x)$ defined by the equation $f(x) = \int_0^x f(t) dt$. It is shown that $f(x)$ is a constant function, and its value is determined by the initial condition $f(0)$.

8. In the eighth part, we consider the problem of finding the maximum and minimum values of the function $f(x)$ on the interval $[a, b]$. It is shown that the maximum value of $f(x)$ is attained at the point $x = a$, and the minimum value is attained at the point $x = b$.

9. The ninth part of the paper is devoted to the study of the properties of the function $f(x)$ defined by the equation $f(x) = \int_0^x f(t) dt$. It is shown that $f(x)$ is a constant function, and its value is determined by the initial condition $f(0)$.

10. In the tenth part, we consider the problem of finding the maximum and minimum values of the function $f(x)$ on the interval $[a, b]$. It is shown that the maximum value of $f(x)$ is attained at the point $x = a$, and the minimum value is attained at the point $x = b$.

Deliberazione N.

723

Assessore

Vicepresidente Bonavitacola Fulvio

Assessore D'Alessio Lidia

Dipartim.

Direzione G.

53
559
13

Regione Campania

GIUNTA REGIONALE

SEDUTA DEL

13/12/2016

ATTIVITÀ AMM.VA

REG. GEN. N. 324/II

PROCESSO VERBALE

Oggetto :

Progetto Repair. Acquisizione in termini di competenza e di cassa, ai sensi dell'art.4, co. 2 lett. a) della Legge Regionale del 18 Gennaio 2016 n. 2 nel bilancio di previsione per gli esercizi finanziari 2016, 2017 e 2018. Istituzione capitoli

1)	Presidente	Vincenzo	DE LUCA	PRESIDENTE
2)	Vice Presidente	Fulvio	BONAVITACOLA	
3)	Assessore	Serena	ANGIOLI	
4)	"	Lidia	D'ALESSIO	
5)	"	Valeria	FASCIONE	
6)	"	Lucia	FORTINI	
7)	"	Amedeo	LEPORE	
8)	"	Chiara	MARCIANI	
9)	"	Corrado	MATERA	ASSENTE
10)	"	Sonia	PALMERI	
	Segretario	Mauro	FERRARA	

A.O.O. Consiglio Regionale della Campania
Protocollo: 0022511/E Data: 15/12/2016 10:06
Ufficio: Segreteria Generale
Classifica:



14/12/16
LEGISLATIVA

Alla stregua dell'istruttoria compiuta dalla Direzione Generale e delle risultanze e degli atti tutti richiamati nelle premesse che seguono, costituenti istruttoria a tutti gli effetti di legge, nonché dell'espressa dichiarazione di regolarità della stessa resa dal Direttore a mezzo di sottoscrizione della presente

PREMESSO:

- a. che la Regione Campania, in collaborazione con il Dipartimento di Architettura (DIARC) dell'Università di Napoli Federico II, partecipa al progetto REPAIR nell'ambito di Horizon 2020 finanziato dalla Commissione Europea per la ricerca scientifica e l'innovazione per il settennio 2014/2020;
- b. che lo scopo principale di REPAIR è favorire lo sviluppo di strategie locali che concepiscano il "ciclo-rifiuti" come "risorsa" nell'ottica dell'economia circolare;
- c. che l'attività scientifica posta in essere è finalizzata a superare l'utilizzo di modelli già esistenti e a costruire idee e soluzioni eco-innovative nella gestione del ciclo dei rifiuti e di rigenerazione delle aree periurbane interessate dai relativi impatti territoriali;
- d. che, in relazione alle materie trattate, la ricerca è curata principalmente dagli uffici regionali competenti in materia di rigenerazione urbana (DG Governo del Territorio) e in materia di gestione integrata dei rifiuti (DG Ambiente ed Ecosistema);
- e. che con nota prot. n. 594/UDCP/GAB/CG dell'11/01/2016 il Presidente della Giunta Regionale ha delegato il Direttore Generale della DG 09 ing. Pietro Angelino, quale legale rappresentante della Regione Campania, per gli adempimenti necessari alle attività di progetto;
- f. che con nota prot. 14621 dell'11/01/2016 il Direttore Generale al Governo del Territorio, d'intesa con il Direttore Generale all'Ambiente ed Ecosistema, ha comunicato alla Commissione Europea il nominativo del Responsabile di Progetto (LEAR) nella persona del Dirigente della UOD 53.09.04 arch. Donata Vizzino;
- g. che il progetto dura 4 anni a partire dal 1 settembre 2016 e, con un budget di 5 milioni di euro, sovvenziona un consorzio di 18 partners europei tra cui la Regione Campania a cui è stato assegnato l'importo di € 78.375,00.

CONSIDERATO

- a. che il finanziamento previsto per il progetto REPAIR copre le seguenti tipologie di spesa:
 - a.1 missione e viaggi € 6.000,00;
 - a.2 fornitura servizi e/o materiali (computer e attrezzature informatiche, traduzioni, comunicazione, pubblicazioni, spese di rappresentanza, cene, ecc.) € 15.675,00;
 - a.3 personale interno per attività di ricerca, consulenti, collaboratori professionali, straordinario per personale interno € 56.700,00;
- b. che la somma complessiva messa a disposizione dalla Commissione Europea per il progetto REPAIR è pari a € 78.375,00 per il triennio 2016-2018 e, nello specifico, euro 15.152,50 già trasferita ed incassata dalla Regione il giorno 5/10/2016, provvisorio di entrata n. 13324;
- c. che per la realizzazione del progetto in parola secondo le direttive della Commissione Europea è necessario provvedere all'istituzione in bilancio del capitolo di Entrata 2467 e dei correlati capitoli di spesa 5510, 5512, 5514, 5516, 5518, 5520, 5522 e 5524, da attribuire alla responsabilità gestionale della UOD Programmazione, attuazione e monitoraggio in materia di riqualificazione urbana, ambientale e dei centri storici della Direzione Generale Governo del Territorio le cui denominazioni e classificazioni sono riportate nell'allegato I al presente provvedimento;

- d. che la Giunta Regionale, ai sensi dell'art. 4, comma 2, lettera a) della Legge Regionale del 18 Gennaio 2016, n. 2, è autorizzata ad iscrivere in bilancio, con propria deliberazione, le entrate derivanti da assegnazioni vincolate a scopi specifici nonché ad iscrivere le relative spese, quando queste siano tassativamente regolate dalla legislazione in vigore;

RITENUTO:

- a. di dover istituire in bilancio il capitolo di entrata 2467 da attribuire alla responsabilità gestionale della UOD Programmazione, attuazione e monitoraggio in materia di riqualificazione urbana, ambientale e dei centri storici della Direzione Generale Governo del Territorio secondo la classificazione come da allegato 1;
- b. di dover istituire, altresì, i capitoli di spesa 5510, 5512, 5514, 5516, 5518, 5520, 5522 e 5524, da attribuire alla responsabilità gestionale della UOD Programmazione, attuazione e monitoraggio in materia di riqualificazione urbana, ambientale e dei centri storici della Direzione Generale Governo del Territorio da correlare al capitolo di entrata di nuova istituzione 2467 e le cui denominazioni e classificazioni sono riportate nell'allegato 2 al presente provvedimento;
- c. di dover iscrivere in termini di competenza e di cassa, ai sensi dell'art. 4, co. 2 lett. a) della Legge Regionale del 18 Gennaio 2016, n. 2, la somma di € 15.152,50 nel bilancio di previsione per l'esercizio finanziario 2016, la somma di € 48.070,00 nel bilancio di previsione per l'esercizio finanziario 2017 e la somma di € 15.152,50 nel bilancio di previsione per l'esercizio finanziario 2018 sul capitolo di entrata di nuova istituzione 2467 correlato ai capitoli di spesa 5510, 5512, 5514, 5516, 5518, 5520, 5522 e 5524 secondo gli importi riportati nell'allegato acquisizione che forma parte integrante e sostanziale della presente deliberazione;
- d. di autorizzare il personale regionale ad effettuare le trasferte internazionali necessarie all'attuazione del Progetto REPAiR per tutta la durata della ricerca, dal 1° settembre 2016 al 31 agosto 2020.

VISTO:

- a. il d. lgs. n. 118/2011;
- b. la L.R. 7/2002 e ss.mm.ii.;
- c. il decreto legislativo 10 agosto 2014, n. 126;
- d. il D.P.C.M. 28 dicembre 2011;
- e. le LL.RR. 1 e 2 /2016;
- f. la delibera di G. R. 52/2016;

PROPONGONO e la Giunta, in conformità, a voto unanime

D E L I B E R A

per i motivi espressi nella narrativa del presente provvedimento che qui si intendono integralmente riportati e confermati:

1. di istituire in bilancio il capitolo di entrata 2467 da attribuire alla responsabilità gestionale della UOD Programmazione, attuazione e monitoraggio in materia di riqualificazione urbana, ambientale e dei centri storici della Direzione Generale Governo del Territorio secondo la classificazione come da allegato 1;
2. di istituire, altresì, i capitoli di spesa 5510, 5512, 5514, 5516, 5518, 5520, 5522 e 5524, da attribuire alla responsabilità gestionale della UOD Programmazione, attuazione e monitoraggio in materia di

riqualificazione urbana, ambientale e dei centri storici della Direzione Generale Governo del Territorio da correlare al capitolo di entrata di nuova istituzione 2467 e le cui denominazioni e classificazioni sono riportate nell'allegato 2 al presente provvedimento;

3. di iscrivere in termini di competenza e di cassa, ai sensi dell'art. 4, co. 2 lett. a) della Legge Regionale del 18 Gennaio 2016, n. 2, la somma di € 15.152,50 nel bilancio di previsione per l'esercizio finanziario 2016, la somma di € 48.070,00 nel bilancio di previsione per l'esercizio finanziario 2017 e la somma di € 15.152,50 nel bilancio di previsione per l'esercizio finanziario 2018 sul capitolo di entrata di nuova istituzione 2467 correlato ai capitoli di spesa 5510, 5512, 5514, 5516, 5518, 5520, 5522 e 5524 secondo gli importi riportati nell'allegato acquisizione che forma parte integrante e sostanziale della presente deliberazione;
4. di autorizzare il personale regionale ad effettuare le trasferte internazionali necessarie all'attuazione del Progetto REPAiR per tutta la durata della ricerca, dal 1° settembre 2016 al 31 agosto 2020;
5. di demandare al Dirigente della UOD Programmazione, attuazione e monitoraggio in materia di riqualificazione urbana, ambientale e dei centri storici della Direzione Generale Governo del Territorio, in qualità di LEAR del progetto REPAiR, tutti gli atti consequenziali;
6. di allegare gli schemi di variazione di bilancio sia per la Spesa che per l'Entrata da inviare al Tesoriere, che formano parte integrante della presente deliberazione;
7. di trasmettere il presente atto:
 - 7.1 al Capo di Gabinetto del Presidente;
 - 7.2 al Capo Dipartimento delle Politiche Territoriali;
 - 7.3 al Capo Dipartimento Risorse Finanziarie, Umane e Strumentali;
 - 7.4 alla Direzione Generale per il Governo del Territorio per quanto di specifica competenza;
 - 7.5 alla Direzione Generale Risorse Finanziarie;
 - 7.6 al Consiglio regionale;
 - 7.7 al Tesoriere regionale;
 - 7.8 alla U.D.C.P. Staff del Capo di Gabinetto per la pubblicazione sul B.U.R.C.



GIUNTA REGIONALE DELLA CAMPANIA

DELIBERAZIONE n°	723	del	13/12/2016	DIPART.	DIR. GEN./DIR. STAFF DIP.	UOD/STAFF DIR. GEN.
				53 55	9 13	4

OGGETTO :

Progetto Repair. Acquisizione in termini di competenza e di cassa, ai sensi dell'art.4, co. 2 lett. a) della Legge Regionale del 18 Gennaio 2016 n. 2 nel bilancio di previsione per gli esercizi finanziari 2016, 2017 e 2018. Istituzione capitoli

QUADRO A	CODICE	COGNOME	MATRICOLA	FIRMA
PRESIDENTE / ASSESSORE /		<i>Vicepresidente Bonavitacola Fulvio Assessore D'Alessio Lidia</i>		<i>12/12/2016 12/12/2016</i>
DIRETTORE GENERALE / DIRIGENTE STAFF DIPARTIMENTO		<i>Dott. Giulivo Italo (interim) dott.ssa Mastrocola Antonietta</i>		<i>07/12/2016 07/12/2016</i>
IL CAPO DIPARTIMENTO		<i>Avv. Carannante Giuseppe dott.ssa Salerno Maria</i>		<i>09/12/2016 09/12/2016</i>

VISTO DIRETTORE GENERALE ATTIVITA' ASSISTENZA GIUNTA	COGNOME	FIRMA
DATA ADOZIONE	13/12/2016	INVIATO PER L'ESECUZIONE IN DATA
		13/12/2016

AI SEGUENTI DIPARTIMENTI E DIREZIONI GENERALI:

- 40 . 1 : Gabinetto del Presidente
- 40 . 2 : Ufficio Legislativo
- 53 : Dipartimento delle Politiche Territoriali
- 53 . 9 : Direzione Generale per il governo del territorio
- 55 : Dipartimento delle Risorse Finanziarie,Umane e Strumentali
- 55 . 13 : Direzione Generale per le risorse finanziarie

Dichiarazione di conformità della copia cartacea:

Il presente documento, ai sensi del T.U. dpr 445/2000 e successive modificazioni è copia conforme cartacea dei dati custoditi in banca dati della Regione Campania.

Firma

ALLEGATO 1

ENTRATE

Titolo	Tipologia	Categoria	Capitolo	DENOMINAZIONE	IV LIVELLO	U.O.D.	COD. UE	SIOPE	RICORRENTI	PERIMETRO SANITA'
2	105	2010501	2467	FINANZIAMENTO UE PER LA REALIZZAZIONE DEL PROGETTO REPAIR	2.01.05.01.000	53 09 04	3	2 02 01	4	3

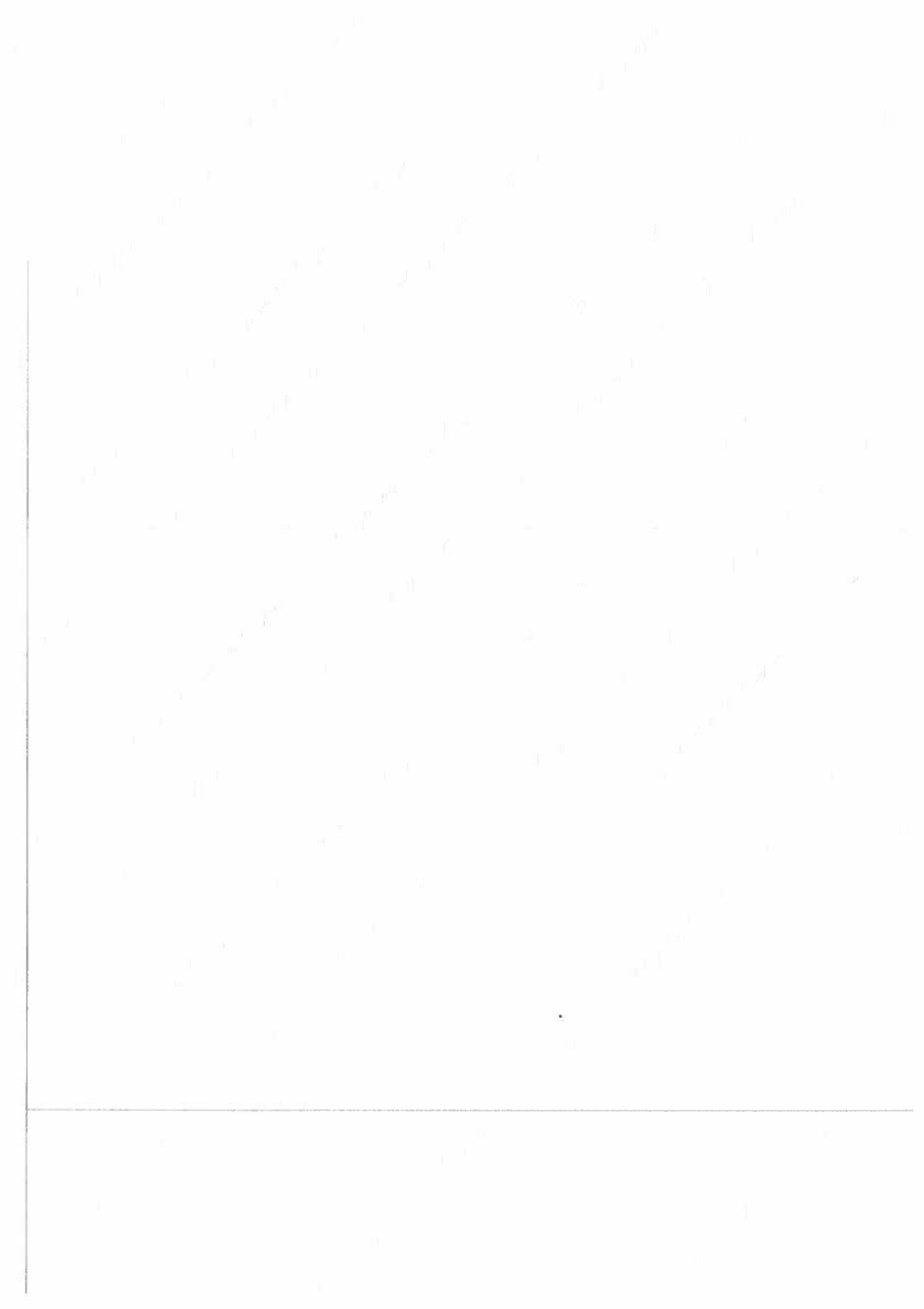
ALLEGATO 2

SPESE

Capitolo	Missione	Programma	Titolo	Macro Aggregato	IV Livello	U.O.D.	COFOG	COD. UE	SIPOE	RICORRENTI	DENOMINAZIONE
5510	9	3	1	103	1.03.02.11.000	53 09 04	05.1	3	1 03 01	4	PERIMETRO SANITA'
											SPESE PER L'ATTUAZIONE DEL PROGETTO REPAIR - TRADUZIONI
5512	9	3	1	103	1.03.02.10.000	53 09 04	05.1	3	1 03 01	4	SPESE PER L'ATTUAZIONE DEL PROGETTO REPAIR
											CONSULENZE ESTERNE
5514	9	3	1	103	1.03.02.02.000	53 09 04	05.1	3	1 02 05	4	SPESE PER L'ATTUAZIONE DEL PROGETTO REPAIR - INDENNITA'
											DI MISSIONE E TRASFERITA
5516	9	3	1	103	1.03.02.02.000	53 09 04	05.1	3	1 03 01	4	SPESE PER L'ATTUAZIONE DEL PROGETTO REPAIR - SPESE DI RAPPRESENTANZA, CONVEGNI E PUBBLICAZIONI
											SPESE PER L'ATTUAZIONE DEL PROGETTO REPAIR - ACQUISTO
5518	9	3	1	202	2.02.01.06.000	53 09 04	05.1	3	2 01 03	4	DI MACCHINE PER L'UFFICIO
											SPESE PER L'ATTUAZIONE DEL PROGETTO REPAIR - PERSONALE INTERNO
5520	9	3	1	101	1.01.01.01.000	53 09 04	05.1	3	1 02 01	4	SPESE PER L'ATTUAZIONE DEL PROGETTO REPAIR - CONTRIBUTI SOCIALI A CARICO DELL'ENTE
5522	9	3	1	101	1.01.02.01.000	53 09 04	05.1	3	1 02 02	4	SPESE PER L'ATTUAZIONE DEL PROGETTO REPAIR - QUOTA IRAP
5524	9	3	1	102	1.02.01.01.000	53 09 04	05.1	3	1 08 02	4	

VARIAZIONE AL BILANCIO DI PREVISIONE 2016/2018 E RELATIVA VARIAZIONE AL DOCUMENTO TECNICO DI ACCOMPAGNAMENTO E AL BILANCIO GESTIONALE 2016/2018
(art. 4, comma 2, lettera a), L.R. 2/2016)

[illegible][illegible]



**Allegato delibera di variazione del bilancio
Rif. Delibera di Giunta n. del**

ENTRATE

VARIAZIONI											
Titolo	Tipologia	Categoria	Capitolo	DENOMINAZIONE	Residui presunti		Previsione di competenza		Previsione di cassa		
					in aumento	in diminuzione	in aumento	in diminuzione	in aumento	in diminuzione	
2	105	2010501	2467	FINANZIAMENTO UE PER LA							5510,
				REALIZZAZIONE DEL			15.152,50		15.152,50		5512,
				PROGETTO REPAIR							5514,
											5516,
											5518,
											5520,
											5522,
											5524
			Totale Tipologia 105 del Titolo 2					15.152,50		15.152,50	
			Totale Titolo 2					15.152,50		15.152,50	
Totale Entrata								15.152,50		15.152,50	

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that proper record-keeping is essential for the transparency and accountability of the organization. This section also outlines the various methods used to collect and analyze data, ensuring that the information is reliable and up-to-date.

2. The second part of the document focuses on the implementation of the proposed changes. It details the steps involved in the transition process, from the initial planning phase to the final execution. This section highlights the challenges faced during the implementation and the strategies used to overcome them. It also provides a timeline for the completion of the project, ensuring that all stakeholders are aware of the progress and can provide input as needed.

3. The third part of the document discusses the future of the organization. It outlines the long-term goals and the strategies to achieve them. This section also addresses the potential risks and opportunities that may arise in the future. It emphasizes the importance of continuous improvement and the need to adapt to changing circumstances. The document concludes with a statement of commitment to the organization's mission and vision, and a call to action for all employees to work together to achieve the organization's goals.

VARIAZIONE DI BILANCIO SPESE
Allegato delibera di variazione del bilancio
Rif. Delibera di Giunta n. del

SPESE

Missione	Programma	Titolo	Macro Aggregato	Capitolo	DENOMINAZIONE	VARIAZIONI										Capitolo di entrata correlato
						Residui presunti		Previsione di competenza		Previsione di cassa		Fondo Pluriennale Vincolato				
						in aumento	in diminuzione	in aumento	in diminuzione	in aumento	in diminuzione	in aumento	in diminuzione			
9	3	1	103	5510	SPESE PER L'ATTUAZIONE DEL			400,00		400,00					2467	
9	3	1	103	5512	PROGETTO REPAIR - TRADUZIONI										2467	
					SPESE PER L'ATTUAZIONE DEL			6.000,00		6.000,00						
					PROGETTO REPAIR											
					CONSULENZE ESTERNE											
9	3	1	103	5514	PROGETTO REPAIR - INDENNITA'			4.000,00		4.000,00					2467	
					DI MISSIONE E TRASFERTA											
					SPESE PER L'ATTUAZIONE DEL			4.752,50		4.752,50						
9	3	1	202	5518	PROGETTO REPAIR - ACQUISTO										2467	
					DI MACCHINE PER L'UFFICIO											
					TOTALE TITOLO 1 PORGRAMMA 3			15.152,50		15.152,50						
					Totale Programma 3 della Missione 9			15.152,50		15.152,50						
					TOTALE MISSIONE 9			15.152,50		15.152,50						
					Totale Spese			15.152,50		15.152,50						



EUROPEAN COMMISSION
Executive Agency for Small and Medium-sized Enterprises
(EASME)
Director



GRANT AGREEMENT

NUMBER — 688920 — REPAIR

This Agreement ('the Agreement') is between the following parties:

on the one part,

the Executive Agency for Small and Medium-sized Enterprises (EASME) ('the Agency'), under the power delegated by the European Commission ('the Commission')¹,

represented for the purposes of signature of this Agreement by Head of Unit, Executive Agency for Small and Medium-sized Enterprises (EASME), OPERATIONS, H2020 Environment & Resources, Arnoldas MILUKAS,

and

on the other part,

1. 'the coordinator':

TECHNISCHE UNIVERSITEIT DELFT (TUD), 27364265, established in STEVINWEG 1, DELFT 2628 CN, Netherlands, NL001569569B01, represented for the purposes of signing the Agreement by Dean of Faculty of Architecture and the Built Environment, Peter RUSSELL

and the following other beneficiaries, if they sign their 'Accession Form' (see Annex 3 and Article 56):

2. **UNIVERSITEIT GENT (UGENT)**, 248015142, established in SINT PIETERSNIEUWSTRAAT 25, GENT 9000, Belgium, BE0248015142,

3. **UNIVERSITA DEGLI STUDI DI NAPOLI FEDERICO II. (UNINA)**, D17903H4, established in Corso Umberto I 40, NAPOLI 80138, Italy, IT00876220633,

4. **HAFENCITY UNIVERSITAT HAMBURG (HCU)**, NONE, established in UBERSEEALLEE 16, HAMBURG 20457, Germany, DE256502509,

5. **MAGYAR TUDOMANYOS AKADEMIA KOZGAZDASAG- ES REGIONALIS TUDOMANYI KUTATOKOZPONT (RKI)**, 15300681722034202, established in PAPNOVELDE U 22, PECS 7621, Hungary, HU15300681,

6. **INSTYTUT GEOGRAFII I PRZESTRZENNEGO ZAGOSPODAROWANIA IM STANISLAWA LESZCZYCKIEGO POLSKIEJ AKADEMII NAUK (IGiPZ)**, 000325854, established in UL. TWARDA 51/55, WARSZAWA 00-818, Poland, PL5250012188,

8. **ARCINIEGAS LOPEZ GUSTAVO (Geo-Col)**, 60965452, established in MARCO POLOSTRAAT 218-2, AMSTERDAM 1057XA, Netherlands, NL252240704B01,

9. **DELTA PROJECTONTWIKKELING BV (Delta) BV**, 23088605, established in BINNEN KALKHAVEN 39, DORDRECHT 3311 JC, Netherlands, NL806587751B01,

¹ Text in *italics* shows the options of the Model Grant Agreement that are applicable to this Agreement.

10. **BIOKOM Pecs Varosuzemeltetesi es Kornyezetgazdalkodasi Nonprofit Korlatolt Felelossegu Tarsasag (BIOKOM)** HU11, 0209062862, established in Siklosi ut 52, Pecs 7632, Hungary, HU11014959,

11. **Gertz Gutsche Rümenapp - Stadtentwicklung und Mobilität GbR (GGR)** GBR, 4162202613, established in Ruhrstraße 11, Hamburg 22761, Germany, DE232599881,

12. **OPENBARE VLAAMSE AFVALSTOFFENMAATSCHAPPIJ (OVAM)**, 0842399963, established in STATIONSSTRAAT 110, MECHELEN 2800, Belgium, BE,

13. **GEMEENTE HAARLEMMERMEER (GHM)**, 34366641, established in RAADHUISPLEIN 1, HOOFFDORF 2130 AG, Netherlands, NL001708879B01,

14. **REGIONE CAMPANIA (CAMPANIA)**, italian constitution act of 1.1.1948 art 131, established in VIA S. LUCIA 81, NAPOLI 80132, Italy, IT80011990639,

15. **OLP SPOLKA Z OGRANICZONA ODPOWIEDZILNOSCIA (PHH) SP(ZOO)**, 361282378, established in UL GABRIELA NARUTOWICZA 34, LODZ 90 135, Poland, PL7252084980,

16. **BAUER UMWELT GMBH (BAUER) GMBH**, 101124, established in In der Scherau, 1, SCHROBENHAUSEN 86529, Germany, DE814453909,

17. **INTERGEMEENTELIJKE VERENIGING VOORAFVALBEHEER IN GENT EN OMSTREKEN (IVAGO)** BE30, 252828916, established in BOTERMARKT 1, GENT 9000, Belgium, BE0252828916,

18. **STADTREINIGUNG HAMBURG AOR (SRH)**, HRA118369, established in BULLERDEICH 19, HAMBURG 20537, Germany, DE811657326,

and 7. the *Joint Research Centre (JRC)* established in Rue de la Loi 200, BRUSSELS 1049, Belgium,, if it signs the 'Administrative Arrangement' (see Annex 3b).

Unless otherwise specified, references to 'beneficiary' or 'beneficiaries' include the coordinator *and the Joint Research Centre (JRC)*.

The parties referred to above have agreed to enter into the Agreement under the terms and conditions below.

By signing the Agreement or the Accession Form *or the Administrative Arrangement*, the beneficiaries accept the grant and agree to implement it under their own responsibility and in accordance with the Agreement, with all the obligations and conditions it sets out.

The Agreement is composed of:

Terms and Conditions

Annex 1 Description of the action

Annex 2 Estimated budget for the action

Annex 3 Accession Forms

3b Administrative Arrangement

Annex 4 Model for the financial statements

Annex 5 Model for the certificate on the financial statements

Annex 6 Model for the certificate on the methodology

TERMS AND CONDITIONS

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CHAPTER 1 GENERAL

ARTICLE 1 — SUBJECT OF THE AGREEMENT

This Agreement sets out the rights and obligations and the terms and conditions applicable to the grant awarded to the beneficiaries for implementing the action set out in Chapter 2.

CHAPTER 2 ACTION

ARTICLE 2 — ACTION TO BE IMPLEMENTED

The grant is awarded for the action entitled '*REPAiR - REsource Management in Peri-urban AREas: Going Beyond Urban Metabolism — REPAiR*' ('action'), as described in Annex 1.

ARTICLE 3 — DURATION AND STARTING DATE OF THE ACTION

The duration of the action will be **48 months** as of *1 September 2016* ('starting date of the action').

ARTICLE 4 — ESTIMATED BUDGET AND BUDGET TRANSFERS

4.1 Estimated budget

The 'estimated budget' for the action is set out in Annex 2.

It contains the estimated eligible costs and the forms of costs, broken down by beneficiary and budget category (see Articles 5, 6).

4.2 Budget transfers

The estimated budget breakdown indicated in Annex 2 may be adjusted by transfers of amounts between beneficiaries or between budget categories (or both). This does not require an amendment according to Article 55, if the action is implemented as described in Annex 1.

However, the beneficiaries may not add costs relating to subcontracts not provided for in Annex 1, unless such additional subcontracts are approved by an amendment or in accordance with Article 13.

CHAPTER 3 GRANT

ARTICLE 5 — GRANT AMOUNT, FORM OF GRANT, REIMBURSEMENT RATES AND FORMS OF COSTS

5.1 Maximum grant amount

The 'maximum grant amount' is EUR 5,089,636.25 (five million eighty nine thousand six hundred and thirty six EURO and twenty five eurocents).

5.2 Form of grant, reimbursement rates and forms of costs

The grant reimburses *100% of the action's eligible costs* (see Article 6) ('reimbursement of eligible costs grant') (see Annex 2).

The estimated eligible costs of the action are EUR 5,089,636.25 (five million eighty nine thousand six hundred and thirty six EURO and twenty five eurocents).

Eligible costs (see Article 6) must be declared under the following forms ('forms of costs'):

(a) for **direct personnel costs**:

- as actually incurred costs ('actual costs') or
- on the basis of an amount per unit calculated by the beneficiary in accordance with its usual cost accounting practices ('unit costs').

Personnel costs for SME owners or beneficiaries that are natural persons not receiving a salary (see Article 6.2, Points A.4 and A.5) must be declared on the basis of the amount per unit set out in Annex 2 (unit costs);

(b) for **direct costs for subcontracting**: as actually incurred costs (actual costs);

(c) for **direct costs of providing financial support to third parties**: *not applicable*;

(d) for **other direct costs**: as actually incurred costs (actual costs);

(e) for **indirect costs**: on the basis of a flat-rate applied as set out in Article 6.2, Point E ('flat-rate costs');

(f) *specific cost category(ies): not applicable.*

5.3 Final grant amount — Calculation

The 'final grant amount' depends on the actual extent to which the action is implemented in accordance with the Agreement's terms and conditions.

This amount is calculated by the Agency — when the payment of the balance is made (see Article 21.4) — in the following steps:

Step 1 — Application of the reimbursement rates to the eligible costs

Step 2 — Limit to the maximum grant amount

Step 3 — Reduction due to the no-profit rule

Step 4 — Reduction due to improper implementation or breach of other obligations

5.3.1 Step 1 — Application of the reimbursement rates to the eligible costs

The reimbursement rate(s) (see Article 5.2) are applied to the eligible costs (actual costs, unit costs and flat-rate costs; see Article 6) declared by the beneficiaries (see Article 20) and approved by the Agency (see Article 21).

5.3.2 Step 2 — Limit to the maximum grant amount

If the amount obtained following Step 1 is higher than the maximum grant amount set out in Article 5.1, it will be limited to the latter.

5.3.3 Step 3 — Reduction due to the no-profit rule

The grant must not produce a profit.

‘Profit’ means the surplus of the amount obtained following Steps 1 and 2 plus the action’s total receipts, over the action’s total eligible costs.

The ‘action’s total eligible costs’ are the consolidated total eligible costs approved by the *Agency*.

The ‘action’s total receipts’ are the consolidated total receipts generated during its duration (see Article 3).

The following are considered receipts:

- (a) income generated by the action; if the income is generated from selling equipment or other assets purchased under the Agreement, the receipt is up to the amount declared as eligible under the Agreement;
- (b) financial contributions given by third parties to the beneficiary specifically to be used for the action, and
- (c) in-kind contributions provided by third parties free of charge and specifically to be used for the action, if they have been declared as eligible costs.

The following are however not considered receipts:

- (a) income generated by exploiting the action’s results (see Article 28);
- (b) financial contributions by third parties, if they may be used to cover costs other than the eligible costs (see Article 6);
- (c) financial contributions by third parties with no obligation to repay any amount unused at the end of the period set out in Article 3.

If there is a profit, it will be deducted from the amount obtained following Steps 1 and 2.

5.3.4 Step 4 — Reduction due to improper implementation or breach of other obligations — Reduced grant amount — Calculation

If the grant is reduced (see Article 43), the *Agency* will calculate the reduced grant amount by deducting the amount of the reduction (calculated in proportion to the improper implementation of the action or to the seriousness of the breach of obligations in accordance with Article 43.2) from the maximum grant amount set out in Article 5.1.

The final grant amount will be the lower of the following two:

- the amount obtained following Steps 1 to 3 or
- the reduced grant amount following Step 4.

5.4 Revised final grant amount — Calculation

If — after the payment of the balance (in particular, after checks, reviews, audits or investigations; see Article 22) — the *Agency* rejects costs (see Article 42) or reduces the grant (see Article 43), it will calculate the ‘**revised final grant amount**’ for the beneficiary concerned by the findings.

This amount is calculated by the *Agency* on the basis of the findings, as follows:

- in case of **rejection of costs**: by applying the reimbursement rate to the revised eligible costs approved by the *Agency* for the beneficiary concerned;
- in case of **reduction of the grant**: by calculating the concerned beneficiary’s share in the grant amount reduced in proportion to its improper implementation of the action or to the seriousness of its breach of obligations (see Article 43.2).

In case of **rejection of costs and reduction of the grant**, the revised final grant amount for the beneficiary concerned will be the lower of the two amounts above.

ARTICLE 6 — ELIGIBLE AND INELIGIBLE COSTS

6.1 General conditions for costs to be eligible

‘**Eligible costs**’ are costs that meet the following criteria:

(a) for **actual costs**:

- (i) they must be actually incurred by the beneficiary;
- (ii) they must be incurred in the period set out in Article 3, with the exception of costs relating to the submission of the periodic report for the last reporting period and the final report (see Article 20);
- (iii) they must be indicated in the estimated budget set out in Annex 2;
- (iv) they must be incurred in connection with the action as described in Annex 1 and necessary for its implementation;
- (v) they must be identifiable and verifiable, in particular recorded in the beneficiary’s accounts in accordance with the accounting standards applicable in the country where the beneficiary is established and with the beneficiary’s usual cost accounting practices;
- (vi) they must comply with the applicable national law on taxes, labour and social security, and
- (vii) they must be reasonable, justified and must comply with the principle of sound financial management, in particular regarding economy and efficiency;

(b) for **unit costs**:

(i) they must be calculated as follows:

{amounts per unit set out in Annex 2 or calculated by the beneficiary in accordance with its usual cost accounting practices (see Article 6.2, Point A)}

multiplied by

the number of actual units};

(ii) the number of actual units must comply with the following conditions:

- the units must be actually used or produced in the period set out in Article 3;
- the units must be necessary for implementing the action or produced by it, and
- the number of units must be identifiable and verifiable, in particular supported by records and documentation (see Article 18);

(c) for flat-rate costs:

(i) they must be calculated by applying the flat-rate set out in Annex 2, and

(ii) the costs (actual costs or unit costs) to which the flat-rate is applied must comply with the conditions for eligibility set out in this Article.

6.2 Specific conditions for costs to be eligible

Costs are eligible if they comply with the general conditions (see above) and the specific conditions set out below for each of the following budget categories:

- A. direct personnel costs;
- B. direct costs of subcontracting;
- C. *not applicable*;
- D. other direct costs;
- E. indirect costs;
- F. *not applicable*.

‘Direct costs’ are costs that are directly linked to the action implementation and can therefore be attributed to it directly. They must not include any indirect costs (see Point E below).

‘Indirect costs’ are costs that are not directly linked to the action implementation and therefore cannot be attributed directly to it.

A. Direct personnel costs**Types of eligible personnel costs**

A.1 Personnel costs are eligible, if they are related to personnel working for the beneficiary under an employment contract (or equivalent appointing act) and assigned to the action (‘costs for employees (or equivalent)’). They must be limited to salaries (including during parental leave), social security contributions, taxes and other costs included in the remuneration, if they arise from national law or the employment contract (or equivalent appointing act).

Beneficiaries that are non-profit legal entities² may also declare as personnel costs **additional remuneration** for personnel assigned to the action (including payments on the basis of supplementary contracts regardless of their nature), if:

- (a) it is part of the beneficiary's usual remuneration practices and is paid in a consistent manner whenever the same kind of work or expertise is required;
- (b) the criteria used to calculate the supplementary payments are objective and generally applied by the beneficiary, regardless of the source of funding used.

Additional remuneration for personnel assigned to the action is eligible up to the following amount:

- (a) if the person works full time and exclusively on the action during the full year: up to EUR 8 000;
- (b) if the person works exclusively on the action but not full-time or not for the full year: up to the corresponding pro-rata amount of EUR 8 000, or
- (c) if the person does not work exclusively on the action: up to a pro-rata amount calculated as follows:

 {EUR 8 000
 divided by
 the number of annual productive hours (see below)},
 multiplied by
 the number of hours that the person has worked on the action during the year}.

A.2 The costs for natural persons working under a direct contract with the beneficiary other than an employment contract are eligible personnel costs, if:

- (a) the person works under the beneficiary's instructions and, unless otherwise agreed with the beneficiary, on the beneficiary's premises;
- (b) the result of the work carried out belongs to the beneficiary, and
- (c) the costs are not significantly different from those for personnel performing similar tasks under an employment contract with the beneficiary.

A.3 The costs of personnel seconded by a third party against payment are eligible personnel costs, if the conditions in Article 11.1 are met.

² For the definition, see Article 2.1(14) of the Rules for Participation Regulation No 1290/2013: 'non-profit legal entity' means a legal entity which by its legal form is non-profit-making or which has a legal or statutory obligation not to distribute profits to its shareholders or individual members.

A.4 Costs of owners of beneficiaries that are small and medium-sized enterprises ('SME owners') who are working on the action and who do not receive a salary are eligible personnel costs, if they correspond to the amount per unit set out in Annex 2 multiplied by the number of actual hours worked on the action.

A.5 Costs of 'beneficiaries that are natural persons' not receiving a salary are eligible personnel costs, if they correspond to the amount per unit set out in Annex 2 multiplied by the number of actual hours worked on the action.

Calculation

Personnel costs must be calculated by the beneficiaries as follows:

{ {hourly rate
multiplied by
the number of actual hours worked on the action},
plus
for non-profit legal entities: additional remuneration to personnel assigned to the action under the conditions set out above (Point A.1)}.

The number of actual hours declared for a person must be identifiable and verifiable (see Article 18).

The total number of hours declared in EU or Euratom grants, for a person for a year, cannot be higher than the annual productive hours used for the calculations of the hourly rate. Therefore, the maximum number of hours that can be declared for the grant is:

{the number of annual productive hours for the year (see below)
minus
total number of hours declared by the beneficiary for that person in that year for other EU or Euratom grants}.

The 'hourly rate' is one of the following:

(a) for personnel costs declared as **actual costs**: the hourly rate is the amount calculated as follows:

{actual annual personnel costs (excluding additional remuneration) for the person
divided by
number of annual productive hours}.

The beneficiaries must use the annual personnel costs and the number of annual productive hours for each financial year covered by the reporting period. If a financial year is not closed at the end of the reporting period, the beneficiaries must use the hourly rate of the last closed financial year available.

For the 'number of annual productive hours', the beneficiaries may choose one of the following:

(i) 'fixed number of hours': 1 720 hours for persons working full time (or corresponding pro-rata for persons not working full time);

- (ii) 'individual annual productive hours': the total number of hours worked by the person in the year for the beneficiary, calculated as follows:

{annual workable hours of the person (according to the employment contract, applicable collective labour agreement or national law)

plus

overtime worked

minus

absences (such as sick leave and special leave)).

'Annual workable hours' means the period during which the personnel must be working, at the employer's disposal and carrying out his/her activity or duties under the employment contract, applicable collective labour agreement or national working time legislation.

If the contract (or applicable collective labour agreement or national working time legislation) does not allow to determine the annual workable hours, this option cannot be used;

- (iii) 'standard annual productive hours': the 'standard number of annual hours' generally applied by the beneficiary for its personnel in accordance with its usual cost accounting practices. This number must be at least 90% of the 'standard annual workable hours'.

If there is no applicable reference for the standard annual workable hours, this option cannot be used.

For all options, the actual time spent on **parental leave** by a person assigned to the action may be deducted from the number of annual productive hours;

- (b) for personnel costs declared on the basis of **unit costs**: the hourly rate is one of the following:

- (i) for SME owners or beneficiaries that are natural persons: the hourly rate set out in Annex 2 (see Points A.4 and A.5 above), or

- (ii) for personnel costs declared on the basis of the beneficiary's usual cost accounting practices: the hourly rate calculated by the beneficiary in accordance with its usual cost accounting practices, if:

- the cost accounting practices used are applied in a consistent manner, based on objective criteria, regardless of the source of funding;
- the hourly rate is calculated using the actual personnel costs recorded in the beneficiary's accounts, excluding any ineligible cost or costs included in other budget categories.

The actual personnel costs may be adjusted by the beneficiary on the basis of budgeted or estimated elements. Those elements must be relevant for calculating

the personnel costs, reasonable and correspond to objective and verifiable information;

and

- the hourly rate is calculated using the number of annual productive hours (see above).

B. Direct costs of subcontracting (including related duties, taxes and charges such as non-deductible value added tax (VAT) paid by the beneficiary) are eligible if the conditions in Article 13.1.1 are met.

C. Direct costs of providing financial support to third parties *not applicable*.

D. Other direct costs

D.1 Travel costs and related subsistence allowances (including related duties, taxes and charges such as non-deductible value added tax (VAT) paid by the beneficiary) are eligible if they are in line with the beneficiary's usual practices on travel.

D.2 *The depreciation costs of equipment, infrastructure or other assets (new or second-hand) as recorded in the beneficiary's accounts are eligible, if they were purchased in accordance with Article 10.1.1 and written off in accordance with international accounting standards and the beneficiary's usual accounting practices.*

The costs of renting or leasing equipment, infrastructure or other assets (including related duties, taxes and charges such as non-deductible value added tax (VAT) paid by the beneficiary) are also eligible, if they do not exceed the depreciation costs of similar equipment, infrastructure or assets and do not include any financing fees.

The costs of equipment, infrastructure or other assets contributed in-kind against payment are eligible, if they do not exceed the depreciation costs of similar equipment, infrastructure or assets, do not include any financing fees and if the conditions in Article 11.1 are met.

The only portion of the costs that will be taken into account is that which corresponds to the duration of the action and rate of actual use for the purposes of the action.

D.3 Costs of other goods and services (including related duties, taxes and charges such as non-deductible value added tax (VAT) paid by the beneficiary) are eligible, if they are:

- (a) purchased specifically for the action and in accordance with Article 10.1.1 or
- (b) contributed in kind against payment and in accordance with Article 11.1.

Such goods and services include, for instance, consumables and supplies, dissemination (including open access), protection of results, certificates on the financial statements (if they are required by the Agreement), certificates on the methodology, translations and publications.

D.4 Capitalised and operating costs of 'large research infrastructure'³ directly used for the action are eligible, if:

- (a) the value of the large research infrastructure represents at least 75% of the total fixed assets (at historical value in its last closed balance sheet before the date of the signature of the Agreement or as determined on the basis of the rental and leasing costs of the research infrastructure⁴);*
- (b) the beneficiary's methodology for declaring the costs for large research infrastructure has been positively assessed by the Commission ('ex-ante assessment');*
- (c) the beneficiary declares as direct eligible costs only the portion which corresponds to the duration of the action and the rate of actual use for the purposes of the action, and*
- (d) they comply with the conditions as further detailed in the annotations to the H2020 grant agreements.*

E. Indirect costs

Indirect costs are eligible if they are declared on the basis of the flat-rate of 25% of the eligible direct costs (see Article 5.2 and Points A to D above), from which are excluded:

- (a) costs of subcontracting and
- (b) costs of in-kind contributions provided by third parties which are not used on the beneficiary's premises;
- (c) *not applicable;*
- (d) *not applicable.*

Beneficiaries receiving an operating grant⁵ financed by the EU or Euratom budget cannot declare indirect costs for the period covered by the operating grant.

³ 'Large research infrastructure' means research infrastructure of a total value of at least EUR 20 million, for a beneficiary, calculated as the sum of historical asset values of each individual research infrastructure of that beneficiary, as they appear in its last closed balance sheet before the date of the signature of the Agreement or as determined on the basis of the rental and leasing costs of the research infrastructure.

⁴ For the definition, see Article 2(6) of Regulation (EU) No 1291/2013 of the European Parliament and of the Council of 11 December 2013 establishing Horizon 2020 - the Framework Programme for Research and Innovation (2014-2020) (OJ L 347, 20.12.2013 p.104)-('Horizon 2020 Framework Programme Regulation No 1291/2013'): 'Research infrastructure' are facilities, resources and services that are used by the research communities to conduct research and foster innovation in their fields. Where relevant, they may be used beyond research, e.g. for education or public services. They include: major scientific equipment (or sets of instruments); knowledge-based resources such as collections, archives or scientific data; e-infrastructures such as data and computing systems and communication networks; and any other infrastructure of a unique nature essential to achieve excellence in research and innovation. Such infrastructures may be 'single-sited', 'virtual' or 'distributed'.

⁵ For the definition, see Article 121(1)(b) of Regulation (EU, Euratom) No 966/2012 of the European Parliament and of the Council of 25 October 2012 on the financial rules applicable to the general budget of the Union and repealing Council Regulation (EC, Euratom) No 1605/2002 (OJ L 218, 26.10.2012, p.1) ('Financial Regulation No 966/2012'): 'operating grant' means direct financial contribution, by way of donation, from the budget in order to finance the functioning of a body which pursues an aim of general EU interest or has an objective forming part of and supporting an EU policy.

F. Specific cost category(ies)

Not applicable

6.3 Conditions for costs of linked third parties to be eligible

not applicable

6.4 Conditions for in-kind contributions provided by third parties free of charge to be eligible

In-kind contributions provided free of charge are eligible direct costs (for the beneficiary), if the costs incurred by the third party fulfil — *mutatis mutandis* — the general and specific conditions for eligibility set out in this Article (Article 6.1 and 6.2) and Article 12.1.

6.5 Ineligible costs

‘Ineligible costs’ are:

(a) costs that do not comply with the conditions set out above (Article 6.1 to 6.4), in particular:

- (i) costs related to return on capital;
- (ii) debt and debt service charges;
- (iii) provisions for future losses or debts;
- (iv) interest owed;
- (v) doubtful debts;
- (vi) currency exchange losses;
- (vii) bank costs charged by the beneficiary’s bank for transfers from the *Agency*;
- (viii) excessive or reckless expenditure;
- (ix) deductible VAT;
- (x) costs incurred during suspension of the implementation of the action (see Article 49);

(b) costs declared under another EU or Euratom grant (including grants awarded by a Member State and financed by the EU or Euratom budget and grants awarded by bodies other than the *Agency* for the purpose of implementing the EU or Euratom budget); in particular, indirect costs if the beneficiary is already receiving an operating grant financed by the EU or Euratom budget in the same period.

6.6 Consequences of declaration of ineligible costs

Declared costs that are ineligible will be rejected (see Article 42).

This may also lead to any of the other measures described in Chapter 6.

CHAPTER 4 RIGHTS AND OBLIGATIONS OF THE PARTIES

SECTION 1 RIGHTS AND OBLIGATIONS RELATED TO IMPLEMENTING THE ACTION

ARTICLE 7 — GENERAL OBLIGATION TO PROPERLY IMPLEMENT THE ACTION

7.1 General obligation to properly implement the action

The beneficiaries must implement the action as described in Annex 1 and in compliance with the provisions of the Agreement and all legal obligations under applicable EU, international and national law.

7.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 8 — RESOURCES TO IMPLEMENT THE ACTION — THIRD PARTIES INVOLVED IN THE ACTION

The beneficiaries must have the appropriate resources to implement the action.

If it is necessary to implement the action, the beneficiaries may:

- purchase goods, works and services (see Article 10);
- use in-kind contributions provided by third parties against payment (see Article 11);
- use in-kind contributions provided by third parties free of charge (see Article 12);
- call upon subcontractors to implement action tasks described in Annex 1 (see Article 13);
- call upon linked third parties to implement action tasks described in Annex 1 (see Article 14).

In these cases, the beneficiaries retain sole responsibility towards the *Agency* and the other beneficiaries for implementing the action.

ARTICLE 9 — IMPLEMENTATION OF ACTION TASKS BY BENEFICIARIES NOT RECEIVING EU FUNDING

Not applicable

ARTICLE 10 — PURCHASE OF GOODS, WORKS OR SERVICES

10.1 Rules for purchasing goods, works or services

10.1.1 If necessary to implement the action, the beneficiaries may purchase goods, works or services.

The beneficiaries must make such purchases ensuring the best value for money or, if appropriate, the lowest price. In doing so, they must avoid any conflict of interests (see Article 35).

The beneficiaries must ensure that *the Agency*, the Commission, the European Court of Auditors (ECA) and the European Anti-Fraud Office (OLAF) can exercise their rights under Articles 22 and 23 also towards their contractors.

10.1.2 Beneficiaries that are ‘contracting authorities’ within the meaning of Directive 2004/18/EC⁶ or ‘contracting entities’ within the meaning of Directive 2004/17/EC⁷ must comply with the applicable national law on public procurement.

10.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under Article 10.1.1, the costs related to the contract concerned will be ineligible (see Article 6) and will be rejected (see Article 42).

If a beneficiary breaches any of its obligations under Article 10.1.2, the grant may be reduced (see Article 43).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 11 — USE OF IN-KIND CONTRIBUTIONS PROVIDED BY THIRD PARTIES AGAINST PAYMENT

11.1 Rules for the use of in-kind contributions against payment

If necessary to implement the action, the beneficiaries may use in-kind contributions provided by third parties against payment.

The beneficiaries may declare costs related to the payment of in-kind contributions as eligible (see Article 6.1 and 6.2), up to the third parties’ costs for the seconded persons, contributed equipment, infrastructure or other assets or other contributed goods and services.

The third parties and their contributions must be set out in Annex 1. The *Agency* may however approve in-kind contributions not set out in Annex 1 without amendment (see Article 55), if:

- they are specifically justified in the periodic technical report and
- their use does not entail changes to the Agreement which would call into question the decision awarding the grant or breach the principle of equal treatment of applicants.

The beneficiaries must ensure that *the Agency*, the Commission, the European Court of Auditors (ECA) and the European Anti-Fraud Office (OLAF) can exercise their rights under Articles 22 and 23 also towards the third parties.

⁶ Directive 2004/18/EC of the European Parliament and of the Council of 31 March 2004 on the coordination of procedures for the award of public work contracts, public supply contracts and public service contracts (OJ L 134, 30.04.2004, p. 114).

⁷ Directive 2004/17/EC of the European Parliament and of the Council of 31 March 2004 coordinating the procurement procedures of entities operating in the water, energy, transport and postal services sectors (OJ L 134, 30.04.2004, p. 1).

11.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the costs related to the payment of the in-kind contribution will be ineligible (see Article 6) and will be rejected (see Article 42).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 12 — USE OF IN-KIND CONTRIBUTIONS PROVIDED BY THIRD PARTIES FREE OF CHARGE

12.1 Rules for the use of in-kind contributions free of charge

If necessary to implement the action, the beneficiaries may use in-kind contributions provided by third parties free of charge.

The beneficiaries may declare costs incurred by the third parties for the seconded persons, contributed equipment, infrastructure or other assets or other contributed goods and services as eligible in accordance with Article 6.4.

The third parties and their contributions must be set out in Annex 1. The *Agency* may however approve in-kind contributions not set out in Annex 1 without amendment (see Article 55), if:

- they are specifically justified in the periodic technical report and
- their use does not entail changes to the Agreement which would call into question the decision awarding the grant or breach the principle of equal treatment of applicants.

The beneficiaries must ensure that *the Agency*, the Commission, the European Court of Auditors (ECA) and the European Anti-Fraud Office (OLAF) can exercise their rights under Articles 22 and 23 also towards the third parties.

12.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the costs incurred by the third parties related to the in-kind contribution will be ineligible (see Article 6) and will be rejected (see Article 42).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 13 — IMPLEMENTATION OF ACTION TASKS BY SUBCONTRACTORS

13.1 Rules for subcontracting action tasks

13.1.1 If necessary to implement the action, the beneficiaries may award subcontracts covering the implementation of certain action tasks described in Annex 1.

Subcontracting may cover only a limited part of the action.

The beneficiaries must award the subcontracts ensuring the best value for money or, if appropriate, the lowest price. In doing so, they must avoid any conflict of interests (see Article 35).

The tasks to be implemented and the estimated cost for each subcontract must be set out in Annex 1 and the total estimated costs of subcontracting per beneficiary must be set out in Annex 2. The

Agency may however approve subcontracts not set out in Annex 1 and 2 without amendment (see Article 55), if:

- they are specifically justified in the periodic technical report and
- they do not entail changes to the Agreement which would call into question the decision awarding the grant or breach the principle of equal treatment of applicants.

The beneficiaries must ensure that *the Agency*, the Commission, the European Court of Auditors (ECA) and the European Anti-Fraud Office (OLAF) can exercise their rights under Articles 22 and 23 also towards their subcontractors.

13.1.2 The beneficiaries must ensure that their obligations under Articles 35, 36, 38 and 46 also apply to the subcontractors.

Beneficiaries that are ‘contracting authorities’ within the meaning of Directive 2004/18/EC or ‘contracting entities’ within the meaning of Directive 2004/17/EC must comply with the applicable national law on public procurement.

13.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under Article 13.1.1, the costs related to the subcontract concerned will be ineligible (see Article 6) and will be rejected (see Article 42).

If a beneficiary breaches any of its obligations under Article 13.1.2, the grant may be reduced (see Article 43).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 14 — IMPLEMENTATION OF ACTION TASKS BY LINKED THIRD PARTIES

Not applicable

ARTICLE 15 — FINANCIAL SUPPORT TO THIRD PARTIES

15.1 Rules for providing financial support to third parties

Not applicable

15.2 Financial support in the form of prizes

Not applicable

15.3 Consequences of non-compliance

Not applicable

ARTICLE 16 — PROVISION OF TRANS-NATIONAL OR VIRTUAL ACCESS TO RESEARCH INFRASTRUCTURE

16.1 Rules for providing trans-national access to research infrastructure

Not applicable

16.2 Rules for providing virtual access to research infrastructure

Not applicable

16.3 Consequences of non-compliance

Not applicable

SECTION 2 RIGHTS AND OBLIGATIONS RELATED TO THE GRANT ADMINISTRATION

ARTICLE 17 — GENERAL OBLIGATION TO INFORM

17.1 General obligation to provide information upon request

The beneficiaries must provide — during implementation of the action or afterwards and in accordance with Article 41.2 — any information requested in order to verify eligibility of the costs, proper implementation of the action and compliance with any other obligation under the Agreement.

17.2 Obligation to keep information up to date and to inform about events and circumstances likely to affect the Agreement

Each beneficiary must keep information stored in the 'Beneficiary Register' (via the electronic exchange system; see Article 52) up to date, in particular, its name, address, legal representatives, legal form and organisation type.

Each beneficiary must immediately inform the coordinator — which must immediately inform the Agency and the other beneficiaries — of any of the following:

- (a) **events** which are likely to affect significantly or delay the implementation of the action or the EU's financial interests, in particular:
 - (i) changes in its legal, financial, technical, organisational or ownership situation
- (b) **circumstances** affecting:
 - (i) the decision to award the grant or
 - (ii) compliance with requirements under the Agreement.

17.3 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 18 — KEEPING RECORDS — SUPPORTING DOCUMENTATION

18.1 Obligation to keep records and other supporting documentation

The beneficiaries must — for a period of *five* years after the payment of the balance — keep records and other supporting documentation in order to prove the proper implementation of the action and the costs they declare as eligible.

They must make them available upon request (see Article 17) or in the context of checks, reviews, audits or investigations (see Article 22).

If there are on-going checks, reviews, audits, investigations, litigation or other pursuits of claims under the Agreement (including the extension of findings; see Articles 22), the beneficiaries must keep the records and other supporting documentation until the end of these procedures.

The beneficiaries must keep the original documents. Digital and digitalised documents are considered originals if they are authorised by the applicable national law. The *Agency* may accept non-original documents if it considers that they offer a comparable level of assurance.

18.1.1 Records and other supporting documentation on the scientific and technical implementation

The beneficiaries must keep records and other supporting documentation on scientific and technical implementation of the action in line with the accepted standards in the respective field.

18.1.2 Records and other documentation to support the costs declared

The beneficiaries must keep the records and documentation supporting the costs declared, in particular the following:

- (a) for **actual costs**: adequate records and other supporting documentation to prove the costs declared, such as contracts, subcontracts, invoices and accounting records. In addition, the beneficiaries' usual cost accounting practices and internal control procedures must enable direct reconciliation between the amounts declared, the amounts recorded in their accounts and the amounts stated in the supporting documentation;
- (b) for **unit costs**: adequate records and other supporting documentation to prove the number of units declared. Beneficiaries do not need to identify the actual eligible costs covered or to keep or provide supporting documentation (such as accounting statements) to prove the amount per unit.

In addition, for direct personnel costs declared as unit costs calculated in accordance with the beneficiary's usual cost accounting practices, the beneficiaries must keep adequate

records and documentation to prove that the cost accounting practices used comply with the conditions set out in Article 6.2, Point A.

The beneficiaries may submit to the Commission, for approval, a certificate (drawn up in accordance with Annex 6) stating that their usual cost accounting practices comply with these conditions ('**certificate on the methodology**'). If the certificate is approved, costs declared in line with this methodology will not be challenged subsequently, unless the beneficiaries have concealed information for the purpose of the approval.

- (c) for **flat-rate costs**: adequate records and other supporting documentation to prove the eligibility of the costs to which the flat-rate is applied. The beneficiaries do not need to identify the costs covered or provide supporting documentation (such as accounting statements) to prove the amount declared at a flat-rate.

In addition, for **personnel costs** (declared as actual costs or on the basis of unit costs), the beneficiaries must keep **time records** for the number of hours declared. The time records must be in writing and approved by the persons working on the action and their supervisors, at least monthly. In the absence of reliable time records of the hours worked on the action, the *Agency* may accept alternative evidence supporting the number of hours declared, if it considers that it offers an adequate level of assurance.

As an exception, for **persons working exclusively on the action**, there is no need to keep time records, if the beneficiary signs a **declaration** confirming that the persons concerned have worked exclusively on the action.

18.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, costs insufficiently substantiated will be ineligible (see Article 6) and will be rejected (see Article 42), and the grant may be reduced (see Article 43).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 19 — SUBMISSION OF DELIVERABLES

19.1 Obligation to submit deliverables

The coordinator must submit the '**deliverables**' identified in Annex 1, in accordance with the timing and conditions set out in it.

19.2 Consequences of non-compliance

If the coordinator breaches any of its obligations under this Article, the *Agency* may apply any of the measures described in Chapter 6.

ARTICLE 20 — REPORTING — PAYMENT REQUESTS

20.1 Obligation to submit reports

The coordinator must submit to the *Agency* (see Article 52) the technical and financial reports set out in this Article. These reports include requests for payment and must be drawn up using the forms and templates provided in the electronic exchange system (see Article 52).

20.2 Reporting periods

The action is divided into the following ‘reporting periods’:

- RP1: from month 1 to month 18
- RP2: from month 19 to month 36
- RP3: from month 37 to month 48

20.3 Periodic reports — Requests for interim payments

The coordinator must submit a periodic report within 60 days following the end of each reporting period.

The periodic report must include the following:

(a) a ‘periodic technical report’ containing:

- (i) an **explanation of the work carried out** by the beneficiaries;
- (ii) an **overview of the progress** towards the objectives of the action, including milestones and deliverables identified in Annex 1.

This report must include explanations justifying the differences between work expected to be carried out in accordance with Annex 1 and that actually carried out.

The report must also detail the exploitation and dissemination of the results and — if required in Annex 1 — an updated ‘**plan for the exploitation and dissemination of the results**’;

- (iii) a **summary** for publication by the *Agency*;
- (iv) the answers to the ‘**questionnaire**’, covering issues related to the action implementation and the economic and societal impact, notably in the context of the Horizon 2020 key performance indicators and the Horizon 2020 monitoring requirements;

(b) a ‘periodic financial report’ containing:

- (i) an ‘**individual financial statement**’ (see Annex 4) from each beneficiary, for the reporting period concerned.

The individual financial statement must detail the eligible costs (actual costs, unit costs and flat-rate costs; see Article 6) for each budget category (see Annex 2).

The beneficiaries must declare all eligible costs, even if — for actual costs, unit costs and flat-rate costs — they exceed the amounts indicated in the estimated budget (see Annex 2). Amounts which are not declared in the individual financial statement will not be taken into account by the *Agency*.

If an individual financial statement is not submitted for a reporting period, it may be included in the periodic financial report for the next reporting period.

The individual financial statements of the last reporting period must also detail the **receipts of the action** (see Article 5.3.3).

Each beneficiary must **certify** that:

- the information provided is full, reliable and true;
 - the costs declared are eligible (see Article 6);
 - the costs can be substantiated by adequate records and supporting documentation (see Article 18) that will be produced upon request (see Article 17) or in the context of checks, reviews, audits and investigations (see Article 22), and
 - for the last reporting period: that all the receipts have been declared (see Article 5.3.3);
- (ii) an **explanation of the use of resources** and the information on subcontracting (see Article 13) and in-kind contributions provided by third parties (see Articles 11 and 12) from each beneficiary, for the reporting period concerned;
- (iii) *information on the amount of each interim payment and payment of the balance to be paid by the Agency to the Joint Research Centre (JRC);*
- (iv) a **'periodic summary financial statement'** (see Annex 4), created automatically by the electronic exchange system, consolidating the individual financial statements for the reporting period concerned and including — except for the last reporting period — the **request for interim payment**.

20.4 Final report — Request for payment of the balance

In addition to the periodic report for the last reporting period, the coordinator must submit the final report within 60 days following the end of the last reporting period.

The **final report** must include the following:

(a) a **'final technical report'** with a **summary** for publication containing:

- (i) an overview of the results and their exploitation and dissemination;
- (ii) the conclusions on the action, and
- (iii) the socio-economic impact of the action;

(b) a **'final financial report'** containing:

- (i) a **'final summary financial statement'** (see Annex 4), created automatically by the electronic-exchange system, consolidating the individual financial statements for all reporting periods and including the **request for payment of the balance** and

- (ii) a ‘**certificate on the financial statements**’ (drawn up in accordance with Annex 5) for each beneficiary, if it requests a total contribution of EUR 325 000 or more, as reimbursement of actual costs and unit costs calculated on the basis of its usual cost accounting practices (see Article 5.2 and Article 6.2, Point A).

20.5 Information on cumulative expenditure incurred

Not applicable

20.6 Currency for financial statements and conversion into euro

Financial statements must be drafted in euro.

Beneficiaries with accounting established in a currency other than the euro must convert the costs recorded in their accounts into euro, at the average of the daily exchange rates published in the C series of the *Official Journal of the European Union*, calculated over the corresponding reporting period.

If no daily euro exchange rate is published in the *Official Journal of the European Union* for the currency in question, they must be converted at the average of the monthly accounting rates published on the Commission’s website, calculated over the corresponding reporting period.

Beneficiaries with accounting established in euro must convert costs incurred in another currency into euro according to their usual accounting practices.

20.7 Language of reports

All reports (technical and financial reports, including financial statements) must be submitted in the language of the Agreement.

20.8 Consequences of non-compliance — Suspension of the payment deadline — Termination

If the reports submitted do not comply with this Article, the *Agency* may suspend the payment deadline (see Article 47) and apply any of the other measures described in Chapter 6.

If the coordinator breaches its obligation to submit the reports and if it fails to comply with this obligation within 30 days following a written reminder sent by the *Agency*, the Agreement may be terminated (see Article 50).

ARTICLE 21 — PAYMENTS AND PAYMENT ARRANGEMENTS

21.1 Payments to be made

The following payments will be made to the coordinator:

- one pre-financing payment;
- one or more interim payments, on the basis of the request(s) for interim payment (see Article 20), and
- one payment of the balance, on the basis of the request for payment of the balance (see Article 20).

21.2 Pre-financing payment — Amount — Amount retained for the Guarantee Fund

The aim of the pre-financing is to provide the beneficiaries with a float.

It remains the property of the *EU* until the payment of the balance.

The amount of the pre-financing payment will be EUR 2,205,509.04 (two million two hundred and five thousand five hundred and nine EURO and four eurocents).

The *Agency* will — except if Article 48 applies — make the pre-financing payment to the coordinator within 30 days either from the entry into force of the Agreement (see Article 58) or from 10 days before the starting date of the action (see Article 3), whichever is the latest.

An amount of EUR 254,481.81 (two hundred and fifty four thousand four hundred and eighty one EURO and eighty one eurocents), corresponding to 5% of the maximum grant amount (see Article 5.1), is retained by the *Agency* from the pre-financing payment and transferred into the 'Guarantee Fund'.

Moreover, the part of the pre-financing payment related to the Joint Research Centre (JRC) 184,239.25 (one hundred and eighty four thousand two hundred and thirty nine EURO and twenty five eurocents) is not paid to the coordinator, but kept by the Agency for the JRC.

21.3 Interim payments — Amount — Calculation

Interim payments reimburse the eligible costs incurred for the implementation of the action during the corresponding reporting periods.

The *Agency* will pay to the coordinator the amount due as interim payment within 90 days from receiving the periodic report (see Article 20.3), except if Articles 47 or 48 apply.

Payment is subject to the approval of the periodic report. Its approval does not imply recognition of the compliance, authenticity, completeness or correctness of its content.

The amount due as interim payment is calculated by the *Agency* in the following steps:

Step 1 – Application of the reimbursement rates

Step 2 – Limit to 90% of the maximum grant amount

21.3.1 Step 1 — Application of the reimbursement rates

The reimbursement rate(s) (see Article 5.2) are applied to the eligible costs (actual costs, unit costs and flat-rate costs ; see Article 6) declared by the beneficiaries (see Article 20) and approved by the *Agency* (see above) for the concerned reporting period.

21.3.2 Step 2 — Limit to 90% of the maximum grant amount

The total amount of pre-financing and interim payments must not exceed 90% of the maximum grant amount set out in Article 5.1. The maximum amount for the interim payment will be calculated as follows:

{90% of the maximum grant amount (see Article 5.1)

minus

{pre-financing and previous interim payments}}.

21.4 Payment of the balance — Amount — Calculation — Release of the amount retained for the Guarantee Fund

The payment of the balance reimburses the remaining part of the eligible costs incurred by the beneficiaries for the implementation of the action.

If the total amount of earlier payments is greater than the final grant amount (see Article 5.3), the payment of the balance takes the form of a recovery (see Article 44).

If the total amount of earlier payments is lower than the final grant amount, the *Agency* will pay the balance within 90 days from receiving the final report (see Article 20.4), except if Articles 47 or 48 apply.

Payment is subject to the approval of the final report. Its approval does not imply recognition of the compliance, authenticity, completeness or correctness of its content.

The **amount due as the balance** is calculated by the *Agency* by deducting the total amount of pre-financing and interim payments (if any) already made, from the final grant amount determined in accordance with Article 5.3:

{final grant amount (see Article 5.3)

minus

{pre-financing and interim payments (if any) made}}.

At the payment of the balance, the amount retained for the Guarantee Fund (see above) will be released and:

- if the balance is positive: the amount released will be paid in full to the coordinator together with the amount due as the balance;
- if the balance is negative (payment of the balance taking the form of recovery): it will be deducted from the amount released (see Article 44.1.2). If the resulting amount:
 - is positive, it will be paid to the coordinator
 - is negative, it will be recovered.

The amount to be paid may however be offset — without the beneficiary's consent — against any other amount owed by the beneficiary to the *Agency*, the Commission or *another* executive agency (under the EU or Euratom budget), up to the maximum EU contribution indicated, for that beneficiary, in the estimated budget (see Annex 2).

21.5 Notification of amounts due

When making payments, the *Agency* will formally notify to the coordinator the amount due, specifying whether it concerns an interim payment or the payment of the balance.

For the payment of the balance, the notification will also specify the final grant amount.

In the case of reduction of the grant or recovery of undue amounts, the notification will be preceded by the contradictory procedure set out in Articles 43 and 44.

21.6 Currency for payments

The *Agency* will make all payments in euro.

21.7 Payments to the coordinator — Distribution to the beneficiaries

Payments will be made to the coordinator.

Payments to the coordinator will discharge the *Agency* from its payment obligation.

The coordinator must distribute the payments between the beneficiaries without unjustified delay.

Pre-financing may however be distributed only:

- (a) if the minimum number of beneficiaries set out in the call for proposals has acceded to the Agreement (see Article 56) and
- (b) to beneficiaries that have acceded to the Agreement (see Article 56).

21.8 Bank account for payments

All payments will be made to the following bank account:

Name of bank: ABN AMRO BANK N.V.
Address of branch: GUSTAV MAHLERLAAN 10 AMSTERDAM, Netherlands
Full name of the account holder: DELFT UNIVERSITY OF TECHNOLOGY
Full account number (including bank codes):
IBAN code: NL09ABNA0490188346

21.9 Costs of payment transfers

The cost of the payment transfers is borne as follows:

- the *Agency* bears the cost of transfers charged by its bank;
- the beneficiary bears the cost of transfers charged by its bank;
- the party causing a repetition of a transfer bears all costs of the repeated transfer.

21.10 Date of payment

Payments by the *Agency* are considered to have been carried out on the date when they are debited to its account.

21.11 Consequences of non-compliance

21.11.1 If the *Agency* does not pay within the payment deadlines (see above), the beneficiaries are entitled to **late-payment interest** at the rate applied by the European Central Bank (ECB) for its main refinancing operations in euros ('reference rate'), plus three and a half points. The reference rate is the rate in force on the first day of the month in which the payment deadline expires, as published in the C series of the *Official Journal of the European Union*.

If the late-payment interest is lower than or equal to EUR 200, it will be paid to the coordinator only upon request submitted within two months of receiving the late payment.

Late-payment interest is not due if all beneficiaries are EU Member States (including regional and local government authorities or other public bodies acting on behalf of a Member State for the purpose of this Agreement).

Suspension of the payment deadline or payments (see Articles 47 and 48) will not be considered as late payment.

Late-payment interest covers the period running from the day following the due date for payment (see above), up to and including the date of payment.

Late-payment interest is not considered for the purposes of calculating the final grant amount.

21.11.2 If the coordinator breaches any of its obligations under this Article, the grant may be reduced (see Article 43) and the Agreement or the participation of the coordinator may be terminated (see Article 50).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 22 — CHECKS, REVIEWS, AUDITS AND INVESTIGATIONS — EXTENSION OF FINDINGS

22.1 Checks, reviews and audits by the *Agency* and the Commission

22.1.1 Right to carry out checks

The *Agency* or the Commission will — during the implementation of the action or afterwards — check the proper implementation of the action and compliance with the obligations under the Agreement, including assessing deliverables and reports.

For this purpose the *Agency* or the Commission may be assisted by external persons or bodies.

The *Agency* or the Commission may also request additional information in accordance with Article 17. The *Agency* or the Commission may request beneficiaries to provide such information to it directly.

Information provided must be accurate, precise and complete and in the format requested, including electronic format.

22.1.2 Right to carry out reviews

The *Agency* or the Commission may — during the implementation of the action or afterwards — carry out reviews on the proper implementation of the action (including assessment of deliverables

and reports), compliance with the obligations under the Agreement and continued scientific or technological relevance of the action.

Reviews may be started **up to two years after the payment of the balance**. They will be formally notified to the coordinator or beneficiary concerned and will be considered to have started on the date of the formal notification.

If the review is carried out on a third party (see Articles 10 to 16), the beneficiary concerned must inform the third party.

The *Agency or the Commission* may carry out reviews directly (using its own staff) or indirectly (using external persons or bodies appointed to do so). It will inform the coordinator or beneficiary concerned of the identity of the external persons or bodies. They have the right to object to the appointment on grounds of commercial confidentiality.

The coordinator or beneficiary concerned must provide — within the deadline requested — any information and data in addition to deliverables and reports already submitted (including information on the use of resources). The *Agency or the Commission* may request beneficiaries to provide such information to it directly.

The coordinator or beneficiary concerned may be requested to participate in meetings, including with external experts.

For **on-the-spot** reviews, the beneficiaries must allow access to their sites and premises, including to external persons or bodies, and must ensure that information requested is readily available.

Information provided must be accurate, precise and complete and in the format requested, including electronic format.

On the basis of the review findings, a **'review report'** will be drawn up.

The *Agency or the Commission* will formally notify the review report to the coordinator or beneficiary concerned, which has 30 days to formally notify observations (**'contradictory review procedure'**).

Reviews (including review reports) are in the language of the Agreement.

22.1.3 Right to carry out audits

The *Agency or the Commission* may — during the implementation of the action or afterwards — carry out audits on the proper implementation of the action and compliance with the obligations under the Agreement.

Audits may be started **up to two years after the payment of the balance**. They will be formally notified to the coordinator or beneficiary concerned and will be considered to have started on the date of the formal notification.

If the audit is carried out on a third party (see Articles 10 to 16), the beneficiary concerned must inform the third party.

The *Agency or the Commission* may carry out audits directly (using its own staff) or indirectly (using external persons or bodies appointed to do so). It will inform the coordinator or beneficiary concerned

of the identity of the external persons or bodies. They have the right to object to the appointment on grounds of commercial confidentiality.

The coordinator or beneficiary concerned must provide — within the deadline requested — any information (including complete accounts, individual salary statements or other personal data) to verify compliance with the Agreement. The *Agency or the Commission* may request beneficiaries to provide such information to it directly.

For **on-the-spot** audits, the beneficiaries must allow access to their sites and premises, including to external persons or bodies, and must ensure that information requested is readily available.

Information provided must be accurate, precise and complete and in the format requested, including electronic format.

On the basis of the audit findings, a **'draft audit report'** will be drawn up.

The *Agency or the Commission* will formally notify the draft audit report to the coordinator or beneficiary concerned, which has 30 days to formally notify observations (**'contradictory audit procedure'**). This period may be extended by the *Agency or the Commission* in justified cases.

The **'final audit report'** will take into account observations by the coordinator or beneficiary concerned. The report will be formally notified to it.

Audits (including audit reports) are in the language of the Agreement.

The *Agency or the Commission* may also access the beneficiaries' statutory records for the periodical assessment of unit costs or flat-rate amounts.

22.2 Investigations by the European Anti-Fraud Office (OLAF)

Under Regulations No 883/2013¹⁵ and No 2185/96¹⁶ (and in accordance with their provisions and procedures), the European Anti-Fraud Office (OLAF) may — at any moment during implementation of the action or afterwards — carry out investigations, including on-the-spot checks and inspections, to establish whether there has been fraud, corruption or any other illegal activity affecting the financial interests of the EU.

22.3 Checks and audits by the European Court of Auditors (ECA)

Under Article 287 of the Treaty on the Functioning of the European Union (TFEU) and Article 161 of the Financial Regulation No 966/2012¹⁷, the European Court of Auditors (ECA) may — at any moment during implementation of the action or afterwards — carry out audits.

¹⁵ Regulation (EU, Euratom) No 883/2013 of the European Parliament and of the Council of 11 September 2013 concerning investigations conducted by the European Anti-Fraud Office (OLAF) and repealing Regulation (EC) No 1073/1999 of the European Parliament and of the Council and Council Regulation (Euratom) No 1074/1999 (OJ L 248, 18.09.2013, p. 1).

¹⁶ Council Regulation (Euratom, EC) No 2185/1996 of 11 November 1996 concerning on-the-spot checks and inspections carried out by the Commission in order to protect the European Communities' financial interests against fraud and other irregularities (OJ L 292, 15.11.1996, p. 2).

¹⁷ Regulation (EU, Euratom) No 966/2012 of the European Parliament and of the Council of 25 October 2012 on the financial rules applicable to the general budget of the Union and repealing Council Regulation (EC, Euratom) No 1605/2002 (OJ L 298, 26.10.2012, p. 1).

The ECA has the right of access for the purpose of checks and audits.

22.4 Checks, reviews, audits and investigations for international organisations

Not applicable

22.5 Consequences of findings in checks, reviews, audits and investigations — Extension of findings

22.5.1 Findings in this grant

Findings in checks, reviews, audits or investigations carried out in the context of this grant may lead to the rejection of ineligible costs (see Article 42), reduction of the grant (see Article 43), recovery of undue amounts (see Article 44) or to any of the other measures described in Chapter 6.

Rejection of costs or reduction of the grant after the payment of the balance will lead to a revised final grant amount (see Article 5.4).

Findings in checks, reviews, audits or investigations may lead to a request for amendment for the modification of Annex 1 (see Article 55).

Checks, reviews, audits or investigations that find systemic or recurrent errors, irregularities, fraud or breach of obligations may also lead to consequences in other EU or Euratom grants awarded under similar conditions (**'extension of findings from this grant to other grants'**).

Moreover, findings arising from an OLAF investigation may lead to criminal prosecution under national law.

22.5.2 Findings in other grants

The *Agency or the Commission* may extend findings from other grants to this grant (**'extension of findings from other grants to this grant'**), if:

- (a) the beneficiary concerned is found, in other EU or Euratom grants awarded under similar conditions, to have committed systemic or recurrent errors, irregularities, fraud or breach of obligations that have a material impact on this grant and
- (b) those findings are formally notified to the beneficiary concerned — together with the list of grants affected by the findings — no later than two years after the payment of the balance of this grant.

The extension of findings may lead to the rejection of costs (see Article 42), reduction of the grant (see Article 43), recovery of undue amounts (see Article 44), suspension of payments (see Article 48), suspension of the action implementation (see Article 49) or termination (see Article 50).

22.5.3 Procedure

The *Agency or the Commission* will formally notify the beneficiary concerned the systemic or recurrent errors and its intention to extend these audit findings, together with the list of grants affected.

22.5.3.1 If the findings concern **eligibility of costs**: the formal notification will include:

- (a) an invitation to submit observations on the list of grants affected by the findings;
- (b) the request to submit **revised financial statements** for all grants affected;
- (c) the **correction rate for extrapolation** established by the *Agency or the Commission* on the basis of the systemic or recurrent errors, to calculate the amounts to be rejected if the beneficiary concerned:
 - (i) considers that the submission of revised financial statements is not possible or practicable or
 - (ii) does not submit revised financial statements.

The beneficiary concerned has 90 days from receiving notification to submit observations, revised financial statements or to propose a duly substantiated **alternative correction method**. This period may be extended by the *Agency or the Commission* in justified cases.

The amounts to be rejected will be determined on the basis of the revised financial statements, subject to their approval.

If the *Agency or the Commission* does not receive any observations or revised financial statements, does not accept the observations or the proposed alternative correction method or does not approve the revised financial statements, it will formally notify the beneficiary concerned the application of the initially notified correction rate for extrapolation.

If the *Agency or the Commission* accepts the alternative correction method proposed by the beneficiary concerned, it will formally notify the application of the accepted alternative correction method.

22.5.3.2 If the findings concern improper implementation or a breach of another obligation: the formal notification will include:

- (a) an invitation to submit observations on the list of grants affected by the findings and
- (b) the flat-rate the *Agency or the Commission* intends to apply according to the principle of proportionality.

The beneficiary concerned has 90 days from receiving notification to submit observations or to propose a duly substantiated alternative flat-rate.

If the *Agency or the Commission* does not receive any observations or does not accept the observations or the proposed alternative flat-rate, it will formally notify the beneficiary concerned the application of the initially notified flat-rate.

If the *Agency or the Commission* accepts the alternative flat-rate proposed by the beneficiary concerned, it will formally notify the application of the accepted alternative flat-rate.

22.6 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, any insufficiently substantiated costs will be ineligible (see Article 6) and will be rejected (see Article 42).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 23 — EVALUATION OF THE IMPACT OF THE ACTION

23.1 Right to evaluate the impact of the action

The *Agency or the Commission* may carry out interim and final evaluations of the impact of the action measured against the objective of the *EU* programme.

Evaluations may be started during implementation of the action and up to *five* years after the payment of the balance. The evaluation is considered to start on the date of the formal notification to the coordinator or beneficiaries.

The *Agency or the Commission* may make these evaluations directly (using its own staff) or indirectly (using external bodies or persons it has authorised to do so).

The coordinator or beneficiaries must provide any information relevant to evaluate the impact of the action, including information in electronic format.

23.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the *Agency* may apply the measures described in Chapter 6.

SECTION 3 RIGHTS AND OBLIGATIONS RELATED TO BACKGROUND AND RESULTS

SUBSECTION 1 GENERAL

ARTICLE 23a — MANAGEMENT OF INTELLECTUAL PROPERTY

23a.1 Obligation to take measures to implement the Commission Recommendation on the management of intellectual property in knowledge transfer activities

Beneficiaries that are universities or other public research organisations must take measures to implement the principles set out in Points 1 and 2 of the Code of Practice annexed to the Commission Recommendation on the management of intellectual property in knowledge transfer activities¹⁸.

This does not change the obligations set out in Subsections 2 and 3 of this Section.

The beneficiaries must ensure that researchers and third parties involved in the action are aware of them.

23a.2 Consequences of non-compliance

If a beneficiary breaches its obligations under this Article, the *Agency* may apply any of the measures described in Chapter 6.

¹⁸ Commission Recommendation C (2008) 1329 of 10.4.2008 on the management of intellectual property in knowledge transfer activities and the Code of Practice for universities and other public research institutions attached to this recommendation.

SUBSECTION 2 RIGHTS AND OBLIGATIONS RELATED TO BACKGROUND

ARTICLE 24 — AGREEMENT ON BACKGROUND

24.1 Agreement on background

The beneficiaries must identify and agree (in writing) on the background for the action (**‘agreement on background’**).

‘Background’ means any data, know-how or information — whatever its form or nature (tangible or intangible), including any rights such as intellectual property rights — that:

- (a) is held by the beneficiaries before they acceded to the Agreement, and
- (b) is needed to implement the action or exploit the results.

24.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 25 — ACCESS RIGHTS TO BACKGROUND

25.1 Exercise of access rights — Waiving of access rights — No sub-licensing

To exercise access rights, this must first be requested in writing (**‘request for access’**).

‘Access rights’ means rights to use results or background under the terms and conditions laid down in this Agreement.

Waivers of access rights are not valid unless in writing.

Unless agreed otherwise, access rights do not include the right to sub-license.

25.2 Access rights for other beneficiaries, for implementing their own tasks under the action

The beneficiaries must give each other access — on a royalty-free basis — to background needed to implement their own tasks under the action, unless the beneficiary that holds the background has — before acceding to the Agreement —:

- (a) informed the other beneficiaries that access to its background is subject to legal restrictions or limits, including those imposed by the rights of third parties (including personnel), or
- (b) agreed with the other beneficiaries that access would not be on a royalty-free basis.

25.3 Access rights for other beneficiaries, for exploiting their own results

The beneficiaries must give each other access — under fair and reasonable conditions — to background needed for exploiting their own results, unless the beneficiary that holds the background has — before acceding to the Agreement — informed the other beneficiaries that access to its

background is subject to legal restrictions or limits, including those imposed by the rights of third parties (including personnel).

'Fair and reasonable conditions' means appropriate conditions, including possible financial terms or royalty-free conditions, taking into account the specific circumstances of the request for access, for example the actual or potential value of the results or background to which access is requested and/or the scope, duration or other characteristics of the exploitation envisaged.

Requests for access may be made — unless agreed otherwise — up to one year after the period set out in Article 3.

25.4 Access rights for affiliated entities

Unless otherwise agreed in the consortium agreement, access to background must also be given — under fair and reasonable conditions (see above; Article 25.3) and unless it is subject to legal restrictions or limits, including those imposed by the rights of third parties (including personnel) — to affiliated entities¹⁹ established in an EU Member State or **'associated country'**²⁰, if this is needed to exploit the results generated by the beneficiaries to which they are affiliated.

Unless agreed otherwise (see above; Article 25.1), the affiliated entity concerned must make the request directly to the beneficiary that holds the background.

Requests for access may be made — unless agreed otherwise — up to one year after the period set out in Article 3.

25.5 Access rights for third parties

Not applicable

25.6 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43).

Such breaches may also lead to any of the other measures described in Chapter 6.

¹⁹ For the definition, see Article 2.1(2) of the Rules for Participation Regulation No 1290/2013: **'affiliated entity'** means any legal entity that is under the direct or indirect control of a participant, or under the same direct or indirect control as the participant, or that is directly or indirectly controlling a participant.

'Control' may take any of the following forms:

- (a) the direct or indirect holding of more than 50% of the nominal value of the issued share capital in the legal entity concerned, or of a majority of the voting rights of the shareholders or associates of that entity;
- (b) the direct or indirect holding, in fact or in law, of decision-making powers in the legal entity concerned.

However the following relationships between legal entities shall not in themselves be deemed to constitute controlling relationships:

- (a) the same public investment corporation, institutional investor or venture-capital company has a direct or indirect holding of more than 50% of the nominal value of the issued share capital or a majority of voting rights of the shareholders or associates;
- (b) the legal entities concerned are owned or supervised by the same public body.

²⁰ For the definition, see Article 2.1(3) of the Rules for Participation Regulation No 1290/2013: **'associated country'** means a third country which is party to an international agreement with the Union, as identified in *Article 7 of Horizon 2020 Framework Programme Regulation No 1291/2013. Article 7 sets out the conditions for association of non-EU countries to Horizon 2020.*

SUBSECTION 3 RIGHTS AND OBLIGATIONS RELATED TO RESULTS

ARTICLE 26 — OWNERSHIP OF RESULTS

26.1 Ownership by the beneficiary that generates the results

Results are owned by the beneficiary that generates them.

‘Results’ means any (tangible or intangible) output of the action such as data, knowledge or information — whatever its form or nature, whether it can be protected or not — that is generated in the action, as well as any rights attached to it, including intellectual property rights.

26.2 Joint ownership by several beneficiaries

Two or more beneficiaries own results jointly if:

- (a) they have jointly generated them and
- (b) it is not possible to:
 - (i) establish the respective contribution of each beneficiary, or
 - (ii) separate them for the purpose of applying for, obtaining or maintaining their protection (see Article 27).

The joint owners must agree (in writing) on the allocation and terms of exercise of their joint ownership (‘joint ownership agreement’), to ensure compliance with their obligations under this Agreement.

Unless otherwise agreed in the joint ownership agreement, each joint owner may grant non-exclusive licences to third parties to exploit jointly-owned results (without any right to sub-license), if the other joint owners are given:

- (a) at least 45 days advance notice and
- (b) fair and reasonable compensation.

Once the results have been generated, joint owners may agree (in writing) to apply another regime than joint ownership (such as, for instance, transfer to a single owner (see Article 30) with access rights for the others).

26.3 Rights of third parties (including personnel)

If third parties (including personnel) may claim rights to the results, the beneficiary concerned must ensure that it complies with its obligations under the Agreement.

If a third party generates results, the beneficiary concerned must obtain all necessary rights (transfer, licences or other) from the third party, in order to be able to respect its obligations as if those results were generated by the beneficiary itself.

If obtaining the rights is impossible, the beneficiary must refrain from using the third party to generate the results.

26.4 Agency ownership, to protect results

26.4.1 *The Agency* may — with the consent of the beneficiary concerned — assume ownership of results to protect them, if a beneficiary intends — up to four years after the period set out in Article 3 — to disseminate its results without protecting them, except in any of the following cases:

- (a) the lack of protection is because protecting the results is not possible, reasonable or justified (given the circumstances);
- (b) the lack of protection is because there is a lack of potential for commercial or industrial exploitation, or
- (c) the beneficiary intends to transfer the results to another beneficiary or third party established in an EU Member State or associated country, which will protect them.

Before the results are disseminated and unless any of the cases above under Points (a), (b) or (c) applies, the beneficiary must formally notify the *Agency* and at the same time inform it of any reasons for refusing consent. The beneficiary may refuse consent only if it can show that its legitimate interests would suffer significant harm.

If the *Agency* decides to assume ownership, it will formally notify the beneficiary concerned within 45 days of receiving notification.

No dissemination relating to these results may before the end of this period or, if the *Agency* takes a positive decision, until it has taken the necessary steps to protect the results.

26.4.2 *The Agency* may — with the consent of the beneficiary concerned — assume ownership of results to protect them, if a beneficiary intends — up to four years after the period set out in Article 3 — to stop protecting them or not to seek an extension of protection, except in any of the following cases:

- (a) the protection is stopped because of a lack of potential for commercial or industrial exploitation;
- (b) an extension would not be justified given the circumstances.

A beneficiary that intends to stop protecting results or not seek an extension must — unless any of the cases above under Points (a) or (b) applies — formally notify the *Agency* at least 60 days before the protection lapses or its extension is no longer possible and at the same time inform it of any reasons for refusing consent. The beneficiary may refuse consent only if it can show that its legitimate interests would suffer significant harm.

If the *Agency* decides to assume ownership, it will formally notify the beneficiary concerned within 45 days of receiving notification.

26.5 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43).

Such breaches may also lead to the any of the other measures described in Chapter 6.

ARTICLE 27 — PROTECTION OF RESULTS — VISIBILITY OF EU FUNDING

27.1 Obligation to protect the results

Each beneficiary must examine the possibility of protecting its results and must adequately protect them — for an appropriate period and with appropriate territorial coverage — if:

- (a) the results can reasonably be expected to be commercially or industrially exploited and
- (b) protecting them is possible, reasonable and justified (given the circumstances).

When deciding on protection, the beneficiary must consider its own legitimate interests and the legitimate interests (especially commercial) of the other beneficiaries.

27.2 Agency ownership, to protect the results

If a beneficiary intends not to protect its results, to stop protecting them or not seek an extension of protection, *the Agency* may — under certain conditions (see Article 26.4) — assume ownership to ensure their (continued) protection.

27.3 Information on EU funding

Applications for protection of results (including patent applications) filed by or on behalf of a beneficiary must — unless the *Agency* requests or agrees otherwise or unless it is impossible — include the following:

“The project leading to this application has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 688920”.

27.4 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43).

Such a breach may also lead to any of the other measures described in Chapter 6.

ARTICLE 28 — EXPLOITATION OF RESULTS

28.1 Obligation to exploit the results

Each beneficiary must — up to four years after the period set out in Article 3 — take measures aiming to ensure ‘**exploitation**’ of its results (either directly or indirectly, in particular through transfer or licensing; see Article 30) by:

- (a) using them in further research activities (outside the action);
- (b) developing, creating or marketing a product or process;
- (c) creating and providing a service, or
- (d) using them in standardisation activities.

This does not change the security obligations in Article 37, which still apply.

28.2 Results that could contribute to European or international standards — Information on EU funding

If results are incorporated in a standard, the beneficiary concerned must — unless the *Agency* requests or agrees otherwise or unless it is impossible — ask the standardisation body to include the following statement in (information related to) the standard:

"Results incorporated in this standard received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 688920".

28.3 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced in accordance with Article 43.

Such a breach may also lead to any of the other measures described in Chapter 6.

ARTICLE 29 — DISSEMINATION OF RESULTS — OPEN ACCESS — VISIBILITY OF EU FUNDING

29.1 Obligation to disseminate results

Unless it goes against their legitimate interests, each beneficiary must — as soon as possible — 'disseminate' its results by disclosing them to the public by appropriate means (other than those resulting from protecting or exploiting the results), including in scientific publications (in any medium).

This does not change the obligation to protect results in Article 27, the confidentiality obligations in Article 36, the security obligations in Article 37 or the obligations to protect personal data in Article 39, all of which still apply.

A beneficiary that intends to disseminate its results must give advance notice to the other beneficiaries of — unless agreed otherwise — at least 45 days, together with sufficient information on the results it will disseminate.

Any other beneficiary may object within — unless agreed otherwise — 30 days of receiving notification, if it can show that its legitimate interests in relation to the results or background would be significantly harmed. In such cases, the dissemination may not take place unless appropriate steps are taken to safeguard these legitimate interests.

If a beneficiary intends not to protect its results, it may — under certain conditions (see Article 26.4.1) — need to formally notify the *Agency* before dissemination takes place.

29.2 Open access to scientific publications

Each beneficiary must ensure open access (free of charge online access for any user) to all peer-reviewed scientific publications relating to its results.

In particular, it must:

- (a) as soon as possible and at the latest on publication, deposit a machine-readable electronic copy of the published version or final peer-reviewed manuscript accepted for publication in a repository for scientific publications;

Moreover, the beneficiary must aim to deposit at the same time the research data needed to validate the results presented in the deposited scientific publications.

- (b) ensure open access to the deposited publication — via the repository — at the latest:

- (i) on publication, if an electronic version is available for free via the publisher, or
- (ii) within six months of publication (twelve months for publications in the social sciences and humanities) in any other case.

- (c) ensure open access — via the repository — to the bibliographic metadata that identify the deposited publication.

The bibliographic metadata must be in a standard format and must include all of the following:

- the terms “*European Union (EU)*” and “*Horizon 2020*”;
- the name of the action, acronym and grant number;
- the publication date, and length of embargo period if applicable, and
- a persistent identifier.

29.3 Open access to research data

Regarding the digital research data generated in the action ('data'), the beneficiaries must:

- (a) *deposit in a research data repository and take measures to make it possible for third parties to access, mine, exploit, reproduce and disseminate — free of charge for any user — the following:*
 - (i) *the data, including associated metadata, needed to validate the results presented in scientific publications as soon as possible;*
 - (ii) *other data, including associated metadata, as specified and within the deadlines laid down in the 'data management plan' (see Annex 1);*
- (b) *provide information — via the repository — about tools and instruments at the disposal of the beneficiaries and necessary for validating the results (and — where possible — provide the tools and instruments themselves).*

This does not change the obligation to protect results in Article 27, the confidentiality obligations in Article 36, the security obligations in Article 37 or the obligations to protect personal data in Article 39, all of which still apply.

As an exception, the beneficiaries do not have to ensure open access to specific parts of their research data if the achievement of the action's main objective, as described in Annex 1, would be jeopardised by

making those specific parts of the research data openly accessible. In this case, the data management plan must contain the reasons for not giving access.

29.4 Information on EU funding — Obligation and right to use the EU emblem

Unless the *Agency* requests or agrees otherwise or unless it is impossible, any dissemination of results (in any form, including electronic) must:

(a) display the EU emblem and

(b) include the following text:

"This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 688920".

When displayed together with another logo, the EU emblem must have appropriate prominence.

For the purposes of their obligations under this Article, the beneficiaries may use the EU emblem without first obtaining approval from the *Agency*.

This does not however give them the right to exclusive use.

Moreover, they may not appropriate the EU emblem or any similar trademark or logo, either by registration or by any other means.

29.5 Disclaimer excluding *Agency* responsibility

Any dissemination of results must indicate that it reflects only the author's view and that the *Agency* is not responsible for any use that may be made of the information it contains.

29.6 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43).

Such a breach may also lead to any of the other measures described in Chapter 6.

ARTICLE 30 — TRANSFER AND LICENSING OF RESULTS

30.1 Transfer of ownership

Each beneficiary may transfer ownership of its results.

It must however ensure that its obligations under Articles 26.2, 26.4, 27, 28, 29, 30 and 31 also apply to the new owner and that this owner has the obligation to pass them on in any subsequent transfer.

This does not change the security obligations in Article 37, which still apply.

Unless agreed otherwise (in writing) for specifically-identified third parties or unless impossible under applicable EU and national laws on mergers and acquisitions, a beneficiary that intends to transfer ownership of results must give at least 45 days advance notice (or less if agreed in writing) to the other beneficiaries that still have (or still may request) access rights to the results. This notification

must include sufficient information on the new owner to enable any beneficiary concerned to assess the effects on its access rights.

Unless agreed otherwise (in writing) for specifically-identified third parties, any other beneficiary may object within 30 days of receiving notification (or less if agreed in writing), if it can show that the transfer would adversely affect its access rights. In this case, the transfer may not take place until agreement has been reached between the beneficiaries concerned.

30.2 Granting licenses

Each beneficiary may grant licences to its results (or otherwise give the right to exploit them), if:

- (a) this does not impede the rights under Article 31 and
- (b) *not applicable*.

In addition to Points (a) and (b), exclusive licences for results may be granted only if all the other beneficiaries concerned have waived their access rights (see Article 31.1).

This does not change the dissemination obligations in Article 29 or security obligations in Article 37, which still apply.

30.3 Agency right to object to transfers or licensing

Not applicable

30.4 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43).

Such a breach may also lead to any of the other measures described in Chapter 6.

ARTICLE 31 — ACCESS RIGHTS TO RESULTS

31.1 Exercise of access rights — Waiving of access rights — No sub-licensing

The conditions set out in Article 25.1 apply.

The obligations set out in this Article do not change the security obligations in Article 37, which still apply.

31.2 Access rights for other beneficiaries, for implementing their own tasks under the action

The beneficiaries must give each other access — on a royalty-free basis — to results needed for implementing their own tasks under the action.

31.3 Access rights for other beneficiaries, for exploiting their own results

The beneficiaries must give each other — under fair and reasonable conditions (see Article 25.3) — access to results needed for exploiting their own results.

Requests for access may be made — unless agreed otherwise — up to one year after the period set out in Article 3.

31.4 Access rights of affiliated entities

Unless agreed otherwise in the consortium agreement, access to results must also be given — under fair and reasonable conditions (Article 25.3) — to affiliated entities established in an EU Member State or associated country, if this is needed for those entities to exploit the results generated by the beneficiaries to which they are affiliated.

Unless agreed otherwise (see above; Article 31.1), the affiliated entity concerned must make any such request directly to the beneficiary that owns the results.

Requests for access may be made — unless agreed otherwise — up to one year after the period set out in Article 3.

31.5 Access rights for the EU institutions, bodies, offices or agencies and EU Member States

The beneficiaries must give access to their results — on a royalty-free basis — to EU institutions, bodies, offices or agencies, for developing, implementing or monitoring EU policies or programmes.

Such access rights are limited to non-commercial and non-competitive use.

This does not change the right to use any material, document or information received from the beneficiaries for communication and publicising activities (see Article 38.2).

31.6 Access rights for third parties

Not applicable

31.7 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43).

Such breaches may also lead to any of the other measures described in Chapter 6.

SECTION 4 OTHER RIGHTS AND OBLIGATIONS

ARTICLE 32 — RECRUITMENT AND WORKING CONDITIONS FOR RESEARCHERS

32.1 Obligation to take measures to implement the European Charter for Researchers and Code of Conduct for the Recruitment of Researchers

The beneficiaries must take all measures to implement the principles set out in the Commission Recommendation on the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers²², in particular regarding:

²² Commission Recommendation 2005/251/EC of 11 March 2005 on the European Charter for Researchers and on a Code of Conduct for the Recruitment of Researchers (OJ L 75, 22.3.2005, p. 67).

- working conditions;
- transparent recruitment processes based on merit, and
- career development.

The beneficiaries must ensure that researchers and third parties involved in the action are aware of them.

32.2 Consequences of non-compliance

If a beneficiary breaches its obligations under this Article, the *Agency* may apply any of the measures described in Chapter 6.

ARTICLE 33 — GENDER EQUALITY

33.1 Obligation to aim for gender equality

The beneficiaries must take all measures to promote equal opportunities between men and women in the implementation of the action. They must aim, to the extent possible, for a gender balance at all levels of personnel assigned to the action, including at supervisory and managerial level.

33.2 Consequences of non-compliance

If a beneficiary breaches its obligations under this Article, the *Agency* may apply any of the measures described in Chapter 6.

ARTICLE 34 — ETHICS

34.1 Obligation to comply with ethical principles

The beneficiaries must carry out the action in compliance with:

- (a) ethical principles (including the highest standards of research integrity — as set out, for instance, in the European Code of Conduct for Research Integrity²³ — and including, in particular, avoiding fabrication, falsification, plagiarism or other research misconduct) and
- (b) applicable international, EU and national law.

Funding will not be granted for activities carried out outside the EU if they are prohibited in all Member States.

The beneficiaries must ensure that the activities under the action have an exclusive focus on civil applications.

The beneficiaries must ensure that the activities under the action do not:

- (a) aim at human cloning for reproductive purposes;

²³ The European Code of Conduct for Research Integrity of ALLEA (All European Academies) and ESF (European Science Foundation) of March 2011.

http://www.esf.org/fileadmin/Public_documents/Publications/Code_Conduct_ResearchIntegrity.pdf

- (b) intend to modify the genetic heritage of human beings which could make such changes heritable (with the exception of research relating to cancer treatment of the gonads, which may be financed), or
- (c) intend to create human embryos solely for the purpose of research or for the purpose of stem cell procurement, including by means of somatic cell nuclear transfer.

34.2 Activities raising ethical issues

Activities raising ethical issues must comply with the 'ethics requirements' set out in Annex 1.

Before the beginning of an activity raising an ethical issue, the coordinator must submit (see Article 52) to the *Agency* copy of:

- (a) any ethics committee opinion required under national law and
- (b) any notification or authorisation for activities raising ethical issues required under national law.

If these documents are not in English, the coordinator must also submit an English summary of the submitted opinions, notifications and authorisations (containing, if available, the conclusions of the committee or authority concerned).

If these documents are specifically requested for the action, the request must contain an explicit reference to the action title. The coordinator must submit a declaration by each beneficiary concerned that all the submitted documents cover the action tasks.

34.3 Activities involving human embryos or human embryonic stem cells

Activities involving research on human embryos or human embryonic stem cells may be carried out only if:

- they are set out in Annex 1 or
- the coordinator has obtained explicit approval (in writing) from the *Agency* (see Article 52).

34.4 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43) and the Agreement or participation of the beneficiary may be terminated (see Article 50).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 35 — CONFLICT OF INTERESTS

35.1 Obligation to avoid a conflict of interests

The beneficiaries must take all measures to prevent any situation where the impartial and objective implementation of the action is compromised for reasons involving economic interest, political or national affinity, family or emotional ties or any other shared interest ('conflict of interests').

They must formally notify to the *Agency* without delay any situation constituting or likely to lead to a conflict of interests and immediately take all the necessary steps to rectify this situation.

The *Agency* may verify that the measures taken are appropriate and may require additional measures to be taken by a specified deadline.

35.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43) and the Agreement or participation of the beneficiary may be terminated (see Article 50).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 36 — CONFIDENTIALITY

36.1 General obligation to maintain confidentiality

During implementation of the action and for four years after the period set out in Article 3, the parties must keep confidential any data, documents or other material (in any form) that is identified as confidential at the time it is disclosed ('**confidential information**').

If a beneficiary requests, the *Agency* may agree to keep such information confidential for an additional period beyond the initial four years.

If information has been identified as confidential only orally, it will be considered to be confidential only if this is confirmed in writing within 15 days of the oral disclosure.

Unless otherwise agreed between the parties, they may use confidential information only to implement the Agreement.

The beneficiaries may disclose confidential information to their personnel or third parties involved in the action only if they:

- (a) need to know to implement the Agreement and
- (b) are bound by an obligation of confidentiality.

This does not change the security obligations in Article 37, which still apply.

The *Agency* may disclose confidential information to its staff, other EU institutions and bodies or third parties, if:

- (a) this is necessary to implement the Agreement or safeguard the EU's financial interests and
- (b) the recipients of the information are bound by an obligation of confidentiality.

Under the conditions set out in Article 4 of the Rules for Participation Regulation No 1290/2013²⁴, the Commission must moreover make available information on the results to other EU institutions, bodies, offices or agencies as well as Member States or associated countries.

The confidentiality obligations no longer apply if:

²⁴ Regulation (EU) No 1290/2013 of the European Parliament and of the Council of 11 December 2013 laying down the rules for participation and dissemination in "Horizon 2020 - the Framework Programme for Research and Innovation (2014-2020)" (OJ L 347, 20.12.2013 p.81).

- (a) the disclosing party agrees to release the other party;
- (b) the information was already known by the recipient or is given to him without obligation of confidentiality by a third party that was not bound by any obligation of confidentiality;
- (c) the recipient proves that the information was developed without the use of confidential information;
- (d) the information becomes generally and publicly available, without breaching any confidentiality obligation, or
- (e) the disclosure of the information is required by EU or national law.

36.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43).

Such breaches may also lead to any of the other measures described in Chapter 6.

ARTICLE 37 — SECURITY-RELATED OBLIGATIONS

37.1 Results with a security recommendation

Not applicable

37.2 Classified results

Not applicable

37.3 Activities involving dual-use goods or dangerous materials and substances

Not applicable

37.4 Consequences of non-compliance

Not applicable

ARTICLE 38 — PROMOTING THE ACTION — VISIBILITY OF EU FUNDING

38.1 Communication activities by beneficiaries

38.1.1 Obligation to promote the action and its results

The beneficiaries must promote the action and its results, by providing targeted information to multiple audiences (including the media and the public) in a strategic and effective manner.

This does not change the dissemination obligations in Article 29, the confidentiality obligations in Article 36 or the security obligations in Article 37, all of which still apply.

Before engaging in a communication activity expected to have a major media impact, the beneficiaries must inform the *Agency* (see Article 52).

38.1.2 Information on EU funding — Obligation and right to use the EU emblem

Unless the *Agency* requests or agrees otherwise or unless it is impossible, any communication activity related to the action (including in electronic form, via social media, etc.) and any infrastructure, equipment and major results funded by the grant must:

- (a) display the EU emblem and
- (b) include the following text:

For communication activities: *"This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 688920".*

For infrastructure, equipment and major results: *"This [infrastructure][equipment][insert type of result] is part of a project that has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 688920".*

When displayed together with another logo, the EU emblem must have appropriate prominence.

For the purposes of their obligations under this Article, the beneficiaries may use the EU emblem without first obtaining approval from the *Agency*.

This does not, however, give them the right to exclusive use.

Moreover, they may not appropriate the EU emblem or any similar trademark or logo, either by registration or by any other means.

38.1.3 Disclaimer excluding *Agency* responsibility

Any communication activity related to the action must indicate that it reflects only the author's view and that the *Agency* is not responsible for any use that may be made of the information it contains.

38.2 Communication activities by the *Agency*

38.2.1 Right to use beneficiaries' materials, documents or information

The *Agency* may use, for its communication and publicising activities, information relating to the action, documents notably summaries for publication and public deliverables as well as any other material, such as pictures or audio-visual material that it receives from any beneficiary (including in electronic form).

This does not change the confidentiality obligations in Article 36 and the security obligations in Article 37, all of which still apply.

However, if the *Agency's* use of these materials, documents or information would risk compromising legitimate interests, the beneficiary concerned may request the *Agency* not to use it (see Article 52).

The right to use a beneficiary's materials, documents and information includes:

- (a) **use for its own purposes** (in particular, making them available to persons working for the *Agency* or any other EU institution, body, office or agency or body or institutions in EU Member States; and copying or reproducing them in whole or in part, in unlimited numbers);

- (b) **distribution to the public** (in particular, publication as hard copies and in electronic or digital format, publication on the internet, as a downloadable or non-downloadable file, broadcasting by any channel, public display or presentation, communicating through press information services, or inclusion in widely accessible databases or indexes);
- (c) **editing or redrafting** for communication and publicising activities (including shortening, summarising, inserting other elements (such as meta-data, legends, other graphic, visual, audio or text elements), extracting parts (e.g. audio or video files), dividing into parts, use in a compilation);
- (d) **translation**;
- (e) **giving access in response to individual requests** under Regulation No 1049/2001²⁵, without the right to reproduce or exploit;
- (f) **storage** in paper, electronic or other form;
- (g) **archiving**, in line with applicable document-management rules, and
- (h) the right to authorise **third parties** to act on its behalf or sub-license the modes of use set out in Points (b),(c),(d) and (f) to third parties if needed for the communication and publicising activities of the *Agency*.

If the right of use is subject to rights of a third party (including personnel of the beneficiary), the beneficiary must ensure that it complies with its obligations under this Agreement (in particular, by obtaining the necessary approval from the third parties concerned).

Where applicable (and if provided by the beneficiaries), the *Agency* will insert the following information:

“© – [year] – [name of the copyright owner]. All rights reserved. Licensed to the *Executive Agency for Small and Medium-sized Enterprises (EASME)* under conditions.”

38.3 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43).

Such breaches may also lead to any of the other measures described in Chapter 6.

²⁵ Regulation (EC) No 1049/2001 of the European Parliament and of the Council of 30 May 2001 regarding public access to European Parliament, Council and Commission documents, OJ L 145, 31.5.2001, p. 43.

ARTICLE 39 — PROCESSING OF PERSONAL DATA

39.1 Processing of personal data by the *Agency and the Commission*

Any personal data under the Agreement will be processed by the *Agency or the Commission* under Regulation No 45/2001²⁶ and according to the ‘notifications of the processing operations’ to the Data Protection Officer (DPO) of the *Agency or the Commission* (publicly accessible in the DPO register).

Such data will be processed by the ‘data controller’ of the *Agency or the Commission* for the purposes of implementing, managing and monitoring the Agreement or protecting the financial interests of the EU or Euratom (including checks, reviews, audits and investigations; see Article 22).

The persons whose personal data are processed have the right to access and correct their own personal data. For this purpose, they must send any queries about the processing of their personal data to the data controller, via the contact point indicated in the ‘service specific privacy statement(s) (SSPS)’ that are published on the *Agency and the Commission* websites.

They also have the right to have recourse at any time to the European Data Protection Supervisor (EDPS).

39.2 Processing of personal data by the beneficiaries

The beneficiaries must process personal data under the Agreement in compliance with applicable EU and national law on data protection (including authorisations or notification requirements).

The beneficiaries may grant their personnel access only to data that is strictly necessary for implementing, managing and monitoring the Agreement.

The beneficiaries must inform the personnel whose personal data are collected and processed by the *Agency or the Commission*. For this purpose, they must provide them with the service specific privacy statement (SSPS) (see above), before transmitting their data to the *Agency or the Commission*.

39.3 Consequences of non-compliance

If a beneficiary breaches any of its obligations under Article 39.2, the *Agency* may apply any of the measures described in Chapter 6.

ARTICLE 40 — ASSIGNMENTS OF CLAIMS FOR PAYMENT AGAINST THE AGENCY

The beneficiaries may not assign any of their claims for payment against the *Agency* to any third party, except if approved by the *Agency* on the basis of a reasoned, written request by the coordinator (on behalf of the beneficiary concerned).

If the *Agency* has not accepted the assignment or the terms of it are not observed, the assignment will have no effect on it.

In no circumstances will an assignment release the beneficiaries from their obligations towards the *Agency*.

²⁶ Regulation (EC) No 45/2001 of the European Parliament and of the Council of 18 December 2000 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data (OJ L 8, 12.01.2001, p. 1).

CHAPTER 5 DIVISION OF BENEFICIARIES' ROLES AND RESPONSIBILITIES

ARTICLE 41 — DIVISION OF BENEFICIARIES' ROLES AND RESPONSIBILITIES — RELATIONSHIP WITH COMPLEMENTARY BENEFICIARIES — RELATIONSHIP WITH PARTNERS OF A JOINT ACTION

41.1 Roles and responsibilities towards the *Agency*

The beneficiaries have full responsibility for implementing the action and complying with the Agreement.

The beneficiaries are jointly and severally liable for the **technical implementation** of the action as described in Annex 1. If a beneficiary fails to implement its part of the action, the other beneficiaries become responsible for implementing this part (without being entitled to any additional EU funding for doing so), unless the *Agency* expressly relieves them of this obligation.

The **financial responsibility** of each beneficiary is governed by Articles 44, 45 and 46.

41.2 Internal division of roles and responsibilities

The internal roles and responsibilities of the beneficiaries are divided as follows:

(a) Each beneficiary must:

- (i) keep information stored in the 'Beneficiary Register' (via the electronic exchange system) up to date (see Article 17);
- (ii) inform the coordinator immediately of any events or circumstances likely to affect significantly or delay the implementation of the action (see Article 17);
- (iii) submit to the coordinator in good time:
 - individual financial statements for itself and, if required, certificates on the financial statements (see Article 20);
 - the data needed to draw up the technical reports (see Article 20);
 - ethics committee opinions and notifications or authorisations for activities raising ethical issues (see Article 34);
 - any other documents or information required by the *Agency or the Commission* under the Agreement, unless the Agreement requires the beneficiary to submit this information directly to the *Agency or the Commission*.

(b) The coordinator must:

- (i) monitor that the action is implemented properly (see Article 7);

- (ii) act as the intermediary for all communications between the beneficiaries and the *Agency* (in particular, providing the *Agency* with the information described in Article 17), unless the Agreement specifies otherwise;
- (iii) request and review any documents or information required by the *Agency* and verify their completeness and correctness before passing them on to the *Agency*;
- (iv) submit the deliverables and reports to the *Agency* (see Articles 19 and 20);
- (v) ensure that all payments are made to the other beneficiaries without unjustified delay (see Article 21);
- (vi) inform the *Agency* of the amounts paid to each beneficiary, when required under the Agreement (see Articles 44 and 50) or requested by the *Agency*.

The coordinator may not delegate the above-mentioned tasks to any other beneficiary or subcontract them to any third party.

41.3 Internal arrangements between beneficiaries — Consortium agreement

The beneficiaries must have internal arrangements regarding their operation and co-ordination to ensure that the action is implemented properly. These internal arrangements must be set out in a written 'consortium agreement' between the beneficiaries, which may cover:

- *internal organisation of the consortium;*
- *management of access to the electronic exchange system;*
- *distribution of EU funding;*
- *additional rules on rights and obligations related to background and results (including whether access rights remain or not, if a beneficiary is in breach of its obligations) (see Section 3 of Chapter 4);*
- *settlement of internal disputes;*
- *liability, indemnification and confidentiality arrangements between the beneficiaries.*

The consortium agreement must not contain any provision contrary to the Agreement.

41.4 Relationship with complementary beneficiaries — Collaboration agreement

Not applicable

41.5 Relationship with partners of a joint action — Coordination agreement

Not applicable

CHAPTER 6 REJECTION OF COSTS — REDUCTION OF THE GRANT — RECOVERY — PENALTIES — DAMAGES — SUSPENSION — TERMINATION — FORCE MAJEURE

SECTION 1 REJECTION OF COSTS — REDUCTION OF THE GRANT — RECOVERY — PENALTIES

ARTICLE 42 — REJECTION OF INELIGIBLE COSTS

42.1 Conditions

42.1.1 The *Agency* will — at the time of an **interim payment**, at the **payment of the balance** or **afterwards** — reject any costs which are ineligible (see Article 6), in particular following checks, reviews, audits or investigations (see Article 22).

42.1.2 The rejection may also be based on the **extension of findings from other grants to this grant**, under the conditions set out in Article 22.5.2.

42.2 Ineligible costs to be rejected — Calculation — Procedure

Ineligible costs will be rejected in full.

If the *Agency* rejects costs **without reduction of the grant** (see Article 43) or **recovery of undue amounts** (see Article 44), it will formally notify the coordinator or beneficiary concerned the rejection of costs, the amounts and the reasons why (if applicable, together with the notification of amounts due; see Article 21.5). The coordinator or beneficiary concerned may — within 30 days of receiving notification — formally notify the *Agency* of its disagreement and the reasons why.

If the *Agency* rejects costs **with reduction of the grant** or **recovery of undue amounts**, it will formally notify the rejection in the ‘**pre-information letter**’ on reduction or recovery set out in Articles 43 and 44.

42.3 Effects

If the *Agency* rejects costs at the time of an **interim payment** or the **payment of the balance**, it will deduct them from the total eligible costs declared, for the action, in the periodic or final summary financial statement (see Articles 20.3 and 20.4). It will then calculate the interim payment or payment of the balance as set out in Articles 21.3 or 21.4.

If the *Agency* — **after an interim payment but before the payment of the balance** — rejects costs declared in a periodic summary financial statement, it will deduct them from the total eligible costs declared, for the action, in the next periodic summary financial statement or in the final summary financial statement. It will then calculate the interim payment or payment of the balance as set out in Articles 21.3 or 21.4.

If the *Agency* rejects costs **after the payment of the balance**, it will deduct the amount rejected from the total eligible costs declared, by the beneficiary, in the final summary financial statement. It will then calculate the revised final grant amount as set out in Article 5.4.

ARTICLE 43 — REDUCTION OF THE GRANT

43.1 Conditions

43.1.1 The *Agency* may — **at the payment of the balance or afterwards** — reduce the maximum grant amount (see Article 5.1), if the action has not been implemented properly as described in Annex I or another obligation under the Agreement has been breached.

43.1.2 The *Agency* may also reduce the maximum grant amount on the basis of the **extension of findings from other grants to this grant**, under the conditions set out in Article 22.5.2.

43.2 Amount to be reduced — Calculation — Procedure

The amount of the reduction will be proportionate to the improper implementation of the action or to the seriousness of the breach.

Before reduction of the grant, the *Agency* will formally notify a ‘**pre-information letter**’ to the coordinator or beneficiary concerned:

- informing it of its intention to reduce the grant, the amount it intends to reduce and the reasons why and
- inviting it to submit observations within 30 days of receiving notification

If the *Agency* does not receive any observations or decides to pursue reduction despite the observations it has received, it will formally notify **confirmation** of the reduction (if applicable, together with the notification of amounts due; see Article 21).

43.3 Effects

If the *Agency* reduces the grant at the time of **the payment of the balance**, it will calculate the reduced grant amount for the action and then determine the amount due as payment of the balance (see Articles 5.3.4 and 21.4).

.... If the *Agency* reduces the grant **after the payment of the balance**, it will calculate the revised final grant amount for the beneficiary concerned (see Article 5.4). If the revised final grant amount for the beneficiary concerned is lower than its share of the final grant amount, the *Agency* will recover the difference (see Article 44).

ARTICLE 44 — RECOVERY OF UNDUE AMOUNTS

44.1 Amount to be recovered — Calculation — Procedure

The *Agency* will — **after termination of the participation of a beneficiary, at the payment of the balance or afterwards** — claim back any amount that was paid but is not due under the Agreement.

Each beneficiary’s financial responsibility in case of recovery is limited to its own debt, except for the amount retained for the Guarantee Fund (see Article 21.4).

44.1.1 Recovery after termination of a beneficiary’s participation

If recovery takes place after termination of a beneficiary's participation (including the coordinator), the *Agency* will claim back the undue amount from the beneficiary concerned, by formally notifying it a debit note (see Article 50.2 and 50.3). This note will specify the amount to be recovered, the terms and the date for payment.

If payment is not made by the date specified in the debit note, the *Agency or the Commission* will recover the amount:

- (a) by '**offsetting**' it — without the beneficiary's consent — against any amounts owed to the beneficiary concerned by the *Agency*, the Commission or another executive agency (from the EU or Euratom budget).

In exceptional circumstances, to safeguard the EU's financial interests, the *Agency* may offset before the payment date specified in the debit note;

- (b) *not applicable*;

- (c) by **taking legal action** (see Article 57) or by **adopting an enforceable decision** under Article 299 of the Treaty on the Functioning of the EU (TFEU) and Article 79(2) of the Financial regulation No 966/2012.

If payment is not made by the date specified in the debit note, the amount to be recovered (see above) will be increased by **late-payment interest** at the rate set out in Article 21.11, from the day following the payment date in the debit note, up to and including the date the *Agency or the Commission* receives full payment of the amount.

Partial payments will be first credited against expenses, charges and late-payment interest and then against the principal.

Bank charges incurred in the recovery process will be borne by the beneficiary, unless Directive 2007/64/EC²⁷ applies.

44.1.2 Recovery at payment of the balance

If the payment of the balance takes the form of a recovery (see Article 21.4), the *Agency* will formally notify a '**pre-information letter**' to the coordinator:

- informing it of its intention to recover, the amount due as the balance and the reasons why;
- specifying that it intends to deduct the amount to be recovered from the amount retained for the Guarantee Fund;
- requesting the coordinator to submit a report on the distribution of payments to the beneficiaries within 30 days of receiving notification, and
- inviting the coordinator to submit observations within 30 days of receiving notification.

²⁷ Directive 2007/64/EC of the European Parliament and of the Council of 13 November 2007 on payment services in the internal market amending Directives 97/7/EC, 2002/65/EC, 2005/60/EC and 2006/48/EC and repealing Directive 97/5/EC (OJ L 319, 05.12.2007, p. 1).

If no observations are submitted or the *Agency* decides to pursue recovery despite the observations it has received, it will **confirm recovery** (together with the notification of amounts due; see Article 21.5) and:

- pay the difference between the amount to be recovered and the amount retained for the Guarantee Fund, **if the difference is positive** or
- formally notify to the coordinator a **debit note** for the difference between the amount to be recovered and the amount retained for the Guarantee Fund, **if the difference is negative**. This note will also specify the terms and the date for payment.

If the coordinator does not repay the *Agency* by the date in the debit note and has not submitted the report on the distribution of payments: the *Agency* or the Commission will **recover** the amount set out in the debit note from the coordinator (see below).

If the coordinator does not repay the *Agency* by the date in the debit note, but has submitted the report on the distribution of payments: the *Agency* will:

- (a) identify the beneficiaries for which the amount calculated as follows is negative:

$\{ \{ \{ \text{beneficiary's costs declared in the final summary financial statement and approved by the } \}$
Agency multiplied by the reimbursement rate set out in Article 5.2 for the beneficiary concerned}

divided by

the EU contribution for the action calculated according to Article 5.3.1 }

multiplied by

the final grant amount (see Article 5.3)},

minus

{ pre-financing and interim payments received by the beneficiary} }.

- (b) formally notify to each beneficiary identified according to point (a) a **debit note** specifying the terms and date for payment. The amount of the debit note is calculated as follows:

$\{ \{ \text{amount calculated according to point (a) for the beneficiary concerned}$

divided by

the sum of the amounts calculated according to point (a) for all the beneficiaries identified according to point (a)}

multiplied by

the amount set out in the debit note formally notified to the coordinator}.

If payment is not made by the date specified in the debit note, the *Agency* will **recover** the amount:

- (a) by ‘offsetting’ it — without the beneficiary’s consent — against any amounts owed to the beneficiary concerned by the *Agency*, the Commission or another executive agency (from the EU or Euratom budget).

In exceptional circumstances, to safeguard the EU’s financial interests, the *Agency* may offset before the payment date specified in the debit note;

- (b) by **drawing on the Guarantee Fund**. The *Agency* or the Commission will formally notify the beneficiary concerned the debit note on behalf of the Guarantee Fund and recover the amount:

(i) *not applicable*;

- (ii) by **taking legal action** (see Article 57) or by **adopting an enforceable decision** under Article 299 of the Treaty on the Functioning of the EU (TFEU) and Article 79(2) of the Financial Regulation No 966/2012.

If payment is not made by the date in the debit note, the amount to be recovered (see above) will be increased by **late-payment interest** at the rate set out in Article 21.11, from the day following the payment date in the debit note, up to and including the date the *Agency* or the Commission receives full payment of the amount.

Partial payments will be first credited against expenses, charges and late-payment interest and then against the principal.

Bank charges incurred in the recovery process will be borne by the beneficiary, unless Directive 2007/64/EC applies.

44.1.3 Recovery of amounts after payment of the balance

If, for a beneficiary, the revised final grant amount (see Article 5.4) is lower than its share of the final grant amount, it must repay the difference to the *Agency*.

The beneficiary’s share of the final grant amount is calculated as follows:

{ { {beneficiary’s costs declared in the final summary financial statement and approved by the *Agency* multiplied by the reimbursement rate set out in Article 5.2 for the beneficiary concerned} }

divided by

the EU contribution for the action calculated according to Article 5.3.1 }

multiplied by

the final grant amount (see Article 5.3) }.

If the coordinator has not distributed amounts received (see Article 21.7), the *Agency* will also recover these amounts.

The *Agency* will formally notify a **pre-information letter** to the beneficiary concerned:

- informing it of its intention to recover, the due amount and the reasons why and

- inviting it to submit observations within 30 days of receiving notification.

If no observations are submitted or the *Agency* decides to pursue recovery despite the observations it has received, it will **confirm** the amount to be recovered and formally notify to the beneficiary concerned a **debit note**. This note will also specify the terms and the date for payment.

If payment is not made by the date specified in the debit note, the *Agency* will **recover** the amount:

- (a) by '**offsetting**' it — without the beneficiary's consent — against any amounts owed to the beneficiary concerned by the *Agency*, the Commission or another executive agency (from the EU or Euratom budget).

In exceptional circumstances, to safeguard the EU's financial interests, the *Agency* may offset before the payment date specified in the debit note;

- (b) by **drawing on the Guarantee Fund**. The *Agency* or the Commission will formally notify the beneficiary concerned the debit note on behalf of the Guarantee Fund and recover the amount:

- (i) *not applicable*;

- (ii) by **taking legal action** (see Article 57) or by **adopting an enforceable decision** under Article 299 of the Treaty on the Functioning of the EU (TFEU) and Article 79(2) of the Financial Regulation No 966/2012.

If payment is not made by the date in the debit note, the amount to be recovered (see above) will be increased by **late-payment interest** at the rate set out in Article 21.11, from the day following the date for payment in the debit note, up to and including the date the *Agency* or the Commission receives full payment of the amount.

Partial payments will be first credited against expenses, charges and late-payment interest and then against the principal.

Bank charges incurred in the recovery process will be borne by the beneficiary, unless Directive 2007/64/EC applies.

ARTICLE 45 — ADMINISTRATIVE AND FINANCIAL PENALTIES

45.1 Conditions

Under Articles 109 and 131(4) of the Financial Regulation No 966/2012, the *Agency* may impose **administrative and financial penalties** if a beneficiary:

- (a) has committed substantial errors, irregularities or fraud or is in serious breach of its obligations under the Agreement or
- (b) has made false declarations about information required under the Agreement or for the submission of the proposal (or has not supplied such information).

Each beneficiary is responsible for paying the financial penalties imposed on it.

Under Article 109(3) of the Financial Regulation No 966/2012, the *Agency or the Commission* may — under certain conditions and limits — publish decisions imposing administrative or financial penalties.

45.2 Duration — Amount of penalty — Calculation

Administrative penalties exclude the beneficiary from all contracts and grants financed from the EU or Euratom budget for a maximum of five years from the date the infringement is established by the *Agency*.

If the beneficiary commits another infringement within five years of the date the first infringement is established, the *Agency* may extend the exclusion period up to 10 years.

Financial penalties will be between 2% and 10% of the maximum EU contribution indicated, for the beneficiary concerned, in the estimated budget (see Annex 2).

If the beneficiary commits another infringement within five years of the date the first infringement is established, the *Agency* may increase the rate of financial penalties to between 4% and 20%.

45.3 Procedure

Before applying a penalty, the *Agency* will formally notify the beneficiary concerned:

- informing it of its intention to impose a penalty, its duration or amount and the reasons why and
- inviting it to submit observations within 30 days.

If the *Agency* does not receive any observations or decides to impose the penalty despite of observations it has received, it will formally notify **confirmation** of the penalty to the beneficiary concerned and — in case of financial penalties — deduct the penalty from the payment of the balance or formally notify a **debit note**, specifying the amount to be recovered, the terms and the date for payment.

If payment is not made by the date specified in the debit note, the *Agency or the Commission* may recover the amount:

- (a) by '**offsetting**' it — without the beneficiary's consent — against any amounts owed to the beneficiary concerned by the *Agency*, the Commission or another executive agency (from the EU or Euratom budget).

In exceptional circumstances, to safeguard the EU's financial interests, the *Agency* may offset before the payment date specified in the debit note;

- (b) by **taking legal action** (see Article 57) or by **adopting an enforceable decision** under Article 299 of the Treaty on the Functioning of the EU (TFEU) and Article 79(2) of the Financial Regulation No 966/2012.

If payment is not made by the date in the debit note, the amount to be recovered (see above) will be increased by **late-payment interest** at the rate set out in Article 21.11, from the day following the payment date in the debit note, up to and including the date the *Agency or the Commission* receives full payment of the amount.

Partial payments will be first credited against expenses, charges and late-payment interest and then against the principal.

Bank charges incurred in the recovery process will be borne by the beneficiary, unless Directive 2007/64/EC applies.

SECTION 2 LIABILITY FOR DAMAGES

ARTICLE 46 — LIABILITY FOR DAMAGES

46.1 Liability of the *Agency*

The *Agency* cannot be held liable for any damage caused to the beneficiaries or to third parties as a consequence of implementing the Agreement, including for gross negligence.

The *Agency* cannot be held liable for any damage caused by any of the beneficiaries or third parties involved in the action, as a consequence of implementing the Agreement.

46.2 Liability of the beneficiaries

46.2.1 Conditions

Except in case of force majeure (see Article 51), the beneficiaries must compensate the *Agency* for any damage it sustains as a result of the implementation of the action or because the action was not implemented in full compliance with the Agreement.

Each beneficiary is responsible for paying the damages claimed from it.

46.2.2 Amount of damages - Calculation

The amount the *Agency* can claim from a beneficiary will correspond to the damage caused by that beneficiary.

46.2.3 Procedure

Before claiming damages, the *Agency* will formally notify the beneficiary concerned:

- informing it of its intention to claim damages, the amount and the reasons why and
- inviting it to submit observations within 30 days.

If the *Agency* does not receive any observations or decides to claim damages despite the observations it has received, it will formally notify **confirmation** of the claim for damages and a **debit note**, specifying the amount to be recovered, the terms and the date for payment.

If payment is not made by the date specified in the debit note, the *Agency or the Commission* may recover the amount:

- (a) by ‘**offsetting**’ it — without the beneficiary’s consent — against any amounts owed to the beneficiary concerned by the *Agency, the Commission* or *another* executive agency (from the EU or Euratom budget).

In exceptional circumstances, to safeguard the EU's financial interests, the *Agency* may offset before the payment date specified in the debit note;

- (b) by **taking legal action** (see Article 57) or by **adopting an enforceable decision** under Article 299 of the Treaty on the Functioning of the EU (TFEU) and Article 79(2) of the Financial Regulation No 966/2012.

If payment is not made by the date in the debit note, the amount to be recovered (see above) will be increased by **late-payment interest** at the rate set out in Article 21.11, from the day following the payment date in the debit note, up to and including the date the *Agency* or the Commission receives full payment of the amount.

Partial payments will be first credited against expenses, charges and late-payment interest and then against the principal.

Bank charges incurred in the recovery process will be borne by the beneficiary, unless Directive 2007/64/EC applies.

SECTION 3 SUSPENSION AND TERMINATION

ARTICLE 47 — SUSPENSION OF PAYMENT DEADLINE

47.1 Conditions

The *Agency* may — at any moment — suspend the payment deadline (see Article 21.2 to 21.4) if a request for payment (see Article 20) cannot be approved because:

- (a) it does not comply with the provisions of the Agreement (see Article 20);
- (b) the technical reports or financial reports have not been submitted or are not complete or additional information is needed, or
- (c) there is doubt about the eligibility of the costs declared in the financial statements and additional checks, reviews, audits or investigations are necessary.

47.2 Procedure

The *Agency* will formally notify the coordinator of the suspension and the reasons why.

The suspension will **take effect** the day notification is sent by the *Agency* (see Article 52).

If the conditions for suspending the payment deadline are no longer met, the suspension will be **lifted** — and the remaining period will resume.

If the suspension exceeds two months, the coordinator may request the *Agency* if the suspension will continue.

If the payment deadline has been suspended due to the non-compliance of the technical or financial reports (see Article 20) and the revised report or statement is not submitted or was submitted but is

also rejected, the *Agency* may also terminate the Agreement or the participation of the beneficiary (see Article 50.3.1(l)).

ARTICLE 48 — SUSPENSION OF PAYMENTS

48.1 Conditions

The *Agency* may — at any moment — suspend, in whole or in part, the pre-financing payment and interim payments for one or more beneficiaries or the payment of the balance for all beneficiaries, if a beneficiary:

- (a) has committed or is suspected of having committed substantial errors, irregularities, fraud or serious breach of obligations in the award procedure or under this Agreement or
- (b) has committed — in other EU or Euratom grants awarded to it under similar conditions — systemic or recurrent errors, irregularities, fraud or serious breach of obligations that have a material impact on this grant (**extension of findings from other grants to this grant**; see Article 22.5.2).

48.2 Procedure

Before suspending payments, the *Agency* will formally notify the coordinator:

- informing it of its intention to suspend payments and the reasons why and
- inviting it to submit observations within 30 days of receiving notification.

If the *Agency* does not receive observations or decides to pursue the procedure despite the observations it has received, it will formally notify **confirmation** of the suspension. Otherwise, it will formally notify that the suspension procedure is not continued.

The suspension will **take effect** the day the confirmation notification is sent by the *Agency*.

If the conditions for resuming payments are met, the suspension will be **lifted**. The *Agency* will formally notify the coordinator.

During the suspension, the periodic report(s) (see Article 20.3) must not contain any individual financial statements from the beneficiary concerned. When the *Agency* resumes payments, the coordinator may include them in the next periodic report.

The beneficiaries may suspend implementation of the action (see Article 49.1) or terminate the Agreement or the participation of the beneficiary concerned (see Article 50.1 and 50.2).

ARTICLE 49 — SUSPENSION OF THE ACTION IMPLEMENTATION

49.1 Suspension of the action implementation, by the beneficiaries

49.1.1 Conditions

The beneficiaries may suspend implementation of the action or any part of it, if exceptional circumstances — in particular *force majeure* (see Article 51) — make implementation impossible or excessively difficult.

49.1.2 Procedure

The coordinator must immediately formally notify to the *Agency* the suspension (see Article 52), stating:

- the reasons why and
- the expected date of resumption.

The suspension will **take effect** the day this notification is received by the *Agency*.

Once circumstances allow for implementation to resume, the coordinator must immediately formally notify the *Agency* and request an **amendment** of the Agreement to set the date on which the action will be resumed, extend the duration of the action and make other changes necessary to adapt the action to the new situation (see Article 55) — unless the Agreement or the participation of a beneficiary has been terminated (see Article 50).

The suspension will be **lifted** with effect from the resumption date set out in the amendment. This date may be before the date on which the amendment enters into force.

Costs incurred during suspension of the action implementation are not eligible (see Article 6).

49.2 Suspension of the action implementation, by the *Agency*

49.2.1 Conditions

The *Agency* may suspend implementation of the action or any part of it:

- (a) if a beneficiary has committed or is suspected of having committed substantial errors, irregularities, fraud or serious breach of obligations in the award procedure or under this Agreement;
- (b) if a beneficiary has committed — in other EU or Euratom grants awarded to it under similar conditions — systemic or recurrent errors, irregularities, fraud or serious breach of obligations that have a material impact on this grant (**extension of findings from other grants to this grant**; see Article 22.5.2), or
- (c) if the action is suspected of having lost its scientific or technological relevance.

49.2.2 Procedure

Before suspending implementation of the action, the *Agency* will formally notify the coordinator:

- informing it of its intention to suspend the implementation and the reasons why and
- inviting it to submit observations within 30 days of receiving notification.

If the *Agency* does not receive observations or decides to pursue the procedure despite the observations it has received, it will formally notify **confirmation** of the suspension. Otherwise, it will formally notify that the procedure is not continued.

The suspension will **take effect** five days after confirmation notification is received by the coordinator (or on a later date specified in the notification).

It will be **lifted** if the conditions for resuming implementation of the action are met.

The coordinator will be formally notified of the lifting and the Agreement will be **amended** to set the date on which the action will be resumed, extend the duration of the action and make other changes necessary to adapt the action to the new situation (see Article 55) — unless the Agreement has already been terminated (see Article 50).

The suspension will be lifted with effect from the resumption date set out in the amendment. This date may be before the date on which the amendment enters into force.

Costs incurred during suspension are not eligible (see Article 6).

The beneficiaries may not claim damages due to suspension by the *Agency* (see Article 46).

Suspension of the action implementation does not affect the *Agency's* right to terminate the Agreement or participation of a beneficiary (see Article 50), reduce the grant or recover amounts unduly paid (see Articles 43 and 44).

ARTICLE 50 — TERMINATION OF THE AGREEMENT OR OF THE PARTICIPATION OF ONE OR MORE BENEFICIARIES

50.1 Termination of the Agreement by the beneficiaries

50.1.1 Conditions and procedure

The beneficiaries may terminate the Agreement.

The coordinator must formally notify termination to the *Agency* (see Article 52), stating:

- the reasons why and
- the date the termination will take effect. This date must be after the notification.

If no reasons are given or if the *Agency* considers the reasons do not justify termination, the Agreement will be considered to have been '**terminated improperly**'.

The termination will **take effect** on the day specified in the notification.

50.1.2 Effects

The coordinator must — within 60 days from when termination takes effect — submit:

- (i) a periodic report (for the open reporting period until termination; see Article 20.3) and
- (ii) the final report (see Article 20.4).

If the *Agency* does not receive the reports within the deadline (see above), only costs which are included in an approved periodic report will be taken into account.

The *Agency* will **calculate** the final grant amount (see Article 5.3) and the balance (see Article 21.4) on the basis of the reports submitted. Only costs incurred until termination are eligible (see Article 6). Costs relating to contracts due for execution only after termination are not eligible.

Improper termination may lead to a reduction of the grant (see Article 43).

After termination, the beneficiaries' obligations (in particular Articles 20, 22, 23, Section 3 of Chapter 4, 36, 37, 38 and 40) continue to apply.

50.2 Termination of the participation of one or more beneficiaries, by the beneficiaries

50.2.1 Conditions and procedure

The participation of one or more beneficiaries may be terminated by the coordinator, on request of the beneficiary concerned or on behalf of the other beneficiaries.

The coordinator must formally notify termination to the *Agency* (see Article 52) and inform the beneficiary concerned.

If the coordinator's participation is terminated without its agreement, the formal notification must be done by another beneficiary (acting on behalf of the other beneficiaries).

The notification must include:

- the reasons why;
- the opinion of the beneficiary concerned (or proof that this opinion has been requested in writing);
- the date the termination takes effect. This date must be after the notification, and
- a request for amendment (see Article 55), with a proposal for reallocation of the tasks and the estimated budget of the beneficiary concerned (see Annexes 1 and 2) and, if necessary, the addition of one or more new beneficiaries (see Article 56). If termination takes effect after the period set out in Article 3, no request for amendment must be included unless the beneficiary concerned is the coordinator. In this case, the request for amendment must propose a new coordinator.

If this information is not given or if the *Agency* considers that the reasons do not justify termination, the participation will be considered to have been **terminated improperly**.

The termination will **take effect** on the day specified in the notification.

50.2.2 Effects

The coordinator must — within 30 days from when termination takes effect — submit:

- (i) a report on the distribution of payments to the beneficiary concerned and
- (ii) if termination takes effect during the period set out in Article 3, a '**termination report**' from the beneficiary concerned, for the open reporting period until termination, containing an overview of the progress of the work, an overview of the use of resources, the individual financial statement and, if applicable, the certificate on the financial statement (see Articles 20.3 and 20.4).

The information in the termination report must also be included in the periodic report for the next reporting period (see Article 20.3).

If the request for amendment is rejected by the *Agency*, (because it calls into question the decision awarding the grant or breaches the principle of equal treatment of applicants), the Agreement may be terminated according to Article 50.3.1(c).

If the request for amendment is accepted by the *Agency*, the Agreement is **amended** to introduce the necessary changes (see Article 55).

The *Agency* will **calculate** — on the basis of the periodic reports, the termination report and the report on the distribution of payments — if the (pre-financing and interim) payments received by the beneficiary concerned exceed the beneficiary's EU contribution (calculated by applying the reimbursement rate(s) to the eligible costs declared by the beneficiary and approved by the *Agency*). Only costs incurred by the beneficiary concerned until termination takes effect are eligible (see Article 6). Costs relating to contracts due for execution only after termination are not eligible.

- If the payments received **exceed the amounts due**:
 - if termination takes effect during the period set out in Article 3 and the request for amendment is accepted, the beneficiary concerned must repay to the coordinator the amount unduly received. The *Agency* will formally notify the amount unduly received and request the beneficiary concerned to repay it to the coordinator within 30 days of receiving notification. If it does not repay the coordinator, the *Agency* will draw upon the Guarantee Fund to pay the coordinator and then notify a **debit note** on behalf of the Guarantee Fund to the beneficiary concerned (see Article 44);
 - in all other cases (in particular if termination takes effect after the period set out in Article 3), the *Agency* will formally notify a **debit note** to the beneficiary concerned. If payment is not made by the date in the debit note, the Guarantee Fund will pay to the *Agency* the amount due and the *Agency* will notify a debit note on behalf of the Guarantee Fund to the beneficiary concerned (see Article 44);
 - if the beneficiary concerned is the former coordinator, it must repay the new coordinator according to the procedure above, unless:
 - termination is after an interim payment and
 - the former coordinator has not distributed amounts received as pre-financing or interim payments (see Article 21.7).

In this case, the *Agency* will formally notify a **debit note** to the former coordinator. If payment is not made by the date in the debit note, the Guarantee Fund will pay to the *Agency* the amount due. The *Agency* will then pay the new coordinator and notify a debit note on behalf of the Guarantee Fund to the former coordinator (see Article 44).

- If the payments received **do not exceed the amounts due**: amounts owed to the beneficiary concerned will be included in the next interim or final payment.

If the *Agency* does not receive the termination report within the deadline (see above), only costs included in an approved periodic report will be taken into account.

If the *Agency* does not receive the report on the distribution of payments within the deadline (see above), it will consider that:

- the coordinator did not distribute any payment to the beneficiary concerned and that
- the beneficiary concerned must not repay any amount to the coordinator.

Improper termination may lead to a reduction of the grant (see Article 43) or termination of the Agreement (see Article 50).

After termination, the concerned beneficiary's obligations (in particular Articles 20, 22, 23, Section 3 of Chapter 4, 36, 37, 38 and 40) continue to apply.

50.3 Termination of the Agreement or the participation of one or more beneficiaries, by the *Agency*

50.3.1 Conditions

The *Agency* may terminate the Agreement or the participation of one or more beneficiaries, if:

- (a) one or more beneficiaries do not accede to the Agreement (see Article 56);
- (b) a change to their legal, financial, technical, organisational or ownership situation is likely to substantially affect or delay the implementation of the action or calls into question the decision to award the grant;
- (c) following termination of participation for one or more beneficiaries (see above), the necessary changes to the Agreement would call into question the decision awarding the grant or breach the principle of equal treatment of applicants (see Article 55);
- (d) implementation of the action is prevented by force majeure (see Article 51) or suspended by the coordinator (see Article 49.1) and either:
 - (i) resumption is impossible, or
 - (ii) the necessary changes to the Agreement would call into question the decision awarding the grant or breach the principle of equal treatment of applicants;
- (e) a beneficiary is declared bankrupt, being wound up, having its affairs administered by the courts, has entered into an arrangement with creditors, has suspended business activities, or is subject to any other similar proceedings or procedures under national law;
- (f) a beneficiary (or a natural person who has the power to represent or take decisions on its behalf) has been found guilty of professional misconduct, proven by any means;
- (g) a beneficiary does not comply with the applicable national law on taxes and social security;
- (h) the action has lost scientific or technological relevance;
- (i) *not applicable*;
- (j) *not applicable*;

- (k) a beneficiary (or a natural person who has the power to represent or take decisions on its behalf) has committed fraud, corruption, or is involved in a criminal organisation, money laundering or any other illegal activity affecting the EU's financial interests;
- (l) a beneficiary (or a natural person who has the power to represent or take decisions on its behalf) has — in the award procedure or under the Agreement — committed:
 - (i) substantial errors, irregularities, fraud or
 - (ii) serious breach of obligations, including improper implementation of the action, submission of false information, failure to provide required information, breach of ethical principles;
- (m) a beneficiary has committed — in other EU or Euratom grants awarded to it under similar conditions — systemic or recurrent errors, irregularities, fraud or serious breach of obligations that have a material impact on this grant ('extension of findings from other grants to this grant').

50.3.2 Procedure

Before terminating the Agreement or participation of one or more beneficiaries, the *Agency* will formally notify the coordinator:

- informing it of its intention to terminate and the reasons why and
- inviting it, within 30 days of receiving notification, to submit observations and — in case of Point (l.ii) above — to inform the *Agency* of the measures to ensure compliance with the obligations under the Agreement.

If the *Agency* does not receive observations or decides to pursue the procedure despite the observations it has received, it will formally notify to the coordinator **confirmation** of the termination and the date it will take effect. Otherwise, it will formally notify that the procedure is not continued.

The termination will take effect:

- for terminations under Points (b), (c), (e), (g), (h), (j), and (l.ii) above: on the day specified in the notification of the confirmation (see above);
- for terminations under Points (a), (d), (f), (i), (k), (l.i) and (m) above: on the day after the notification of the confirmation is received by the coordinator.

50.3.3 Effects

(a) for **termination of the Agreement**:

The coordinator must — within 60 days from when termination takes effect — submit:

- (i) a periodic report (for the last open reporting period until termination; see Article 20.3) and
- (ii) a final report (see Article 20.4).

If the Agreement is terminated for breach of the obligation to submit the reports (see Articles 20.8 and 50.3.1(l)), the coordinator may not submit any reports after termination.

If the *Agency* does not receive the reports within the deadline (see above), only costs which are included in an approved periodic report will be taken into account.

The *Agency* will **calculate** the final grant amount (see Article 5.3) and the balance (see Article 21.4) on the basis of the reports submitted. Only costs incurred until termination takes effect are eligible (see Article 6). Costs relating to contracts due for execution only after termination are not eligible.

This does not affect the *Agency's* right to reduce the grant (see Article 43) or to impose administrative and financial penalties (Article 45).

The beneficiaries may not claim damages due to termination by the *Agency* (see Article 46).

After termination, the beneficiaries' obligations (in particular Articles 20, 22, 23, Section 3 of Chapter 4, 36, 37, 38 and 40) continue to apply.

(b) for termination of the participation of one or more beneficiaries:

The coordinator must — within 60 days from when termination takes effect — submit:

- (i) a report on the distribution of payments to the beneficiary concerned;
- (ii) a request for amendment (see Article 55), with a proposal for reallocation of the tasks and estimated budget of the beneficiary concerned (see Annexes 1 and 2) and, if necessary, the addition of one or more new beneficiaries (see Article 56). If termination is notified after the period set out in Article 3, no request for amendment must be submitted unless the beneficiary concerned is the coordinator. In this case the request for amendment must propose a new coordinator, and
- (iii) if termination takes effect during the period set out in Article 3, a **termination report** from the beneficiary concerned, for the open reporting period until termination, containing an overview of the progress of the work, an overview of the use of resources, the individual financial statement and, if applicable, the certificate on the financial statement (see Article 20).

The information in the termination report must also be included in the periodic report for the next reporting period (see Article 20.3).

If the request for amendment is rejected by the *Agency* (because it calls into question the decision awarding the grant or breaches the principle of equal treatment of applicants), the Agreement may be terminated according to Article 50.3.1(c).

If the request for amendment is accepted by the *Agency*, the Agreement is **amended** to introduce the necessary changes (see Article 55).

The *Agency* will **calculate** — on the basis of the periodic reports, the termination report and the report on the distribution of payments — if the (pre-financing and interim) payments received by the beneficiary concerned exceed the beneficiary's EU contribution (calculated by applying the reimbursement rate(s) to the eligible costs declared by the beneficiary and approved by the *Agency*). Only costs incurred by the beneficiary concerned until termination takes effect are eligible (see Article 6). Costs relating to contracts due for execution only after termination are not eligible.

- If the payments received **exceed the amounts due**:
 - if termination takes effect during the period set out in Article 3 and the request for amendment is accepted, the beneficiary concerned must repay to the coordinator the amount unduly received. The *Agency* will formally notify the amount unduly received and request the beneficiary concerned to repay it to the coordinator within 30 days of receiving notification. If it does not repay the coordinator, the *Agency* will draw upon the Guarantee Fund to pay the coordinator and then notify a debit note on behalf of the Guarantee Fund to the beneficiary concerned (see Article 44);
 - in all other cases, in particular if termination takes effect after the period set out in Article 3, the *Agency* will formally notify a **debit note** to the beneficiary concerned. If payment is not made by the date in the debit note, the Guarantee Fund will pay to the *Agency* the amount due and the *Agency* will notify a debit note on behalf of the Guarantee Fund to the beneficiary concerned (see Article 44);
 - if the beneficiary concerned is the former coordinator, it must repay the new coordinator the amount unduly received, unless:
 - termination takes effect after an interim payment and
 - the former coordinator has not distributed amounts received as pre-financing or interim payments (see Article 21.7)

In this case, the *Agency* will formally notify a **debit note** to the former coordinator. If payment is not made by the date in the debit note, the Guarantee Fund will pay to the *Agency* the amount due. The *Agency* will then pay the new coordinator and notify a debit note on behalf of the Guarantee Fund to the former coordinator (see Article 44).

- If the payments received **do not exceed the amounts due**: amounts owed to the beneficiary concerned will be included in the next interim or final payment.

If the *Agency* does not receive the termination report within the deadline (see above), only costs included in an approved periodic report will be taken into account.

If the *Agency* does not receive the report on the distribution of payments within the deadline (see above), it will consider that:

- the coordinator did not distribute any payment to the beneficiary concerned, and that

- the beneficiary concerned must not repay any amount to the coordinator.

After termination, the concerned beneficiary's obligations (in particular Articles 20, 22, 23, Section 3 of Chapter 4, 36, 37, 38 and 40) continue to apply.

SECTION 4 FORCE MAJEURE

ARTICLE 51 — FORCE MAJEURE

'Force majeure' means any situation or event that:

- prevents either party from fulfilling their obligations under the Agreement,
- was unforeseeable, exceptional situation and beyond the parties' control,
- was not due to error or negligence on their part (or on the part of third parties involved in the action), and
- proves to be inevitable in spite of exercising all due diligence.

The following cannot be invoked as force majeure:

- any default of a service, defect in equipment or material or delays in making them available, unless they stem directly from a relevant case of force majeure,
- labour disputes or strikes, or
- financial difficulties.

Any situation constituting force majeure must be formally notified to the other party without delay, stating the nature, likely duration and foreseeable effects.

The parties must immediately take all the necessary steps to limit any damage due to force majeure and do their best to resume implementation of the action as soon as possible.

The party prevented by force majeure from fulfilling its obligations under the Agreement cannot be considered in breach of them.

CHAPTER 7 FINAL PROVISIONS

ARTICLE 52 — COMMUNICATION BETWEEN THE PARTIES

52.1 Form and means of communication

Communication under the Agreement (information, requests, submissions, 'formal notifications', etc.) must:

- be made in writing and
- bear the number of the Agreement.

Until the payment of the balance: all communication must be made through the electronic exchange system and using the forms and templates provided there.

After the payment of the balance: formal notifications must be made by registered post with proof of delivery ('formal notification on paper').

Communications in the electronic exchange system must be made by persons authorised according to the 'Terms and Conditions of Use of the electronic exchange system'. For naming the authorised persons, each beneficiary must have designated — before the signature of this Agreement — a 'Legal Entity Appointed Representative (LEAR)'. The role and tasks of the LEAR are stipulated in his/her appointment letter (see Terms and Conditions of Use of the electronic exchange system).

If the electronic exchange system is temporarily unavailable, instructions will be given on the *Agency* and Commission websites.

52.2 Date of communication

Communications are considered to have been made when they are sent by the sending party (i.e. on the date and time they are sent through the electronic exchange system).

Formal notifications through the **electronic** exchange system are considered to have been made when they are received by the receiving party (i.e. on the date and time of acceptance by the receiving party, as indicated by the time stamp). A formal notification that has not been accepted within 10 days after sending is considered to have been accepted.

Formal notifications **on paper** sent by **registered post** with proof of delivery (only after the payment of the balance) are considered to have been made on either:

- the delivery date registered by the postal service or
- the deadline for collection at the post office.

If the electronic exchange system is temporarily unavailable, the sending party cannot be considered in breach of its obligation to send a communication within a specified deadline.

52.3 Addresses for communication

The **electronic** exchange system must be accessed via the following URL:

<https://ec.europa.eu/research/participants/portal/desktop/en/projects/>

The *Agency* will formally notify the coordinator and beneficiaries in advance any changes to this URL.

Formal notifications on paper (only after the payment of the balance) addressed to the *Agency* must be sent to the following address:

*Executive Agency for Small and Medium-sized Enterprises (EASME)
H2020 Environment & Resources
B-1049 Brussels Belgium*

Formal notifications on paper (only after the payment of the balance) addressed to the **beneficiaries** must be sent to their legal address as specified in the 'Beneficiary Register'.

ARTICLE 53 — INTERPRETATION OF THE AGREEMENT

53.1 Precedence of the Terms and Conditions over the Annexes

The provisions in the Terms and Conditions of the Agreement take precedence over its Annexes.

Annex 2 takes precedence over Annex 1.

53.2 Privileges and immunities

Not applicable

ARTICLE 54 — CALCULATION OF PERIODS, DATES AND DEADLINES

In accordance with Regulation No 1182/71²⁸, periods expressed in days, months or years are calculated from the moment the triggering event occurs.

The day during which that event occurs is not considered as falling within the period.

ARTICLE 55 — AMENDMENTS TO THE AGREEMENT

55.1 Conditions

The Agreement may be amended, unless the amendment entails changes to the Agreement which would call into question the decision awarding the grant or breach the principle of equal treatment of applicants.

Amendments may be requested by any of the parties.

55.2 Procedure

The party requesting an amendment must submit a request for amendment signed in the electronic exchange system (see Article 52).

The coordinator submits and receives requests for amendment on behalf of the beneficiaries (see Annex 3).

If a change of coordinator is requested without its agreement, the submission must be done by another beneficiary (acting on behalf of the other beneficiaries).

The request for amendment must include:

- the reasons why;
- the appropriate supporting documents;
- for a change of coordinator without its agreement: the opinion of the coordinator (or proof that this opinion has been requested in writing).

²⁸ Regulation (EEC, Euratom) No 1182/71 of the Council of 3 June 1971 determining the rules applicable to periods, dates and time-limits (OJ L 124, 8.6.1971, p. 1).

The *Agency* may request additional information.

If the party receiving the request agrees, it must sign the amendment in the electronic exchange system within 45 days of receiving notification (or any additional information the *Agency* has requested). If it does not agree, it must formally notify its disagreement within the same deadline. The deadline may be extended, if necessary for the assessment of the request. If no notification is received within the deadline, the request is considered to have been rejected

An amendment **enters into force** on the day of the signature of the receiving party.

An amendment **takes effect** on the date agreed by the parties or, in the absence of such an agreement, on the date on which the amendment enters into force.

ARTICLE 56 — ACCESSION TO THE AGREEMENT

56.1 Accession of the beneficiaries mentioned in the Preamble

The other beneficiaries must accede to the Agreement by signing the Accession Form (see Annex 3) in the electronic exchange system (see Article 52) within 30 days after its entry into force (see Article 58).

They will assume the rights and obligations under the Agreement with effect from the date of its entry into force (see Article 58).

If a beneficiary does not accede to the Agreement within the above deadline, the coordinator must — within 30 days — request an amendment to make any changes necessary to ensure proper implementation of the action. This does not affect the *Agency's* right to terminate the Agreement (see Article 50).

56.2 Addition of new beneficiaries

In justified cases, the beneficiaries may request the addition of a new beneficiary.

For this purpose, the coordinator must submit a request for amendment in accordance with Article 55. It must include an Accession Form (see Annex 3) signed by the new beneficiary in the electronic exchange system (see Article 52).

New beneficiaries must assume the rights and obligations under the Agreement with effect from the date of their accession specified in the Accession Form (see Annex 3).

ARTICLE 57 — APPLICABLE LAW AND SETTLEMENT OF DISPUTES

57.1 Applicable law

The Agreement is governed by the applicable EU law, supplemented if necessary by the law of Belgium.

57.2 Dispute settlement

If a dispute concerning the interpretation, application or validity of the Agreement cannot be settled amicably, the General Court — or, on appeal, the Court of Justice of the European Union — has sole

jurisdiction. Such actions must be brought under Article 272 of the Treaty on the Functioning of the EU (TFEU).

If a dispute concerns administrative or financial penalties, offsetting or an enforceable decision under Article 299 TFEU (see Articles 44, 45 and 46), the beneficiaries must bring action before the General Court — or, on appeal, the Court of Justice of the European Union — under Article 263 TFEU. *Actions against enforceable decisions must be brought against the Commission (not against the Agency).*

ARTICLE 58 — ENTRY INTO FORCE OF THE AGREEMENT

The Agreement will enter into force on the day of signature by the *Agency* or the coordinator, depending on which is later.

SIGNATURES

For the coordinator

For the *Agency*



EUROPEAN COMMISSION
Executive Agency for Small and Medium-sized Enterprises
(EASME)

H2020 Environment & Resources



ANNEX 1 (part A)

Research and Innovation action

NUMBER — 688920 — REPAiR

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1.1. The project summary

Project Number ¹	688920	Project Acronym ²	REPAiR
One form per project			
General information			
Project title ³	REPAiR - REsource Management in Peri-urban AREas: Going Beyond Urban Metabolism		
Starting date ⁴	01/09/2016		
Duration in months ⁵	48		
Call (part) identifier ⁶	H2020-WASTE-2015-two-stage		
Topic	WASTE-6b-2015 Eco-innovative strategies		
Fixed EC Keywords	Ecodesign, Life Cycle Analysis, Geo-information and spatial data analysis, Resources efficiency		
Free keywords	Circular Economy, Peri-urban Areas, Decision Support Systems		
Abstract ⁷			
A shift towards a more circular economy is crucial to achieve more sustainable and inclusive growth. Our objective is to provide local and regional authorities with an innovative transdisciplinary open source geodesign decision support environment (GDSE) developed and implemented in living labs in six metropolitan areas. The GDSE allows creating integrated, place-based eco-innovative spatial development strategies aiming at a quantitative reduction of waste flows in the strategic interface of peri-urban areas. These strategies will promote the use of waste as a resource, thus support the on-going initiatives of the EC towards establishing a strong circular economy. The identification of such eco-innovative strategies will be based on the integration of life cycle thinking and geodesign to operationalise urban metabolism. Our approach differs from previous UM as we introduce a reversed material flow accounting to collect data accurate and detailed enough for the design of a variety of solutions to place-based challenges. The developed impact and decision models allow quantification and validation of alternative solution paths and therefore promote sustainable urban development built on near-field synergies between the built and natural environments. This will be achieved by quantifying and tracking essential resource flows, mapping and quantification of negative and positive effects of present and future resource flows, and the determination of a set of indicators to inform decision makers concerning the optimization of (re-)use of resources. The GDSE will be open source. With a budget of €5 million, REPAiR funds a consortium rich in experience in waste and resource management, spatial decision support, territorial governance, spatial planning and urban design, and has deep knowledge of the 6 case study areas. REPAiR is supported by a user board, of key stakeholders for the development of CE as well as local authorities, who are heavily involved in the GDSE testing.			

1.2. List of Beneficiaries

Project Number ¹	688920	Project Acronym ²	REPAiR		
List of Beneficiaries					
No	Name	Short name	Country	Project entry month ⁵	Project exit month
1	TECHNISCHE UNIVERSITEIT DELFT	TUD	Netherlands	1	48
2	UNIVERSITEIT GENT	UGENT	Belgium	1	48
3	UNIVERSITA DEGLI STUDI DI NAPOLI FEDERICO II.	UNINA	Italy	1	48
4	HAFENCITY UNIVERSITAT HAMBURG	HCU	Germany	1	48
5	MAGYAR TUDOMANYOS AKADEMIA KOZGAZDASAG-ES REGIONALIS TUDOMANYI KUTATOKOZPONT	RKI	Hungary	1	48
6	INSTYTUT GEOGRAFII I PRZESTRZENNEGO ZAGOSPODAROWANIA IM STANISLAWA LESZCZYCKIEGO POLSKIEJ AKADEMII NAUK	IGiPZ	Poland	1	48
7	JRC -JOINT RESEARCH CENTRE-EUROPEAN COMMISSION	JRC	Belgium	1	48
8	ARCINIEGAS LOPEZ GUSTAVO	Geo-Col	Netherlands	1	48
9	DELTA PROJECTONTWIKKELING BV	Delta	Netherlands	1	48
10	BIOKOM Pecs Varosuzemeltetesi es Kornyezetgazdalkodasi Nonprofit Korlatolt Felelossegu Tarsasag	BIOKOM	Hungary	1	48
11	Gertz Gutsche Rümenapp - Stadtentwicklung und Mobilität GbR	GGR	Germany	1	48
12	OPENBARE VLAAMSE AFVALSTOFFENMAATSCHAPPIJ	OVAM	Belgium	1	48
13	GEMEENTE HAARLEMMERMEER	GHM	Netherlands	1	48
14	REGIONE CAMPANIA	CAMPANIA	Italy	1	48
15	OLP SPOLKA Z OGRANICZONA ODPOWIEDZILNOSCIA	PHH	Poland	1	48
16	BAUER UMWELT GMBH	BAUER	Germany	1	48
17	INTERGEMEENTELIJKE VERENIGING VOORAFVALBEHEER IN GENT EN OMSTREKEN	IVAGO	Belgium	1	48
18	STADTREINIGUNG HAMBURG AOR	SRH	Germany	1	48

1.3. Workplan Tables - Detailed implementation

1.3.1. WT1 List of work packages

WP Number ⁹	WP Title	Lead beneficiary ¹⁰	Person-months ¹¹	Start month ¹²	End month ¹³
WP1	Project Management	1 - TUD	24.50	1	48
WP2	Developing and Implementing a Geodesign Decision Support Environment	11 - GGR	83.00	1	47
WP3	Developing and implementing territorial metabolism based representation and process models	1 - TUD	104.50	4	42
WP4	Developing and Implementing Sustainability Impact and Evaluation Models	2 - UGENT	100.00	4	42
WP5	Developing eco-innovative solutions and change strategies	3 - UNINA	117.00	1	48
WP6	Developing and implementing decision models	4 - HCU	61.30	1	38
WP7	Knowledge transfer between cases	5 - RKI	58.10	1	47
WP8	Dissemination and Exploitation	6 - IGiPZ	61.60	1	48
WP9	Ethics requirements	1 - TUD	N/A	1	48
Total			610.00		

1.3.2. WT2 list of deliverables

Deliverable Number ¹⁴	Deliverable Title	WP number ⁹	Lead beneficiary	Type ¹⁵	Dissemination level ¹⁶	Due Date (in months) ¹⁷
D1.1	Project Handbook	WP1	1 - TUD	Report	Confidential, only for members of the consortium (including the Commission Services)	1
D2.1	Vision of the GDSE applications	WP2	11 - GGR	Report	Public	4
D2.2	Data delivery plan	WP2	11 - GGR	Report	Confidential, only for members of the consortium (including the Commission Services)	10
D2.3	Programmed GDSE Modules	WP2	11 - GGR	Demonstration	Public	12
D2.4	Geodesign Workshops Handbook	WP2	1 - TUD	Report	Public	26
D2.5	Adapted GDSE modules	WP2	11 - GGR	Demonstration	Public	37
D2.6	GDSE andbook and technical documentation	WP2	11 - GGR	Report	Public	46
D3.1	Handbook Integrated Analyses	WP3	1 - TUD	Report	Public	12
D3.2	Report sociocultural/ socio-economic and company-related investigations for pilot studies.	WP3	5 - RKI	Report	Public	14
D3.3	Process model for pilot cases	WP3	1 - TUD	Other	Public	16
D3.4	Process model Ghent	WP3	2 - UGENT	Other	Public	20
D3.5	Process model Łódź	WP3	6 - IGIPZ	Other	Public	22
D3.6	Process model Hamburg	WP3	4 - HCU	Other	Public	24
D3.7	Process model Pécs	WP3	5 - RKI	Other	Public	26
D3.8	Report findings on socio-cultural/ socio-economic and company-related investigations	WP3	5 - RKI	Report	Public	32
D3.9	Comparison report for policy makers	WP3	5 - RKI	Report	Public	40

Deliverable Number ¹⁴	Deliverable Title	WP number ⁹	Lead beneficiary	Type ¹⁵	Dissemination level ¹⁶	Due Date (in months) ¹⁷
D4.1	ata availability Report Pilot cases	WP4	2 - UGENT	Report	Confidential, only for members of the consortium (including the Commission Services)	6
D4.2	Preliminary sustainability framework	WP4	2 - UGENT	Report	Confidential, only for members of the consortium (including the Commission Services)	12
D4.3	Complementarity analyses of local impacts	WP4	2 - UGENT	Report	Public	16
D4.4	Definitive Framework for sustainability assessment	WP4	2 - UGENT	Other	Public	24
D4.5	Aggregation of sustainability information	WP4	7 - JRC	Report	Confidential, only for members of the consortium (including the Commission Services)	24
D4.6	Sustainability assessment pilot cases	WP4	7 - JRC	Other	Public	26
D4.7	Sustainability assessment follow up cases	WP4	7 - JRC	Other	Public	42
D5.1	PULL Handbook	WP5	3 - UNINA	Report	Public	5
D5.2	Eco-innovative solution Amsterdam	WP5	1 - TUD	Other	Public	21
D5.3	Eco-innovative solutions Naples	WP5	3 - UNINA	Other	Public	21
D5.4	Handbook: How to run a PULL	WP5	3 - UNINA	Report	Public	21
D5.5	Eco-innovative solutions Ghent	WP5	2 - UGENT	Other	Public	32
D5.6	Eco-innovative solutions Łódź	WP5	6 - IGiPZ	Other	Public	35
D5.7	Eco-innovative sokutions Hamburg	WP5	4 - HCU	Other	Public	38
D5.8	Eco-innovative solutions Pécs	WP5	5 - RK1	Other	Public	41
D5.9	Final Updated Handbook: How	WP5	3 - UNINA	Report	Public	48

Deliverable Number ¹⁴	Deliverable Title	WP number ⁹	Lead beneficiary	Type ¹⁵	Dissemination level ¹⁶	Due Date (in months) ¹⁷
	to run a PULLs for dissemination purposes					
D6.1	Governance and decision processes in pilot cases	WP6	4 - HCU	Report	Public	6
D6.2	Governance and decision processes in follow up cases	WP6	4 - HCU	Report	Public	12
D6.3	Decision models pilot studies	WP6	4 - HCU	Report	Public	14
D6.4	Decision models follow up studies	WP6	4 - HCU	Report	Public	18
D6.5	Cross analyses decision models	WP6	4 - HCU	Report	Public	23
D6.6	Decisonmodels for GDSE	WP6	1 - TUD	Other	Confidential, only for members of the consortium (including the Commission Services)	30
D7.1	Theoretical model of knowledge transfer	WP7	1 - TUD	Report	Public	24
D7.2	Handbook knowledge transfer	WP7	5 - RKI	Other	Public	39
D8.1	Corporate identity	WP8	3 - UNINA	Other	Public	2
D8.2	Communication Handbook	WP8	6 - IGiPZ	Report	Public	3
D8.3	Basic Dissemination plan	WP8	6 - IGiPZ	Report	Confidential, only for members of the consortium (including the Commission Services)	3
D8.4	Data management plan	WP8	1 - TUD	Report	Confidential, only for members of the consortium (including the Commission Services)	6
D8.5	Project website	WP8	6 - IGiPZ	Other	Public	6
D8.6	Dissemination Plan and Dissemination Kit	WP8	6 - IGiPZ	Report	Public	12
D8.7	Scientific publications	WP8	6 - IGiPZ	Other	Public	48

Deliverable Number ¹⁴	Deliverable Title	WP number ⁹	Lead beneficiary	Type ¹⁵	Dissemination level ¹⁶	Due Date (in months) ¹⁷
D8.8	Workshops, press conferences, policy oriented seminars	WP8	6 - IGiPZ	Other	Public	48
D8.9	Exploitation plan	WP8	6 - IGiPZ	Report	Public	36
D8.10	Dissemination Kit	WP8	6 - IGiPZ	Report	Public	48
D8.11	Final data management plan	WP8	1 - TUD	ORDP: Open Research Data Pilot	Public	48
D8.12	Dissemination and exploitation report	WP8	6 - IGiPZ	Report	Public	48
D9.1	POPD - Requirement No. 7	WP9	1 - TUD	Ethics	Confidential, only for members of the consortium (including the Commission Services)	2
D9.2	H - Requirement No. 6	WP9	1 - TUD	Ethics	Confidential, only for members of the consortium (including the Commission Services)	2
D9.3	H - Requirement No. 5	WP9	1 - TUD	Ethics	Confidential, only for members of the consortium (including the Commission Services)	2
D9.4	H - Requirement No. 4	WP9	1 - TUD	Ethics	Confidential, only for members of the consortium (including the Commission Services)	2
D9.5	POPD - Requirement No. 3	WP9	1 - TUD	Ethics	Confidential, only for members of the consortium (including the Commission Services)	2
D9.6	H - Requirement No. 2	WP9	1 - TUD	Ethics	Confidential, only for members of the consortium (including the Commission Services)	2

Deliverable Number ¹⁴	Deliverable Title	WP number ⁹	Lead beneficiary	Type ¹⁵	Dissemination level ¹⁶	Due Date (in months) ¹⁷
D9.7	POPD - Requirement No. 1	WP9	1 - TUD	Ethics	Confidential, only for members of the consortium (including the Commission Services)	2

1.3.3. WT3 Work package descriptions

Work package number ⁹	WP1	Lead beneficiary ¹⁰	1 - TUD
Work package title	Project Management		
Start month	1	End month	48

Objectives

To conduct an efficient management process which ensures that the work is carried out in accordance with the Description of Action (DoA);
 To ensure the required quality and time schedules are achieved throughout the entire project duration;
 To facilitate the fulfilment of the partners' obligations to the EU from the legal, contractual, financial and administrative perspectives;
 And to effectively communicate between the consortium and the EU.

Description of work and role of partners

WP1 - Project Management [Months: 1-48]
TUD, UGENT, UNINA, HCU, RKI, IGiPZ
Task 1.1 Technical coordination (months # 1 to #48)
Task leader: TUD (A) (5PM);
Partners: ALL.
 The technical coordinator, in cooperation with the project manager and work package leaders, will perform technical monitoring. The technical coordinator will ensure:

- consistent coordination of the different research teams across the project activities;
- monitoring of realisation of the implementation plan;
- assessment and evaluation of the overall performance of the project;
- continuous quality assurance and timely submission of deliverables and reports;
- liaison with relevant key stakeholders;
- accurate risk analysis and contingency planning.

Technical management meetings will be held at regular intervals to assess the degree of work completion, including technical results and deliverable preparation. This continuous quality oversight is performed by the technical coordinator and will be reported in the periodic progress reports.

Task 1.2 Project Management (months # 1 to #48)
Task leader: TUD (VC) (16PM);
Partners: ALL.
 A dedicated project manager is responsible for the administrative, legal, financial, communications and organisational aspects of the project.
 The following tasks are performed:

- planning and organising project/Steering Committee (SC) meetings/teleconferences and safeguarding the follow-up actions and decision taken by the SC;
- compiling of SC minutes;
- drawing up a handbook on administrative issues;
- writing management reports including financial accounting;
- distributing of EU funds according to Grant Agreement;
- monitoring the budget and expenditures of the consortium and compiling financial reports;
- coordinating the submission of the deliverables, periodic and final reports (according the GA);
- maintaining all project related contracts such as Grant Agreement (GA), Description of Work (DoW) and Consortium Agreement (CA);
- supervising the contracts and applying for amendments in cooperation with technical coordinator, if necessary;
- acting as liaison with the European Commission (EU).

Task 1.3 Management of the PULLs (months # 5 to #42)
Task leader: UNINA (1PM), Partners: TUD, UG, HCU, RKI and IGiPZ (all 0.5 PM)

The management of the six PULLs requires administrative, legal, financial, communication and organisational tasks that are more easily and efficiently organised by the local PULLs responsible institution instead of the central project management. These tasks will be conducted by the PULLs coordinator.

Participation per Partner

Partner number and short name	WP1 effort
1 - TUD	21.50
2 - UGENT	0.50
3 - UNINA	1.00
4 - HCU	0.50
5 - RKI	0.50
6 - IGiPZ	0.50
Total	24.50

List of deliverables

Deliverable Number ¹⁴	Deliverable Title	Lead beneficiary	Type ¹⁵	Dissemination level ¹⁶	Due Date (in months) ¹⁷
D1.1	Project Handbook	1 - TUD	Report	Confidential, only for members of the consortium (including the Commission Services)	1

Description of deliverables

D 1.1 Project Handbook: Management Guidelines (month #1)

D1.1 : Project Handbook [1]

Handbook on administrative Issues

Schedule of relevant Milestones

Milestone number ¹⁸	Milestone title	Lead beneficiary	Due Date (in months)	Means of verification

Work package number ⁹	WP2	Lead beneficiary ¹⁰	11 - GGR
Work package title	Developing and Implementing a Geodesign Decision Support Environment		
Start month	1	End month	47

Objectives

The aim of this WP is to develop, test and implement a geodesign decision-support environment (GDSE) that supports the development of spatially integrated (waste) resource management strategies for peri-urban areas. REPAiR's Overall Approach 1.3.4. WP 2 integrates the models developed in WP 3 to WP 6 into the GDSE.

To develop the GDSE, the following sub-objectives have to be met:

- Develop, test and implement a software solution predominantly consisting of open source components that integrate the different models developed in WP 3 - 6.
- Develop, test and implement a collaborative framework that integrates the six steps and three iterations of a geodesign framework (see 1.1.3 for details).
- Organising a series of workshops (integrated into the PULLs) to integrate the knowledge and methodologies developed in WP 3-5 as well as the priorities of the stakeholder at the place in question (WP 6).

Description of work and role of partners

WP2 - Developing and Implementing a Geodesign Decision Support Environment [Months: 1-47]

GGR, TUD, UGENT, UNINA, HCU, RKI, IGIPZ, JRC, Geo-Col, Delta, BIOKOM, OVAM, GHM, CAMPANIA, PHH, BAUER, IVAGO, SRH

Task 2.1 Developing the five modules of the GDSE (month # 1 to #26)

Task leader is GGR (19 PM); Partners: TUD (8 PM); GEO-Col (5 PM) HCU (2 PM);

The GDSE consists of five modules, which, after the project, will be openly accessible and can be further used/developed by other stakeholders, such as local and regional authorities, consultancy firms and waste treatment companies. The modules are: data management (DBM), dialogue management (DM), model management (MM), the knowledge management (KM), and stakeholder management (SM). See 1.3.4 for more details.

Partner Responsibilities for all tasks:

- GGR is key responsible partner for overall coordination, DBM and MM.
- TUD is key responsible partner for KM and SM.
- Geo-Col is key responsible partner for DM.
- User board member for testing and feasibility check
- Students for testing

Task 2.2 Testing and Implementing the GDSE in the PULLs (months # 10 to #41)

Task leader is TUD (8 PM); Partners: GGR (8 PM); GEO-Col (4PM); HCU (2 PM); RKI (4 PM); UNINA (3 PM) IGIPZ (3 PM); UG ENT (2 PM); all others 1PM

Developing the GDSE is a stepwise process that will be tested in different settings. Workshops will be conducted with students, members of the project team and user board, as well as with selected stakeholders. As final event of every case study, one geodesign session will be held with the aim of developing one agreed resource management strategy. Task 2.2 contains the organisation, process definitions, production of storyboards, as well as the documentation of the workshops. Furthermore, task 2.2 includes the evaluation of these workshops in order to improve the GDSD step by step.

Task 2.3 Documentation of GDSE (months # 41 to 46)

Task leader is GGR (2PM); Partners: TUD (1 PM); GEO-Col (1 PM); HCU (1 PM)

To ensure the further uptake of the GDSE, all modules will be documented. This documentation will be made available open access via the 3TU OpenEarth Data Lab.

Participation per Partner

Partner number and short name	WP2 effort
1 - TUD	17.00

Partner number and short name	WP2 effort
2 - UGENT	2.00
3 - UNINA	3.00
4 - HCU	5.00
5 - RKI	4.00
6 - IGiPZ	3.00
7 - JRC	1.00
8 - Geo-Col	10.00
9 - Delta	1.00
10 - BOKOM	1.00
11 - GGR	29.00
12 - OVAM	1.00
13 - GHM	1.00
14 - CAMPANIA	1.00
15 - PHH	1.00
16 - BAUER	1.00
17 - IVAGO	1.00
18 - SRH	1.00
Total	83.00

List of deliverables

Deliverable Number ¹⁴	Deliverable Title	Lead beneficiary	Type ¹⁵	Dissemination level ¹⁶	Due Date (in months) ¹⁷
D2.1	Vision of the GDSE applications	11 - GGR	Report	Public	4
D2.2	Data delivery plan	11 - GGR	Report	Confidential, only for members of the consortium (including the Commission Services)	10
D2.3	Programmed GDSE Modules	11 - GGR	Demonstrator	Public	12
D2.4	Geodesign Workshops Handbook	1 - TUD	Report	Public	26
D2.5	Adapted GDSE modules	11 - GGR	Demonstrator	Public	37
D2.6	GDSE andbook and technical documentation	11 - GGR	Report	Public	46

Description of deliverables

D 2.1 - Vision of the GDSE applications (in order to set clear expectations from the beginning). (month #4)
D 2.2 - Data requirement description and data delivery plan for the case study areas (month #7).
D 2.3 - Programmed test version, ready-to-use main structure of the GDSE. (month #12)
D 2.4a and b: Handbook for geodesign workshops, including process description, storyboards, documentation and evaluation manuals updated for pilot studies. (a month #16) and follow up cases (b month # 26)
D 2.5a to d 2.5d adapted modules (DBM, MM, KM, DM), reconfigured and ready-to-use for the four following geodesign projects. (month # 28, 31, 34, 37)
D 2.6: User handbook and technical documentation: How to use the GDSE. (month # 46)

D2.1 : Vision of the GDSE applications [4]

Vision of the GDSE applications (in order to set clear expectations from the beginning)

D2.2 : Data delivery plan [10]

Data requirement description and data delivery plan for the case study areas

D2.3 : Programmed GDSE Modules [12]

Programmed modules for the two pilot applications in Naples and Amsterdam ready to used.

D2.4 : Geodesign Workshops Handbook [26]

Handbook to guide the geodesign workshops. First version for the pilot cases ready in month 16, revised second version in month 26.

D2.5 : Adapted GDSE modules [37]

Adapted GDSE modules (DBM, MM, KM, DM), reconfigured and ready-to-use for the four follow up geodesign projects. (month # 28, #31, #34, #37)

D2.6 : GDSE andbook and technical documentation [46]

User handbook and technical documentation: How to use the GDSE for dissemination purposes.

Schedule of relevant Milestones

Milestone number ¹⁸	Milestone title	Lead beneficiary	Due Date (in months)	Means of verification
MS1	Catalogue of minimum requirements for the GDSE	11 - GGR	4	A Catalogue of minimum requirements for the GDSE agreed on by the project board
MS2	Detailed technical concept for each GIS-based components	11 - GGR	10	Detailed technical concept for each GIS-based component, taking into account the specific requirements as well as existing data and models of each of the six geodesign projects. Delivered in form of a report.
MS3	Programmed modules for the two pilot applications in Naples and Amsterdam	11 - GGR	14	A ready-to-use beta version of Programmed modules for the two pilot applications in Naples and Amsterdam.
MS4	Geodesign workshop Amsterdam	1 - TUD	25	Geodesign workshops with stakeholders in the case of Amsterdam. As

Schedule of relevant Milestones

Milestone number ¹⁸	Milestone title	Lead beneficiary	Due Date (in months)	Means of verification
				final event of every case study, one geodesign session will be held with the aim of developing one agreed resource management strategy.
MS5	Geodesign workshop Naples	3 - UNINA	26	Geodesign workshops with stakeholders in the case of Naples. As final event of every case study, one geodesign session will be held with the aim of developing one agreed resource management strategy.
MS6	Geodesign workshop Ghent	2 - UGENT	32	Geodesign workshops with stakeholders in the case of Ghent. As final event of every case study, one geodesign session will be held with the aim of developing one agreed resource management strategy.
MS7	Geodesign workshop Łódź	6 - IGiPZ	35	Geodesign workshops with stakeholders in the case of Łódź. As final event of every case study, one geodesign session will be held with the aim of developing one agreed resource management strategy.
MS8	Geodesign workshop Hamburg.	4 - HCU	38	Geodesign workshop with stakeholders in Hamburg. As final event of every case study, one geodesign session will be held with the aim of developing one agreed resource management strategy.
MS9	Geodesign workshop Pécs	5 - RKI	41	Geodesign workshops with stakeholders in Pécs. As final event of every case study, one geodesign session will be held with the aim of developing one agreed resource management strategy.

Work package number ⁹	WP3	Lead beneficiary ¹⁰	I - TUD
Work package title	Developing and implementing territorial metabolism based representation and process models		
Start month	4	End month	42

Objectives

WP3's aim is to analyse and describe the case study areas with their subsystems and processes that define the area's metabolic patterns, from the vantage point of waste production and waste management. The domains place, flow & stocks, and behaviour & governance are taken into account with regard to spatial (where?), contextual (what, why, who and how?) and temporal (when?) dimensions. The representation and process models developed in WP3 directly communicate with evaluation, impact and change models at the heart of WP4 and WP5 and are used as input to the GDSE WP 2.

Description of work and role of partners

WP3 - Developing and implementing territorial metabolism based representation and process models [Months: 4-42]

TUD, UGENT, UNINA, HCU, RKI, IGiPZ, JRC, Geo-Col, Delta, BIODOM, GGR, OVAM, GHM, CAMPANIA, PHH, BAUER, IVAGO, SRH

Task 3.1: Spatial analysis (Months # 2-26)

Task leader: UNINA (5PM); Partners leading one case study: TUD (4PM), UGENT (3 PM), HCU (3 PM), RKI (5PM), IGiPZ (5 PM); Other input: JRC (1 PM), GEO-Col (1 PM), GGR (0.5PM), GMH (0.5 PM), CRA (0.5 PM), PHH (0.5 PM), Bauer (1 PM), IVAGO (0.5 PM);

T3.1 defines goals, methodology and means of representation regarding a spatial description of the case study areas, to better understand the relation between the morphology and physiological activities in space. T. 3.1 describes the system's physical and administrative borders, infrastructures, land-use, typologies, planning specifications, with (GIS-) maps, texts, photography and other means of representation. Primary questions are:

- What are the (system) boundaries of the area?
- What is the area's general, physical and human geography?
- What is the waste-specific geography of the area?
- What are the relevant prior plans, projects and policies?
- What data sources are relevant and accessible?

Task 3.2: Material flow analyses (Months # 2-26)

Task leader: TUD (8 PM); Flow modelling: JRC (8 PM), Partners leading one case study: UGENT (6 PM), UNINA (3 PM), HCU (3 PM), RKI (3PM), IGiPZ (3 PM); Other input: GEO-Col (1 PM), GMH (0.5 PM), Biokom (0.5 PM), OVAM (0.5 PM), IVAGO (0.5 PM), SRH (0.5 PM), DELTA (0.5 PM)

Task 3.2 studies the material flows & stocks of the area's subsystems, based on consumption patterns and waste production. T. 3.2 aims to identify the specific activities relating material flows & stocks from waste production in subsystems: referred to as reversed material flow accounting (r-MFA). Questions are for example:

- What are the area's major physical and human geographical processes in relation to waste management?
- What are the qualitative and quantitative waste flow specifications in content, space and time?
- How and where are the associated processes interlinked?
- What is the data quality available with regard to these processes?

Task 3.3 – Surveys of households and companies (Months # 2–40)

Task leader: RKI (14 PM); Partners leading one case study: TUD (3 PM), UGENT (3 PM), UNINA (3 PM), HCU (3 PM), IGiPZ (5 PM); Other input: JRC (1 PM), DELTA (0.5 PM), Biokom (0.5PM), GGR (0.5 PM), OVAM (0.5 PM), GMH (0.5 PM), CRA (0.5 PM), PHH (0.5 PM), IVAGO (0.5 PM), SRH (0.5 PM);

T.3.3 focuses on different socio-cultural and socio-economic factors that influence metabolic patterns in the case study areas. The surveys have two target groups: households and companies. For households, the research aims to analyse individuals' social values, norms, beliefs, and attitudes, as well as features of their socio-economic status. T.3.3 aims to survey companies' 'waste-intelligence' and 'waste-sensitivity' (companies' waste management regulations and practices, awareness of waste issues), and compare these later results to the outcomes of the survey on socio-cultural/ socio-economic factors. Questions are:

- How to conceptualise a theoretical frame for operationalization?

- What are the relevant socio-cultural/socio-economic indicators and features of companies' 'waste-intelligence' and 'waste-sensitivity'?
- What are the area's socio-cultural/socio-economic characteristics, and what are the findings on companies' awareness towards waste issues?
- What can the research reveal about the basic assumption?

Participation per Partner

Partner number and short name	WP3 effort
1 - TUD	15.00
2 - UGENT	12.00
3 - UNINA	11.00
4 - HCU	9.00
5 - RKI	22.00
6 - IGIPZ	13.00
7 - JRC	10.00
8 - Geo-Col	2.00
9 - Delta	1.00
10 - BLOKOM	1.00
11 - GGR	1.00
12 - OVAM	1.00
13 - GHM	1.00
14 - CAMPANIA	1.00
15 - PHH	1.00
16 - BAUER	1.00
17 - IVAGO	1.50
18 - SRH	1.00
Total	104.50

List of deliverables

Deliverable Number ¹⁴	Deliverable Title	Lead beneficiary	Type ¹⁵	Dissemination level ¹⁶	Due Date (in months) ¹⁷
D3.1	Handbook Integrated Analyses	1 - TUD	Report	Public	12
D3.2	Report sociocultural/socio-economic and company-related investigations for pilot studies.	5 - RKI	Report	Public	14

List of deliverables

Deliverable Number ¹⁴	Deliverable Title	Lead beneficiary	Type ¹⁵	Dissemination level ¹⁶	Due Date (in months) ¹⁷
D3.3	Process model for pilot cases	1 - TUD	Other	Public	16
D3.4	Process model Ghent	2 - UGENT	Other	Public	20
D3.5	Process model Łódź	6 - IGiPZ	Other	Public	22
D3.6	Process model Hamburg	4 - HCU	Other	Public	24
D3.7	Process model Pécs	5 - RKI	Other	Public	26
D3.8	Report findings on socio-cultural/socio-economic and company-related investigations	5 - RKI	Report	Public	32
D3.9	Comparison report for policy makers	5 - RKI	Report	Public	40

Description of deliverables

D 3.1 Internal guidelines (Handbook): Introduction to methodology for integrated spatial, material flow and social analyses. (month #12)

D 3.2 Report on socio-cultural/socio-economic and company-related investigations for the two pilot studies. (Month #14)

D 3.3 Definitive process model for the two pilot cases, including digital maps, database and reports of – the interplay between – spatial, material flow and social analyses. (month #16)

D 3.4 Definitive process model for the four follow-up studies, including digital maps, database and reports of – the interplay between – spatial, material flow and social analyses. (months #20 – #26)

D 3.5 Report on the main findings on socio-cultural/socio-economic and company-related investigations in all case studies. (month #32)

D 3.6 Comparison report of resource models with lessons for policy makers. (month # 40)

D3.1 : Handbook Integrated Analyses [12]
Handbook: Introduction to methodology for integrated spatial, material flow and social analyses. Definition of methods applied for the development of the six models.

D3.2 : Report sociocultural/socio-economic and company-related investigations for pilot studies. [14]
Report of results on sociocultural/socio-economic and company-related investigations for the two pilot studies.

D3.3 : Process model for pilot cases [16]
Definitive process model for the two pilot cases, including digital maps, database and reports of – the interplay between – spatial, material flow and social analyses.

D3.4 : Process model Ghent [20]
Definitive process model for the case of Ghent, including digital maps, database and reports of – the interplay between – spatial, material flow and social analyses.

D3.5 : Process model Łódź [22]
Definitive process model for the case of Łódź , including digital maps, database and reports of – the interplay between – spatial, material flow and social analyses.

D3.6 : Process model Hamburg [24]

Definitive process model for the case of Hamburg, including digital maps, database and reports of – the interplay between – spatial, material flow and social analyses.

D3.7 : Process model Pécs [26]

Definitive process model for the case of Pécs , including digital maps, database and reports of – the interplay between – spatial, material flow and social analyses.

D3.8 : Report findings on socio-cultural/socio-economic and company-related investigations [32]

Report on the main findings on socio-cultural/socio-economic and company-related investigations in all case studies.

D3.9 : Comparison report for policy makers [40]

Comparison report of resource strategies with lessons for policy makers.

Schedule of relevant Milestones

Milestone number ¹⁸	Milestone title	Lead beneficiary	Due Date (in months)	Means of verification
MS10	Definition of system boundaries and goals and data assessment	1 - TUD	10	Definition of system boundaries and goals and data assessment of core material flows and subcategories, spatial qualities, social aspects from the two pilot studies agreed on by the project board.
MS11	Questionnaire for Household and Companies Surveys	5 - RKI	10	Elaborated questionnaire for T-3.3 surveys ready to use and agreed on by the project board.
MS12	Preliminary representation and process models	1 - TUD	13	Preliminary representation and process models ready to be integrated into GDSE. First maps and data bases delivered in order to test within the GDSE
MS13	Validation of Pilot Study Models	1 - TUD	19	Validation of the methodology and calibration of models from the 2 pilot studies agreed on by the project board in order to prepare models for the follow up studies.

Work package number ⁹	WP4	Lead beneficiary ¹⁰	2 - UGENT
Work package title	Developing and Implementing Sustainability Impact and Evaluation Models		
Start month	4	End month	42

Objectives

The main objective of WP4 is to analyse the sustainability of the present urban metabolism (WP3) in the case study areas and the influences of eco-innovative solutions (WP5) in a spatially differentiated and trans-disciplinary way. This WP has several sub-objectives:

- Develop a framework of quantitative sustainability indicators starting from the existing framework developed by PROSUITE.
- Analyse the need for assessment of local impacts in the peri-urban areas
- Analysis of available data sources and cross check with the framework development and decision needs in the case study areas.
- Integration of indicators at different levels to deliver comprehensive sustainability support for the GDSE
- Applying the framework to the case studies

Description of work and role of partners

WP4 - Developing and Implementing Sustainability Impact and Evaluation Models [Months: 4-42]

UGENT, TUD, UNINA, HCU, RKI, IGiPZ, JRC, Geo-Col, Delta, BIOKOM, GGR, OVAM, PHH, BAUER, IVAGO, SRH

Task 4.1 Development of sustainability assessment framework (Months # 4-12)

Task leader: UGHENT (10 PM); Partners: TUD (3 PM), UNINA (1 PM), RKI (4 PM), IGiPZ (4 PM), JRC (8 PM), DELTA (0.5 PM), Biokom (0.5PM), GGR (1 PM), OVAM (1 PM), PHH (0.5 PM), Bauer (0.5 MP), IVAGO (0.5 PM), SRH (0.5 PM);

The starting points of the framework are the endpoints developed in PROSUITE. First, this framework will be updated with state-of-the-art methodologies, such as the Product and Organisation Environmental Footprint (PEF/OEF), indicators for waste management and recycling benefits. The main challenge lies in tailoring the framework to evaluate peri-urban areas in a multidisciplinary (economic, ecologic, social) and spatially differentiated way. The PROSUITE framework was developed to assess the sustainability impact of new technologies worldwide rather than assessing a specific region. Therefore, following questions need to be resolved:

- Which impacts occur at a peri-urban level that are typically missed when performing traditional sustainability assessments?
- Which indicators are available and which can be of added value for integration into the sustainability framework.
- How can these local impacts be linked to existing/new impact categories?
- Which data are available at which level?

The functionality of indicators is important, but data availability can be a main bottleneck. Therefore a strong link with WP3 is required to assess the availability of data on regional and local scales. Where necessary and possible, additional data will be collected or generated starting from available sources such as: urban bookkeeping, reports, local studies, local IO tables, surveys, network analysis, sector statistics, and field work.

The results of task 4.1 are a new list of indicators and aggregation options.

Task 4.2 Aggregation of sustainability indicators in the assessment framework (Months #8-24 pilot and #16 - 32 follow up)

Task leader: JRC (10 PM); Partners: TUD (3 PM), UGHENT (8 PM), RKI (2 PM), IGiPZ (2 PM), DELTA (0.5 PM), GGR (0.5 PM) GEO-COL (0.5 PM);

T.4.2 focuses on the integration of all this information into a relevant and limited set of indicators both at peri-urban area and economy-wide levels using multi-criteria assessment techniques. A balance will be made between the complexity of information and the need for clear input to decision-making. Many sustainability assessment practices such as LCA focus on gathering economy-wide sustainability information. Given the nature of the REPAiR project, the interest is to gain insights into effects at a local urban/peri-urban area level. Therefore, the aim is to merge sustainability information from the local and economy-wide levels.

Task 4.3 Generating evaluation models (Months #10-15 pilot and #16-21 follow up)

Task leader: UGHENT (4 PM); Partners: TUD (3 PM), UNINA (1 PM), RKI (2 PM), IGiPZ (2 PM), JRC (3 PM), GEO-Col (0.5 PM), DELTA (0.5 PM), GGR (0.5 PM), OVAM (1 PM), PHH (0.5 PM), SRH (0.5 PM);

In T.4.3 the previously developed framework will be applied to the existing situation first in the two pilot studies and thereafter in the follow-up cases. Results will be developed based on an analysis (GIS layers, tables and diagrams) of the existing situation in relation to the key flows (WP3) of the urban metabolism and the key challenges identified by the key stakeholders (WP6). The results will be, in an abstracted form, integrated into the GDSE (WP2).

Task 4.4 Generating impact models (Month #12-24 (pilot) and #26-42 (follow up))

Task leader: UGHENT (4 PM); Partners: TUD (3 PM), UNINA (1 PM), RKI (2 PM), IGiPZ (2 PM), JRC (3 PM), GEO-Col (0.5 PM), Biokom (0.5 PM), GGR (0.5 PM), OVAM (1 PM), Bauer (0.5 MP);

In this task the framework will be applied to specific proposed changes to key challenges as well as to change strategies built on a combination of individual changes, both produced in WP 5. The resulting assessment will be, in an abstracted form, the input for decision finding in the stakeholder workshops organised in WP2.

Participation per Partner

Partner number and short name	WP4 effort
1 - TUD	12.00
2 - UGENT	26.00
3 - UNINA	3.00
4 - HCU	2.00
5 - RKI	10.00
6 - IGiPZ	10.00
7 - JRC	24.00
8 - Geo-Col	2.00
9 - Delta	1.00
10 - BIOKOM	1.00
11 - GGR	2.50
12 - OVAM	3.00
15 - PHH	1.00
16 - BAUER	1.00
17 - IVAGO	0.50
18 - SRH	1.00
Total	100.00

List of deliverables

Deliverable Number ¹⁴	Deliverable Title	Lead beneficiary	Type ¹⁵	Dissemination level ¹⁶	Due Date (in months) ¹⁷
D4.1	ata availability Report Pilot cases	2 - UGENT	Report	Confidential, only for members of the consortium (including the Commission Services)	6

List of deliverables

Deliverable Number ¹⁴	Deliverable Title	Lead beneficiary	Type ¹⁵	Dissemination level ¹⁶	Due Date (in months) ¹⁷
D4.2	Preliminary sustainability framework	2 - UGENT	Report	Confidential, only for members of the consortium (including the Commission Services)	12
D4.3	Complementarity analyses of local impacts	2 - UGENT	Report	Public	16
D4.4	Definitive Framework for sustainability assessment	2 - UGENT	Other	Public	24
D4.5	Aggregation of sustainability information	7 - JRC	Report	Confidential, only for members of the consortium (including the Commission Services)	24
D4.6	Sustainability assessment pilot cases	7 - JRC	Other	Public	26
D4.7	Sustainability assessment follow up cases	7 - JRC	Other	Public	42

Description of deliverables

D 4.1: Analysis of data availability for region-level pilot cases (month #6))
D 4.2: Preliminary sustainability framework ready for testing the GDSE (month #12)
D4.3: Analysis of local impacts and complementarity with the existing sustainability assessment framework (month #16)
D 4.4: Framework for sustainability assessment available (month #24)
D 4.5: Aggregation strategy for the sustainability information (month #26)
D 4.6: Sustainability assessment of eco-innovative solutions in the pilot case studies (month #26)
D 4.7: Sustainability assessment of eco-innovative solutions in all case studies (month #42)

D4.1 : ata availability Report Pilot cases [6]
Analysis of data availability at regional level pilot cases

D4.2 : Preliminary sustainability framework [12]
Preliminary sustainability framework ready for testing the evaluation and impact model for GDSE

D4.3 : Complementarity analyses of local impacts [16]
Analysis of local impacts and complementarity with the existing sustainability assessment framework

D4.4 : Definitive Framework for sustainability assessment [24]
Framework for sustainability assessment available.

D4.5 : Aggregation of sustainability information [24]
Aggregation strategy for the sustainability information. In order integrate assessment through scales and across different indicators.

D4.6 : Sustainability assessment pilot cases [26]

Sustainability assessment of eco-innovative solutions in the pilot case studies.

D4.7 : Sustainability assessment follow up cases [42]

Sustainability assessment of eco-innovative solutions in all follow up case studies

Schedule of relevant Milestones

Milestone number ¹⁸	Milestone title	Lead beneficiary	Due Date (in months)	Means of verification
MS14	Benchmark of available data versus existing indicator	2 - UGENT	8	Benchmark of available data versus existing indicator framework ready and agreed on by the project board.
MS15	Possibilities of sustainability assessment at regional level	7 - JRC	12	Possibilities analysed of sustainability assessment at regional level and agreed on by the project board.
MS16	Test of framework for assessment	2 - UGENT	12	Test of assessment framework in the pilot cases ready and applied during workshop with stakeholders.
MS17	Handbook Sustainability Assessment	2 - UGENT	26	Handbook for sustainability assessment in the repair project ready and available on the project webpage

Work package number ⁹	WP5	Lead beneficiary ¹⁰	3 - UNINA
Work package title	Developing eco-innovative solutions and change strategies		
Start month	1	End month	48

Objectives

The key objective of WP 5 is to generate a diversity of possible solutions for key challenges with a view to the development of a more circular economy in the case areas through the following sub-objectives:

- Developing and setting up 'peri-urban living labs' (PULLs) in two pilot case studies: Amsterdam and Naples.
- Performing PULLs in two pilot case studies in order to produce a variety of designs for eco-innovative solutions for a more circular economy.
- Adapting the setup of PULLs for the four additional cases and performing the PULLs to produce a variety of designs for eco-innovative solutions for a more circular economy.
- Preparing a catalogue of solutions to be included in the GDSE and to be used for further dissemination.

Description of work and role of partners

WP5 - Developing eco-innovative solutions and change strategies [Months: 1-48]

UNINA, TUD, UGENT, HCU, RKI, IGIPZ, JRC, Geo-Col, Delta, BIOKOM, GGR, OVAM, GHM, CAMPANIA, PHH, BAUER, IVAGO, SRH

WP 5 is organised in five tasks separating the organisation, the carrying out and the documentation of the PULLs.

Task 5.1 Developing and organising six peri-urban living labs (Months #1-6 (pilot) and #20-23 (follow up))

Task leader: UNINA (2 PM); Partners: TUD (2 PM), RKI (2 PM), others (0.5 PM);

The development and organisation of PULLs have subtasks related to the location and organisation as well as to integrating education into the PULLs.

Organisation

- Prepare concrete time and work plan, which includes the involvement and tasks of single participants as well as the concrete setup of the PULLs;
- Definition of key challenges for a circular economy;
- Defining the specific outcomes of the PULLs;

Location

- Defining the physical locations as well as hard and software needed for the PULLs;
- Establishing links to key stakeholders and arranging their involvement.

Education

- Establish those forms of education most feasible for local partners as well as time and date assigned to the PULLs.
- Ensure the integration of teaching activities into the regular teaching programs and their formal requirements.
- Definition of general and specific assignments as well as related learning objectives.
- Preparation of course descriptions, including learning goals, expected outcome, course materials as well as assessment criteria for all planned courses.

PULLs Lead responsible partners for all tasks: Naples: UNINA; Amsterdam: TUD; Ghent: UGHENT; Hamburg: HCU; Łódź: IGIPZ; Pécs: RKK;

Task 5.2 Carrying out of PULLs in two pilot studies (Months #7-24)

Task leader: UNINA (15 PM) and TUD (9 PM); Partners: UGHENT (0.5 PM), HCU (0.5 PM), RKI (2 PM), IGIPZ (2 PM), JRC (2 PM), GEO-Col (1 PM), DELTA (2 PM), GGR (0.5 PM), GMH (2.5 PM), CRA (4 PM), Bauer (1 PM); Biokom (1 PM)

Task 5.2 carries out the PULLs in the pilot studies and integrates activities from several WPs in order to develop eco-innovative solutions for specific challenges as well as strategies for CE. This is done during a series of design studios and interlinked design workshops with students and stakeholders. (see 1.3.3.4 for details)

Task 5.3 Preparation of methodological guidelines for the PULLs (Months # 17-20)

Task leader: UNINA (7 PM); Partners: TUD (2 PM), UGHENT (1 PM), HCU (0.5 PM), RKI (1 PM), IGIPZ (1 PM), GEO-Col (0.5 PM); CRA (0.5 PM); Biokom (1 PM)

Preparation of a PULLs handbook, explaining the approach and the theoretical framework developed in the pilot PULLs. This handbook serves as the starting point for the organisation of the PULLs in the follow-up cases.

Task 5.4 Carrying out the PULLs in four follow-up cases (Months #23-42)

Task leader: UNINA (4 PM); Partners: TUD (2 PM), UGENT (3 PM), HCU (4 PM), RKI (3PM), IGiPZ (3 PM), JRC (2 PM), GEO-Col (0.5 PM), Biokom (2 PM), GGR (0.5 PM), OVAM (2 PM), CRA (0.5 PM), PHH (4 PM), Bauer (1.5 MP), IVAGO (2 PM), SRH (2.5 PM);

Task 5.4 carries out the PULLs in the follow-up studies and integrates activities from several WPs in order to develop eco-innovative solutions for specific challenges as well as strategies for CE. This is done during a series of design weeks and interlinked design workshops with students and stakeholders. (see 1.3.3.4 for details)

Task 5.5 Documentation of eco-innovative solutions (Months #15-18 and #30-48)

Task leader: UNINA (5 PM); Partners: TUD (2 PM), others (0.5 PM);

Task. 5.5 produces catalogues of eco-innovative solutions and change strategies for internal knowledge transfer (WP 7), dissemination (WP 8) and use in the GDSE (WP 2) from the results of T 5.3 and 5.4.

Participation per Partner

Partner number and short name	WP5 effort
1 - TUD	17.00
2 - UGENT	5.50
3 - UNINA	33.00
4 - HCU	2.00
5 - RKI	9.00
6 - IGiPZ	9.00
7 - JRC	5.00
8 - Geo-Col	2.50
9 - Delta	3.00
10 - BLOKOM	3.00
11 - GGR	1.00
12 - OVAM	3.00
13 - GHM	3.50
14 - CAMPANIA	6.00
15 - PHH	5.00
16 - BAUER	3.00
17 - IVAGO	3.00
18 - SRH	3.50
Total	117.00

List of deliverables

Deliverable Number ¹⁴	Deliverable Title	Lead beneficiary	Type ¹⁵	Dissemination level ¹⁶	Due Date (in months) ¹⁷
D5.1	PULL Handbook	3 - UNINA	Report	Public	5
D5.2	Eco-innovative solution Amsterdam	1 - TUD	Other	Public	21

List of deliverables

Deliverable Number ¹⁴	Deliverable Title	Lead beneficiary	Type ¹⁵	Dissemination level ¹⁶	Due Date (in months) ¹⁷
D5.3	Eco-innovative solutions Naples	3 - UNINA	Other	Public	21
D5.4	Handbook: How to run a PULL	3 - UNINA	Report	Public	21
D5.5	Eco-innovative solutions Ghent	2 - UGENT	Other	Public	32
D5.6	Eco-innovative solutions Łódź	6 - IGiPZ	Other	Public	35
D5.7	Eco-innovative sokutions Hamburg	4 - HCU	Other	Public	38
D5.8	Eco-innovative solutions Pécs	5 - RKI	Other	Public	41
D5.9	Final Updated Handbook: How to run a PULLs for dissemination purposes	3 - UNINA	Report	Public	48

Description of deliverables

Deliverables

D 5.1: Methodological guidelines (Handbook) for the PULLs (month #5);
D 5.2a and b: Catalogue of solutions and strategies for Amsterdam and Naples (month #21)
D 5.3: Handbook: How to run a PULLs. (month #20)
D 5.4a to d: Catalogue of solutions and strategies for follow up cases. (month #32, #35, #38, #41)
D 5.5: Updated Handbook: How to run a PULLs for dissemination purposes. (month #48)

D5.1 : PULL Handbook [5]

Methodological guidelines to conduct the PULLs.

D5.2 : Eco-innovative solution Amsterdam [21]

Catalogue of solutions and strategies developed in Amsterdam in form of drawings (GIS)-maps, data bases and reports.

D5.3 : Eco-innovative solutions Naples [21]

Catalogue of solutions and strategies developed in Naplesin form of drawings (GIS)-maps, data bases and reports.

D5.4 : Handbook: How to run a PULL [21]

Handbook 'How to run a PULL' for follow up studies as well as for dissemination purposes.

D5.5 : Eco-innovative solutions Ghent [32]

Catalogue of solutions and strategies developed in Ghentin form of drawings (GIS)-maps, data bases and reports.

D5.6 : Eco-innovative solutions Łódź [35]

Catalogue of solutions and strategies developed in Łódź in the form of drawings (GIS)-maps, data bases and reports.

D5.7 : Eco-innovative sokutions Hamburg [38]

Catalogue of solutions and strategies developed in Hamburg in form of drawings (GIS)-maps, data bases and reports.

D5.8 : Eco-innovative solutions Pécs [41]

Catalogue of solutions and strategies developed in Pécs in form of drawings (GIS)-maps, data bases and reports.

D5.9 : Final Updated Handbook: How to run a PULLs for dissemination purposes [48]

Updated Handbook: How to run a PULL for dissemination purposes.

Schedule of relevant Milestones

Milestone number ¹⁸	Milestone title	Lead beneficiary	Due Date (in months)	Means of verification
MS18	Preparation of Pilot Pulls	3 - UNINA	5	Definitive location, organizational settings and educational outline for two pilot PULLs. Amsterdam and Naples ready and agreed on by the project board. Facilitation of PULLs secured.
MS19	International Student Workshops	1 - TUD	21	International student workshops bringing together the multidisciplinary teams from both pilot cases (month #13 and #21) WS took place and outputs are documented on the project webpage.
MS20	First Set of solutions for pilot cases	3 - UNINA	15	First set of solutions for a selection of challenges in pilot cases is ready for testing the GDSE.
MS21	Organizational settings of PULLs for follow-up studie	3 - UNINA	15	Definitive location and organizational settings of PULLs for follow-up studies ready and agreed on by the project board and facilitation of PULLs is secured.
MS22	Student Presentation follow up Pulls	3 - UNINA	31	Final presentation and evaluation of student work of the follow-up PULLs. (months #22, 25, 28, 31). Presentations took place in front of members of the consortium and key stakeholders of the area. Results documented on the project webpage.

Work package number ⁹	WP6	Lead beneficiary ¹⁰	4 - HCU
Work package title	Developing and implementing decision models		
Start month	I	End month	38

Objectives

Objectives

The main objective is to develop and implement decision models. WP 6 has the following sub-objectives:

- Analyse the decision making landscape of the six case study areas (stakeholders, processes, legal framework)
- Develop decision models for all six geodesign studies based on the outputs of WP3-5 and in connection with the analysis of the decision making landscape.
- Implement these decision models in cooperation with stakeholders in the six case study areas
- Connect the outcomes of WP6 with those of WP2 and insert the decision models into the GDSE.

Description of work and role of partners

WP6 - Developing and implementing decision models [Months: 1-38]

HCU, TUD, UGENT, UNINA, RKI, IGiPZ, JRC, Geo-Col, Delta, BIODKOM, GGR, OVAM, GHM, CAMPANIA, PHH, BAUER, IVAGO, SRH

Task 6.1 Analysis of the decision making landscape in the case study areas (Months #1-12)

Task leader: HCU (5 PM); Partners: TUD (1 PM), OVAM (1 PM), IGiPZ (1 PM), RKI (6 PM), others (0.3 PM);

The aim of task 6.1 is to understand the decision making structure and processes with regard to the resource management and circular economy of the six case study areas:

- first step, information about actors and institutions is collected from existing sources and through interviews with local project partners and key persons. (Who are the public/private stakeholders? Key stakeholders will already be involved in user and advisory boards.)

- second step, a profound document analysis (legal frameworks, contracts, and newspaper articles) is undertaken. Analysing interrelation of decision possibilities of stakeholders and frame conditions (contracts, laws, legal standards, cultural norms, existing infrastructure);

Based on the two previous steps interviews with actors and institutions are conducted to answer the following questions:

- Which are the priorities of the key actors?
- Are peoples' positions known?
- What are the objectives and requirements of the decision makers?
- What do the decision makers need to know in order to implement change?
- What is the relative importance of objectives, and what are these objectives based on?

As a first product, a report comparing the governance structure and decision processes in all case study areas is being compiled.

Partner Responsibilities:

- HCU lead on development of analysis framework, conduction of analysis, interviews, elaboration of report;
- RKK co-responsible: analysis framework, conduction of interviews, analysis, elaboration of report: (6 Person Months);
- OVAM input on analysis framework, practicability check.
- Others: supporting the identification of and contact with their case specific stakeholders;

Task 6.2 Development of decision models for all case studies (Months #13-18)

Task leader: HCU (5 PM); Partners: RKI (6 PM), IGiPZ (1 PM), OVAM (2 PM), others (0.3 PM);

The aim of task 6.2 is to develop methods to relate the impacts of the change models with the priorities of the key actors through:

- Finding out which consequences of change models are considered most important by the key actors.
- Providing a methodology to allow decision makers to decide among different change possibilities.
- Connecting the outputs of WP3-5 with the outputs of a) analysis of decision making landscape.
- Developing a methodology to assess whether scale of scoping, change and assessment coincide with the scale needed for decision.

As product various decision models for the case study areas will be proposed.

Partner Responsibilities:

- HCU: lead on development of methods and methodologies, overview description of models.

- RKI: co-responsible for development of methods and methodologies, overview description of models;
- OVAM: input on methods and models, practicability check;
- Others: delivering input on different models for their case study areas.

Task 6.3 Implementation of decision (support) models (Months #16 -23)

Task leader: HCU (6 PM); Partners: RKI (6 PM), OVAM (1 PM), others (0.4 PM)

The aim of task 6.3 is to test the proposed decision models in their practical implementation in the case study areas together with the relevant stakeholders.

- While being implemented in the case study areas the decision support models will be tested, analysed and evaluated.
- Based on the results of the evaluation process, the decision support models will be refined and improved for practical implementation.
- A cross analysis of the testing phase of the decision support models in all case study areas will be conducted in order to identify case study independent success and obstacle factors. This cross analysis will safeguard the transferability and replicability of the developed and tested decision support models.

Partner Responsibilities:

- HCU: Lead on coordination of the implementation of the decision support models; analysis and evaluation; improvement of decision models; cross analysis;
- RKI co-responsible on coordination of the implementation of the decision support models; analysis and evaluation; improvement of decision models; cross analysis.
- OVAM: monitoring of the implementation models with emphasis on practicability topics
- Others: steering the implementation of the decision models in their case study areas, deliverance of experience with the implementation of decision models;

Task 6.4 Integration of the decision models and the geo-design decision support environment (Months #11-38)

Task leader: TUD (3 PM); Partners: HCU (2 PM), RKI (2 PM)

Task 6.4 integrates the transferable and replicable results on decision support models into the multi criteria decision support environment of the GDSE, to be able to use the results of WP 6 in the stakeholder workshops.

Partner Responsibilities:

- TUD leading the coordination of the integration;
- HCU and RKI supporting the integration;

Participation per Partner

Partner number and short name	WP6 effort
1 - TUD	4.70
2 - UGENT	1.00
3 - UNINA	1.00
4 - HCU	18.00
5 - RKI	20.00
6 - IGiPZ	2.40
7 - JRC	0.70
8 - Geo-Col	0.70
9 - Delta	2.00
10 - BIODKOM	0.70
11 - GGR	0.40
12 - OVAM	4.00
13 - GHM	1.00
14 - CAMPANIA	1.00
15 - PHH	1.00

Partner number and short name	WP6 effort
16 - BAUER	0.70
17 - IVAGO	1.00
18 - SRH	1.00
Total	61.30

List of deliverables

Deliverable Number ¹⁴	Deliverable Title	Lead beneficiary	Type ¹⁵	Dissemination level ¹⁶	Due Date (in months) ¹⁷
D6.1	Governance and decision processes in pilot cases	4 - HCU	Report	Public	6
D6.2	Governance and decision processes in follow up cases	4 - HCU	Report	Public	12
D6.3	Decision models pilot studies	4 - HCU	Report	Public	14
D6.4	Decision models follow up studies	4 - HCU	Report	Public	18
D6.5	Cross analyses decision models	4 - HCU	Report	Public	23
D6.6	Decision models for GDSE	1 - TUD	Other	Confidential, only for members of the consortium (including the Commission Services)	30

Description of deliverables

D 6.1 a and b Reports comparing the governance structure and decision processes in all case study areas (for pilot studies month #6; for follow-up cases month #12)

D 6.2 a and b Description decision models for all case study areas and overview study on all decision models. (for pilot studies month #14; for other cases month #18)

D 6.3 Report on cross analysis on the developed and tested decision support models. (for pilot studies month #19; for other cases month #23)

D 6.4a and f Input of decision models into the geo-design decision support environment. (for pilot studies month #22; for follow-up cases month #30)

D6.1 : Governance and decision processes in pilot cases [6]
Report comparing the governance structure and decision processes in pilot case study areas.

D6.2 : Governance and decision processes in follow up cases [12]
Report comparing the governance structure and decision processes in follow up case study areas.

D6.3 : Decision models pilot studies [14]
Description decision models for all pilot studies.

D6.4 : Decision models follow up studies [18]
Description of decision models for all case study areas and overview study on all decision models.

D6.5 : Cross analyses decision models [23]

Report on cross analysis on the developed and tested decision support models.

D6.6 : Decisionmodels for GDSE [30]

Input of decision models into the geo-design decision support environment. (pilot studies moth 22 follow up month 30)

Schedule of relevant Milestones

Milestone number ¹⁸	Milestone title	Lead beneficiary	Due Date (in months)	Means of verification
MS23	List of key priorities of stakeholders in pilot cases	4 - HCU	6	First list of key priorities of stakeholders in pilot studies available and ready to be integrated into GDSE testing.
MS24	Draft decision models for pilot studies	1 - TUD	10	Draft decision models for GDSE developing in pilot studies. Decision models integrated into GDSE for testing.
MS25	Key priorities of stakeholders in follow-up studies	4 - HCU	12	First list of key priorities of stakeholders in follow-up studies ready to be integrated into GDSE.
MS26	Draft decision models for follow-up studies	4 - HCU	24	Draft decision models in follow-up studies ready to be integrated into the GDSE.

Work package number ⁹	WP7	Lead beneficiary ¹⁰	5 - RKI
Work package title	Knowledge transfer between cases		
Start month	I	End month	47

Objectives

The goal of WP7 is to elaborate a methodology for knowledge transfer that reveals the most effective and appropriate knowledge transfer channels, tools and processes across peri-urban areas with differentiated knowledge, technological, socio-cultural and governance characteristics.

WP7 draws on the results from WP 3 - 6 to (1) promote knowledge transfer across case study areas; and to (2) provide the users of REPAiR's outputs with a generally applicable methodology facilitating successful knowledge transfer. The objects of the transfer across the case study areas will be eco-innovative solutions and strategies defined in the living labs.

Description of work and role of partners

WP7 - Knowledge transfer between cases [Months: 1-47]

RKI, TUD, UGENT, UNINA, HCU, IGiPZ, JRC, Geo-Col, Delta, BIOKOM, GGR, OVAM, GHM, CAMPANIA, PHH, BAUER, IVAGO, SRH

Task 7.1. Analysis of the theory of knowledge transfer (Months #1-9)

Task leader: TUD (2 PM); Partners: UNINA (1 PM), HCU (1 PM), RKI (2 PM);

This task will entail a critical review of the theoretical literature on knowledge transfer and the related concepts (policy transfer, lesson-drawing, policy diffusion) in order to provide an input for Task 7.2. and to establish a conceptual framework for the further tasks in WP 7.

Task 7.2 Analysis of the characteristics of the case study areas for the purpose of knowledge transfer (Months #9-26)

Task leader: RKI (8 PM); case study responsible Partners: TUD (2 PM), UGENT (1 PM), UNINA (2 PM), HCU (2 PM), IGiPZ (2 PM), all others (0.2 PM)

Drawing on inputs from WPs 3-6, Task 7.2 identifies the characteristics of each of the case study areas that influence the transferability of knowledge across them. This will entail investigating four categories of characteristics: (1) governance scope: characteristics of the national and sub-national institutional systems in which the stakeholders operate (input from WP 6); (2) socio-cultural scope: social and cultural characteristics that affect the behaviour of actors (input from WPs 2-5); (3) technological and eco-innovative scope: characteristics determining the capacity to generate new technologies and eco-innovations (input from WP 5); (4) metabolic scope: territorial characteristics that shape metabolic flows (input from WPs 3, 4).

Data on the characteristics of case study areas will also be sourced from the students' assignments (teaching courses in WP 5) and from the literature and the available statistical data sources (e.g. Eurostat, ESPON, OECD Regional Database, European Innovation Scoreboard, Eurobarometer). The analysed peculiarities of case study areas in WP 7 will be fed back iteratively to the living labs' activities as part of WP 5.

Task 7.3 Organising knowledge transfer events as part of the PULLs in case study areas (Months #12-17)

Lead partner: TUD (1 PM); Participants: RKI (1 PM), all other partners (feed in data from WP2-6 and participation in workshops in the PULLs (0.1 PM)

Task 7.4 will entail organizing six knowledge transfer events bringing together the relevant stakeholders as part of the living labs in two case study areas. The purpose of these events is to demonstrate transferable solutions as well as to gather feedback from them that will be used to refine the methodology of knowledge transfer (Task 7.4) and to elaborate the online handbook of knowledge transfer (Task 7.5).

Task 7.4 Building a methodology for knowledge transfer (Months #25-36)

Lead partner: RKI (6 PM)

Participants: TUD (3 PM), UNINA (2 PM), UGhent (2 PM), HCU (1 PM), IGiPZ (4 PM) (BIOKOM (3 PM).

Task 7.3 will build on inputs from Tasks 7.1 and 7.2 to establish a knowledge transfer methodology. This will allow for avoiding fruitless efforts to copy and apply strategies and solutions that are not transferable between the particular contexts; and ensure an informed, strategic and, hence, successful transfer of knowledge across the case study areas. Building of the methodology will entail identifying the main barriers to successful knowledge transfer across differentiated socio-spatial contexts and defining a typology of strategies and solutions that will help to filter and tailor them to the characteristics of the different urban settings. Reflecting a bottom-up approach, the methodology will draw on inputs provided by stakeholders in living labs.

Task 7.5 Creating an online handbook of transferable solutions and methods to facilitate transfer (Months #31-42)

Lead partner: RKI (3 PM); Participants: TUD (2 PM), check of translation: UNINA (0.1 PM), U Ghent (0.1 PM), HCU (0.1 PM), IGIPZ (0.1 PM), all others input and feedback on the handbook (0.1PM).

The open access online handbook will present the methodology for ensuring that the transfer of strategies and eco-innovative solutions defined in living labs to other contexts is purposeful, tailored to the local context and, thus, successful. The handbook will (1) introduce the theoretical model of knowledge transferability; (2) describe the key lessons on transfer of knowledge drawn from REPAIR; (3) discuss the potential barriers and characteristics of the knowledge transfer observed; and (4) offer guidelines for better transferability by taking the local peculiarities into consideration. To broaden its user base, the handbook will be written in a non-technical and accessible language, the partners from the industry and local / regional authorities will be involved in drafting of the handbook (Task 7.4), and it will also be published in the languages used in the case study areas.

Participation per Partner

Partner number and short name	WP7 effort
1 - TUD	10.00
2 - UGENT	3.20
3 - UNINA	5.20
4 - HCU	4.20
5 - RKI	20.00
6 - IGIPZ	7.10
7 - JRC	0.40
8 - Geo-Col	0.40
9 - Delta	1.00
10 - BLOKOM	3.40
11 - GGR	0.40
12 - OVAM	0.40
13 - GHM	0.40
14 - CAMPANIA	0.40
15 - PHH	0.40
16 - BAUER	0.40
17 - IVAGO	0.40
18 - SRH	0.40
Total	58.10

List of deliverables

Deliverable Number ¹⁴	Deliverable Title	Lead beneficiary	Type ¹⁵	Dissemination level ¹⁶	Due Date (in months) ¹⁷
D7.1	Theoretical model of knowledge transfer	1 - TUD	Report	Public	24
D7.2	Handbook knowledge transfer	5 - RKI	Other	Public	39

Description of deliverables

D 7.1: A report outlining the methodology knowledge transfer. (month #36)
D 7.2: An online handbook for knowledge transfer in English, Dutch, German, Hungarian, Italian and Polish. (month #39)
D7.1 : Theoretical model of knowledge transfer [24]
Theoretical model of knowledge transfer across peri-urban areas
D7.2 : Handbook knowledge transfer [39]
On-line handbook for knowledge transfer for dissemination purposes

Schedule of relevant Milestones

Milestone number ¹⁸	Milestone title	Lead beneficiary	Due Date (in months)	Means of verification
MS27	Knowledge Transfers Events	1 - TUD	31	Organizing and conducting knowledge transfers events as part of PULLs. (months #13 ,17, 22, 25, 28 and 31)
MS28	methodology for knowledge transfer	5 - RKI	22	Draft methodology for knowledge transfer ready and agreed on by the project board.

Work package number ⁹	WP8	Lead beneficiary ¹⁰	6 - IGiPZ
Work package title	Dissemination and Exploitation		
Start month	1	End month	48

Objectives

The overall aim of this work package is to maximize the impact of REPAiR's results. Its objectives are to:

- Deliver the dissemination and exploitation strategies (section 2.2) and extend the outreach of the project;
- Ensure the transfer of knowledge and expertise to the identified target groups;
- Ensure the intellectual property management (IP), including data management and the fulfilment of the general principles regarding the protection and exploitation of the foreground IP;
- Prepare the path for future uptake of the GDSE tool and ensure utilization of the project's results.

The importance of disseminating and exploiting the REPAiR results is recognised and several actions and mechanisms will be put in place to achieve this.. To achieve these objectives, the dissemination and exploitation activities of the project will be coordinated and monitored by the dissemination manager DEM (Magdalena Górczyńska, IGiPZ), and the exploitation manager, respectively. Though the implementation of the dissemination and exploitation strategy, as described in section 2.2, the outreach to the full range of target groups potentially interested in the project outcomes will be ensured.

Description of work and role of partners

WP8 - Dissemination and Exploitation [Months: 1-48]

IGiPZ, TUD, UGENT, UNINA, HCU, RKI, JRC, Geo-Col, Delta, BIODKOM, GGR, OVAM, GHM, CAMPANIA, PHH, BAUER, IVAGO, SRH

Task 8.1. Internal guidelines for dissemination (Months #1-3)

Task leader: IGiPZ (2 PM); Partners: TUD (0.5 PM), JRC (0.5 PM), RKI (0.5 PM)

Task 8.1 will define common principles of internal communication throughout the project lifetime. For each deliverable it shall specify the communication channels, targeted end users and responsible partner(s). The Internal communication plan (ICP) will be a living document accessible to all partners via the project's website and regularly updated in the periods corresponding to the project's milestones.

Task 8.2. Development of Corporate identity (Months #1-2)

Task leader: UNINA (2 PM); Partners: TUD (0.5 PM); IGiPZ (0.5 PM)

This task is related to elaboration of the corporate identity including: (1) definition of guidelines in terms of corporate design (logo, tag lines, colours, font, graphics); (2) creation of identity materials and layouts for communication deliverables which correspond to the identified types of end users; (3) outline of how these materials should be used in the promotion and presentation of the project.

Task 8.3. Development of the dissemination plan and dissemination kit (months #1-3 and #19 -20)

Task leader: IGiPZ (2 PM); Partners: TUD (1 PM), JRC (1 PM), RKI (1 PM), DELTA (0.5 PM), OVAM (0.5 PM)

The dissemination plan will match particular channels of dissemination (website, newsletter, workshops, scientific conferences, etc.) with the deliverables (reports, scientific articles, features in online and printed media, handbook, software) and with the identified groups of end-users (academics, practitioners, NGO's and students). This will ensure that the results of the project (at any stage) are shared with appropriate audiences and in a comprehensible manner. A basis dissemination kit will be delivered along with the detailed dissemination plan. A comprehensive dissemination kit will be delivered at the end of the project. It will provide a comprehensive package of PR material, explaining the essence of the REPAiR project and including, among other things, the descriptions of the project results, visual materials (infographics, pictures) and videos to communicate the REPAiR project in the broadest sense.

Task 8.4. REPAiR project website (Months #1-48)

Task leader: IGiPZ (creation, maintenance, deliverables; 3PM); Partners: UNINA (design, deliverables; 1PM), GGR (software support; 1PM), UG, HCU, RKI (resources and deliverables from each WP; 1 PM per partner), TUD (updated info about project itself; 2 PM)

This task will establish the project's website. The website will above all provide a principal channel for dissemination and exploitation. It will include project presentation, open access documents (project reports, GDSE manual, knowledge transfer handbook, papers, etc.), downloadable GDSE software package, links to related projects, news section, etc. It will also include an embedded social media component and regularly updated project news, coupled with a calendar

of the events organized as part of REPAiR. Finally, it will provide a platform for internal exchange and collaboration within the project consortium.

Task 8.5. Data management (Months #1-48)

Task leader: TUD (coordination, 3 PM); **Partners:** UNINA, RKI, HCU, IGIPZ, UG (PULLs leaders responsible for collecting and providing the data; 0.5 PM per Partner), GGR (0.5 PM)

For each data type generated by the project, a widely used, open and easy-to-share file format will be used to store the data in the OpenEarth DataLab (see 2.2.4). The research data gathered will be described in a data management plan that will be delivered early on in the project's timeline, following the guidelines set by the European Commission, and updated over the course of the project. Since the project data management plan is expected to mature during the course of the project, a more updated version of the plan will be developed in the middle of the project. A final version of the plan, which will include information about how these data will be exploited and/or shared/made accessible for verification and re-use, and how this data will be curated and preserved, will be developed at the end of the project. The purpose of the data management plan within REPAiR is to support the data management life cycle for all data that will be collected, processed or generated.

Task 8.6. Promotion and external dissemination of the project's results (Months #8-48)

Task leader: IGIPZ (5 PM); **Partners (all):** TUD (2 PM); UGENT (0.5 PM), UNINA (0.5 PM), RKI (2.5 PM), JRC (dissemination mainly at the EU level; 3 PM); all other partners each 1 PM, members of the user board

This task will entail raising awareness and dissemination of REPAiR's research approach and scientific and technical results to the key target audiences, which requires an accurate adaptation of the channels of dissemination and its forms. The target audiences for dissemination are specified in section 2.2.1.

Task 8.7. Strategy for exploitation of results (months #24-36)

Task leader: TUD (coordination 3 PM); all other partners provide feedback, each 0.1PM

An exploitation plan will be produced to ensure future uptake of the GDSE by public authorities and the use of the knowledge and deliverables generated as part of REPAiR. The plan will be tailored and oriented to the specific groups of end users, as defined in section 2.2.1.

Participation per Partner

Partner number and short name	WP8 effort
1 - TUD	12.00
2 - UGENT	3.00
3 - UNINA	4.10
4 - HCU	2.10
5 - RKI	4.60
6 - IGIPZ	13.10
7 - JRC	6.10
8 - Geo-Col	1.10
9 - Delta	1.60
10 - BLOKOM	3.10
11 - GGR	2.60
12 - OVAM	1.60
13 - GHM	1.10
14 - CAMPANIA	1.10
15 - PHH	1.10
16 - BAUER	1.10
17 - IVAGO	1.10
18 - SRH	1.10

Partner number and short name	WP8 effort
Total	61.60

List of deliverables

Deliverable Number ¹⁴	Deliverable Title	Lead beneficiary	Type ¹⁵	Dissemination level ¹⁶	Due Date (in months) ¹⁷
D8.1	Corporate identity	3 - UNINA	Other	Public	2
D8.2	Communication Handbook	6 - IGiPZ	Report	Public	3
D8.3	Basic Dissemination plan	6 - IGiPZ	Report	Confidential, only for members of the consortium (including the Commission Services)	3
D8.4	Data management plan	1 - TUD	Report	Confidential, only for members of the consortium (including the Commission Services)	6
D8.5	Project website	6 - IGiPZ	Other	Public	6
D8.6	Dissemination Plan and Dissemination Kit	6 - IGiPZ	Report	Public	12
D8.7	Scientific publications	6 - IGiPZ	Other	Public	48
D8.8	Workshops, press conferences, policy oriented seminars	6 - IGiPZ	Other	Public	48
D8.9	Exploitation plan	6 - IGiPZ	Report	Public	36
D8.10	Dissemination Kit	6 - IGiPZ	Report	Public	48
D8.11	Final data management plan	1 - TUD	ORDP: Open Research Data Pilot	Public	48
D8.12	Dissemination and exploitation report	6 - IGiPZ	Report	Public	48

Description of deliverables

- D 8.1. Corporate identity (month #2)
- D 8.2. Communication Handbook (month #3)
- D 8.3 Basic Dissemination plan (month #3)
- D 8.4. Draft Research Data management plan (month #6)
- D 8.5 Project website (month #6)
- D 8.6 Detailed Dissemination Plan and Dissemination Kit (month #12)
- D 8.7 Scientific publications (months #22-48)

D 8.8 Participation in and/or organization of workshops, press conferences, stakeholder events, policy-oriented seminars
D 8.9 Exploitation plan (month #36)
D 8.10 Comprehensive Dissemination Kit (project legacy) (month #48)
D 8.11 Final data management plan (month #48)
D 8.12 Final report on dissemination and exploitation of project results (month #48)
D8.1 : Corporate identity [2] First CI for use in all documents, maps, on-line activities. Will be updated during the project.
D8.2 : Communication Handbook [3] Handbook of communication and dissemination activities.
D8.3 : Basic Dissemination plan [3] Basic Dissemination plan with first strategy for all dissemination activities.
D8.4 : Data management plan [6] Draft research data management plan, adapted during the project.
D8.5 : Project website [6] Project website, with public and internal restricted area. Updated during the project.
D8.6 : Dissemination Plan and Dissemination Kit [12] Detailed Dissemination Plan and Dissemination Kit, that will guide dissemination activities through out the project and after the project duration.
D8.7 : Scientific publications [48] A number of scientific publications, by different project partners, to be defined in the dissemination plan.
D8.8 : Workshops, press conferences, policy oriented seminars [48] Participation in and/or organization of workshops, press conferences, policy oriented seminars which will be nearer defined in the dissemination plan.
D8.9 : Exploitation plan [36] Exploitation plan for the GDSE during the last phase of REPAiR as well as after the project.
D8.10 : Dissemination Kit [48] Comprehensive Dissemination Kit in order to provide a comprehensive package of PR material, explaining the essence of the REPAiR project and including, among other things, the descriptions of the project results, visual materials (infographics, pictures) and videos to communicate the REPAiR project in the broadest sense.
D8.11 : Final data management plan [48] the final data management plan will explain how project data will be exploited and/or shared/made accessible for verification and re-use, and how this data will be curated and preserved and will be developed at the end of the project. The purpose of the data management plan within REPAiR is to support the data management life cycle for all data that will be collected, processed or generated.
D8.12 : Dissemination and exploitation report [48] Final report on dissemination and exploitation of project results.

Schedule of relevant Milestones

Milestone number ¹⁸	Milestone title	Lead beneficiary	Due Date (in months)	Means of verification
MS29	REPAiR website	6 - IGiPZ	2	Draft REPAiR website up and running.
MS30	Dissemination kit	6 - IGiPZ	3	Basic dissemination kit ready to use.

Schedule of relevant Milestones

Milestone number ¹⁸	Milestone title	Lead beneficiary	Due Date (in months)	Means of verification
MS31	Final Seminar	6 - IGiPZ	46	A final event will be organised.

Work package number ⁹	WP9	Lead beneficiary ¹⁰	1 - TUD
Work package title	Ethics requirements		
Start month	1	End month	48

Objectives

The objective is to ensure compliance with the 'ethics requirements' set out in this work package.

Description of work and role of partners

WP9 - Ethics requirements [Months: 1-48]

TUD

This work package sets out the 'ethics requirements' that the project must comply with.

List of deliverables

Deliverable Number ¹⁴	Deliverable Title	Lead beneficiary	Type ¹⁵	Dissemination level ¹⁶	Due Date (in months) ¹⁷
D9.1	POPD - Requirement No. 7	1 - TUD	Ethics	Confidential, only for members of the consortium (including the Commission Services)	2
D9.2	H - Requirement No. 6	1 - TUD	Ethics	Confidential, only for members of the consortium (including the Commission Services)	2
D9.3	H - Requirement No. 5	1 - TUD	Ethics	Confidential, only for members of the consortium (including the Commission Services)	2
D9.4	H - Requirement No. 4	1 - TUD	Ethics	Confidential, only for members of the consortium (including the Commission Services)	2
D9.5	POPD - Requirement No. 3	1 - TUD	Ethics	Confidential, only for members of the consortium (including the Commission Services)	2
D9.6	H - Requirement No. 2	1 - TUD	Ethics	Confidential, only for members of the consortium	2

List of deliverables

Deliverable Number ¹⁴	Deliverable Title	Lead beneficiary	Type ¹⁵	Dissemination level ¹⁶	Due Date (in months) ¹⁷
				(including the Commission Services)	
D9.7	POPD - Requirement No. 1	1 - TUD	Ethics	Confidential, only for members of the consortium (including the Commission Services)	2

Description of deliverables

The 'ethics requirements' that the project must comply with are included as deliverables in this work package.

D9.1 : POPD - Requirement No. 7 [2]

Copies of opinion or confirmation by the competent Institutional Data Protection Officer and/or authorization or notification by the National Data Protection Authority must be submitted (which ever applies according to the Data Protection Directive (EC Directive 95/46, currently under revision, and the national law).

D9.2 : H - Requirement No. 6 [2]

Templates of the informed consent forms and information sheet must be submitted on request.

D9.3 : H - Requirement No. 5 [2]

Detailed information must be provided on the informed consent procedures that will be implemented for the participation of humans.

D9.4 : H - Requirement No. 4 [2]

Details on the procedures and criteria that will be used to identify/recruit research participants must be provided.

D9.5 : POPD - Requirement No. 3 [2]

Detailed information must be provided on the procedures that will be implemented for data collection, storage, protection, retention and destruction and confirmation that they comply with national and EU legislation.

D9.6 : H - Requirement No. 2 [2]

The applicant must clarify whether vulnerable individuals/groups will be involved. Details must be provided about the measures taken to prevent the risk of enhancing vulnerability/stigmatisation of individuals/groups.

D9.7 : POPD - Requirement No. 1 [2]

Detailed information on the informed consent procedures that will be implemented in regard to the collection, storage and protection of personal data must be submitted on request.

Schedule of relevant Milestones

Milestone number ¹⁸	Milestone title	Lead beneficiary	Due Date (in months)	Means of verification

1.3.4. WT4 List of milestones

Milestone number ¹⁶	Milestone title	WP number ⁹	Lead beneficiary	Due Date (in months) ¹⁷	Means of verification
MS1	Catalogue of minimum requirements for the GDSE	WP2	11 - GGR	4	A Catalogue of minimum requirements for the GDSE agreed on by the project board
MS2	Detailed technical concept for each GIS-based components	WP2	11 - GGR	10	Detailed technical concept for each GIS-based component, taking into account the specific requirements as well as existing data and models of each of the six geodesign projects. Delivered in form of a report.
MS3	Programmed modules for the two pilot applications in Naples and Amsterdam	WP2	11 - GGR	14	A ready-to-use beta version of Programmed modules for the two pilot applications in Naples and Amsterdam.
MS4	Geodesign workshop Amsterdam	WP2	1 - TUD	25	Geodesign workshops with stakeholders in the case of Amsterdam. As final event of every case study, one geodesign session will be held with the aim of developing one agreed resource management strategy.
MS5	Geodesign workshop Naples	WP2	3 - UNINA	26	Geodesign workshops with stakeholders in the case of Naples. As final event of every case study, one geodesign session will be held with the aim of developing one agreed resource management strategy.
MS6	Geodesign workshop Ghent	WP2	2 - UGENT	32	Geodesign workshops with stakeholders in the case of Ghent. As final event of every case study, one geodesign session will be held with the aim of developing one agreed resource management strategy
MS7	Geodesign workshop Łódź	WP2	6 - IGiPZ	35	Geodesign workshops with stakeholders in the case of Łódź. As final event of every case study, one

Milestone number ¹⁵	Milestone title	WP number ⁹	Lead beneficiary	Due Date (in months) ¹⁷	Means of verification
					geodesign session will be held with the aim of developing one agreed resource management strategy.
MS8	Geodesign workshop Hamburg.	WP2	4 - HCU	38	Geodesign workshop with stakeholders in Hamburg. As final event of every case study, one geodesign session will be held with the aim of developing one agreed resource management strategy.
MS9	Geodesign workshop Pécs	WP2	5 - RKI	41	Geodesign workshops with stakeholders in Pécs. As final event of every case study, one geodesign session will be held with the aim of developing one agreed resource management strategy.
MS10	Definition of system boundaries and goals and data assessment	WP3	1 - TUD	10	Definition of system boundaries and goals and data assessment of core material flows and subcategories, spatial qualities, social aspects from the two pilot studies agreed on by the project board.
MS11	Questionnaire for Household and Companies Surveys	WP3	5 - RKI	10	Elaborated questionnaire for T-3.3 surveys ready to use and agreed on by the project board.
MS12	Preliminary representation and process models	WP3	1 - TUD	13	Preliminary representation and process models ready to be integrated into GDSE. First maps and data bases delivered in order to test within the GDSE
MS13	Validation of Pilot Study Models	WP3	1 - TUD	19	Validation of the methodology and calibration of models from the 2 pilot studies agreed on by the project board in order to prepare models for the follow up studies.
MS14	Benchmark of available data versus existing indicator	WP4	2 - UGENT	8	Benchmark of available data versus existing indicator framework ready

Milestone number ¹⁶	Milestone title	WP number ⁹	Lead beneficiary	Due Date (in months) ¹⁷	Means of verification
					and agreed on by the project board.
MS15	Possibilities of sustainability assessment at regional level	WP4	7 - JRC	12	Possibilities analysed of sustainability assessment at regional level and agreed on by the project board.
MS16	Test of framework for assessment	WP4	2 - UGENT	12	Test of assessment framework in the pilot cases ready and applied during workshop with stakeholders.
MS17	Handbook Sustainability Assessment	WP4	2 - UGENT	26	Handbook for sustainability assessment in the repair project ready and available on the project webpage
MS18	Preparation of Pilot Pulls	WP5	3 - UNINA	5	Definitive location, organizational settings and educational outline for two pilot PULLs. Amsterdam and Naples ready and agreed on by the project board. Facilitation of PULLs secured.
MS19	International Student Workshops	WP5	1 - TUD	21	International student workshops bringing together the multidisciplinary teams from both pilot cases (month #13 and #21) WS took place and outputs are documented on the project webpage.
MS20	First Set of solutions for pilot cases	WP5	3 - UNINA	15	First set of solutions for a selection of challenges in pilot cases is ready for testing the GDSE.
MS21	Organizational settings of PULLs for follow-up studie	WP5	3 - UNINA	15	Definitive location and organizational settings of PULLs for follow-up studies ready and agreed on by the project board and facilitation of PULLs is secured.
MS22	Student Presentation follow up Pulls	WP5	3 - UNINA	31	Final presentation and evaluation of student work of the follow-up PULLs. (months #22, 25, 28, 31). Presentations took place in front of members of the consortium and key stakeholders of the area.

Milestone number ¹⁶	Milestone title	WP number ⁹	Lead beneficiary	Due Date (in months) ¹⁷	Means of verification
					Results documented on the project webpage.
MS23	List of key priorities of stakeholders in pilot cases	WP6	4 - HCU	6	First list of key priorities of stakeholders in pilot studies available and ready to be integrated into GDSE testing.
MS24	Draft decision models for pilot studies	WP6	1 - TUD	10	Draft decision models for GDSE developing in pilot studies. Decision models integrated into GDSE for testing.
MS25	Key priorities of stakeholders in follow-up studies	WP6	4 - HCU	12	First list of key priorities of stakeholders in follow-up studies ready to be integrated into GDSE.
MS26	Draft decision models for follow-up studies	WP6	4 - HCU	24	Draft decision models in follow-up studies ready to be integrated into the GDSE.
MS27	Knowledge Transfers Events	WP7	1 - TUD	31	Organizing and conducting knowledge transfers events as part of PULLs. (months #13 ,17, 22, 25, 28 and 31)
MS28	methodology for knowledge transfer	WP7	5 - RKI	22	Draft methodology for knowledge transfer ready and agreed on by the project board.
MS29	REPAiR website	WP8	6 - IGiPZ	2	Draft REPAiR website up and running.
MS30	Dissemination kit	WP8	6 - IGiPZ	3	Basic dissemination kit ready to use.
MS31	Final Seminar	WP8	6 - IGiPZ	46	A final event will be organised.

1.3.5. WT5 Critical Implementation risks and mitigation actions

Risk number	Description of risk	WP Number	Proposed risk-mitigation measures
R1	Involvement of illegal organisations in 'waste management' specifically in the case of Naples. a) Official data on waste are incorrect. b) Security of researchers during fieldwork has to be guaranteed.	WP3, WP5, WP6	At a) Data has to be verified through fieldwork and waste and soil analyses have to be performed. Consortium partners have the necessary expertise and equipment At b) Local partners are familiar with the situation and are able to assess the risk of specific situations. If necessary, specific security measure will be taken.
R2	Project time line and teaching schedules of universities may not coincide with the project start. Which may cause delays in setting up the pilot PULLs.	WP2, WP5	The pilot PULLs have a modular structure and are iterative; if the first module cannot take place as planned, it can be replaced by shorter workshops, or even completely omitted without having major negative impacts on the final outcome.
R3	Partners that drop out	WP1, WP2, WP3, WP4, WP5, WP6, WP7, WP8	Strict governance mechanisms Key expertise are redundant
R4	Partner communication problem	WP1, WP2, WP3, WP4, WP5, WP6, WP7, WP8	Team building efforts like common vision building at the beginning, intensive face to face contacts during the PULLs.
R5	Experts leaving the consortium/personal changes	WP1, WP2, WP3, WP4, WP5, WP6, WP7, WP8	Redundancy of experts in WPs; Quick replacements in consultation with EC
R6	Interdependencies between WPs	WP1, WP2, WP3, WP4, WP5, WP6, WP7, WP8	Develop back up plans Multiple people in multiple WPs – most partners involved in all WPs - Lead partner involve in all WPs
R7	Financial Risks	WP1, WP2, WP3, WP4, WP5, WP6, WP7, WP8	Careful monitoring of estimation and expenditure; RE-assessment of priorities for budget/resources

1.3.6. WT6 Summary of project effort in person-months

	WP1	WP2	WP3	WP4	WP5	WP6	WP7	WP8	WP9	Total Person/Months per Participant
1 - TUD	21.50	17	15	12	17	4.70	10	12		109.20
2 - UGENT	0.50	2	12	26	5.50	1	3.20	3		53.20
3 - UNINA	1	3	11	3	33	1	5.20	4.10		61.30
4 - HCU	0.50	5	9	2	2	18	4.20	2.10		42.80
5 - RKI	0.50	4	22	10	9	20	20	4.60		90.10
6 - IGIPZ	0.50	3	13	10	9	2.40	7.10	13.10		58.10
7 - JRC	0	1	10	24	5	0.70	0.40	6.10		47.20
8 - Geo-Col	0	10	2	2	2.50	0.70	0.40	1.10		18.70
9 - Delta	0	1	1	1	3	2	1	1.60		10.60
10 - BIOKOM	0	1	1	1	3	0.70	3.40	3.10		13.20
11 - GGR	0	29	1	2.50	1	0.40	0.40	2.60		36.90
12 - OVAM	0	1	1	3	3	4	0.40	1.60		14
13 - GHM	0	1	1	0	3.50	1	0.40	1.10		8
14 - CAMPANIA	0	1	1	0	6	1	0.40	1.10		10.50
15 - PHH	0	1	1	1	5	1	0.40	1.10		10.50
16 - BAUER	0	1	1	1	3	0.70	0.40	1.10		8.20
17 - IVAGO	0	1	1.50	0.50	3	1	0.40	1.10		8.50
18 - SRH	0	1	1	1	3.50	1	0.40	1.10		9
Total Person/Months	24.50	83	104.50	100	117	61.30	58.10	61.60		610

1.3.7. WT7 Tentative schedule of project reviews

Review number ¹⁹	Tentative timing	Planned venue of review	Comments, if any
RV1	16	to be confirmed	
RV2	32	to be confirmed	
RV3	48	to be confirmed	

1. Project number

The project number has been assigned by the Commission as the unique identifier for your project. It cannot be changed. The project number **should appear on each page of the grant agreement preparation documents (part A and part B)** to prevent errors during its handling.

2. Project acronym

Use the project acronym as given in the submitted proposal. It can generally not be changed. The same acronym **should appear on each page of the grant agreement preparation documents (part A and part B)** to prevent errors during its handling.

3. Project title

Use the title (preferably no longer than 200 characters) as indicated in the submitted proposal. Minor corrections are possible if agreed during the preparation of the grant agreement.

4. Starting date

Unless a specific (fixed) starting date is duly justified and agreed upon during the preparation of the Grant Agreement, the project will start on the first day of the month following the entry into force of the Grant Agreement (NB : entry into force = signature by the Commission). Please note that if a fixed starting date is used, you will be required to provide a written justification.

5. Duration

Insert the duration of the project in full months.

6. Call (part) identifier

The Call (part) identifier is the reference number given in the call or part of the call you were addressing, as indicated in the publication of the call in the Official Journal of the European Union. You have to use the identifier given by the Commission in the letter inviting to prepare the grant agreement.

7. Abstract

8. Project Entry Month

The month at which the participant joined the consortium, month 1 marking the start date of the project, and all other start dates being relative to this start date.

9. Work Package number

Work package number: WP1, WP2, WP3, ..., WPn

10. Lead beneficiary

This must be one of the beneficiaries in the grant (not a third party) - Number of the beneficiary leading the work in this work package

11. Person-months per work package

The total number of person-months allocated to each work package.

12. Start month

Relative start date for the work in the specific work packages, month 1 marking the start date of the project, and all other start dates being relative to this start date.

13. End month

Relative end date, month 1 marking the start date of the project, and all end dates being relative to this start date.

14. Deliverable number

Deliverable numbers: D1 - Dn

15. Type

Please indicate the type of the deliverable using one of the following codes:

- R Document, report
- DEM Demonstrator, pilot, prototype
- DEC Websites, patent filings, videos, etc.
- OTHER
- ETHICS Ethics requirement

16. Dissemination level

Please indicate the dissemination level using one of the following codes:

PU Public
 CO Confidential, only for members of the consortium (including the Commission Services)
 EU-RES Classified Information: RESTREINT UE (Commission Decision 2005/444/EC)
 EU-CON Classified Information: CONFIDENTIEL UE (Commission Decision 2005/444/EC)
 EU-SEC Classified Information: SECRET UE (Commission Decision 2005/444/EC)

17. Delivery date for Deliverable

Month in which the deliverables will be available, month 1 marking the start date of the project, and all delivery dates being relative to this start date.

18. Milestone number

Milestone number: MS1, MS2, ..., MSn

19. Review number

Review number: RV1, RV2, ..., RVn

20. Installation Number

Number progressively the installations of a same infrastructure. An installation is a part of an infrastructure that could be used independently from the rest.

21. Installation country

Code of the country where the installation is located or IO if the access provider (the beneficiary or linked third party) is an international organization, an ERIC or a similar legal entity.

22. Type of access

VA if virtual access,
 TA-uc if trans-national access with access costs declared on the basis of unit cost,
 TA-ac if trans-national access with access costs declared as actual costs, and
 TA-cb if trans-national access with access costs declared as a combination of actual costs and costs on the basis of unit cost.

23. Access costs

Cost of the access provided under the project. For virtual access fill only the second column. For trans-national access fill one of the two columns or both according to the way access costs are declared. Trans-national access costs on the basis of unit cost will result from the unit cost by the quantity of access to be provided.

Version	Date	Description of change
02	22-12-2015	Update of table 3,4b other cost, included auditing cost and corrected errors; in accordance with document financial and legal matter from 21-12-2015
	10-01-2016	Chapter 4.1 – stated clearly the employment relations of key personal.
	12-01-2016	Adapted chapter 5.2 ethics in response to Ethics Summary Report -
03	09-02-2016	Additional change to chapter 5.2 ethics in response to Ethics Summary Report
	09-02-2016	Adaptation of 2.2.5 Research data and knowledge management to fulfil requirements of the open Research Data pilot.
	11-02-2016	Added additional description of key personal involved – to respond to the comment of limited gender studies competence in the consortium.
04	29-03-2016	Changes to chapter 3.4 and related tables Resources to be committed in accordance to comments from MS Rogival and the now better defined role of the 3TU Datacentre
	29-03-2016	Update of key personal involved Bauer
05	30-03-2016	Correcting tables 3.4b and describing subcontracting in chapter 4.2

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2 Excellence

1.1 Objectives

The core objective of REPAiR is to provide local and regional authorities with an innovative **geodesign decision support environment** (GDSE) that will be used to create integrated, place-based eco-innovative spatial development strategies promoting the use of **waste as a resource**. GDSE draws on the concept of geodesign (Steinitz, 2012, Campagna, 2014) and will be developed and implemented in **living labs** (Mitchell 2003, Bilgram et al., 2008). The strategies produced using GDSE will support the ongoing initiatives of the European Commission towards establishing a strong **circular economy** (CE) in Europe (EC, 2011a, 2014b). To this end, and as supported by current EU waste management legislation, eco-innovative strategies are based to the greatest extent possible on **life cycle thinking** (LCT), thus ensuring that all lifecycle stages are considered, while avoiding burden shifting.

1.1.1 Background

In the European Union (EU), 16 tonnes of material are used per person per year. The inflows that stay in urban areas become part of the urban ecosystem in the form of landfills, wastewater treatment plants, and physical infrastructure, while the outflows of urban spaces are exported back to the hinterlands and distant localities as pollutants and consumer products. Research in industrial ecology and related fields have framed these material and energy inflows and outflows as a city's 'urban metabolism' (UM). In the EU, out of these 16 tonnes, 6 tonnes become waste (EC, 2010). This waste production indicates the **limited ability to use resources efficiently** both in their transformation into consumer goods and waste's transformation back into valuable resources. Moreover, waste production results in competition for water and land use, increasing risks of adverse environmental effects such as climate change and ecosystem toxicity, and finally reduces quality of life.

About 60 percent of the land used to meet the EU's consumption demand is located outside its territory. Europe is **thus the continent most dependent on land and resources beyond its borders** to sustain its consumption patterns, agricultural industry, and energy demands (Unmüßig et al., 2015). Transitioning towards a more circular economy is crucial to delivering the resource efficiency agenda established under the *Europe 2020 Strategy for smart, sustainable, and inclusive growth*. The recently withdrawn amendment of the EU Commission's Directives on Waste (2008/98/EC), Packaging, Landfill, and other wastes had foreseen concrete goals for the recycling and preparing for re-use of **municipal waste**, as well as a variety of other waste fractions, and moreover the **phasing out of landfills**. REPAiR develops, in this phase of reshaping policies towards a CE, the possibility for public and private local actors to **simulate and assess projects, policies and spatial plans towards a more circular economy**.

A resource-efficient Europe can only be achieved with 'a **policy mix that optimises synergies and addresses trade-offs** between different areas and policies' (EC, 2011a). Thus, local authorities, citizens, and other stakeholders need a **collaborative and science-informed decision environment** that allows for developing different waste and resource management options and assessing their impacts on **environmental resilience, spatial quality and the quality of life**. Conducting robust assessments of options for improving waste and resource management in the EU is essential, but '**the availability of data remains a key challenge**' (UNECE, 2014). Ideally, waste management data should include variables affecting complex system behaviour in order to understand the relationships between socio-economic and environmental dynamics and the built environment, making the concept of urban metabolism more applicable.

Therefore, the key innovations of this project are the integration of **dynamic resource flow modelling**, resource allocation together with **urban and regional planning**, and **human behavioural aspects**. REPAiR uses six peri-urban regions across Europe to develop, test and implement a GDSE as a tool for devising place-specific solutions to enhance resource efficiency and urban metabolism.

REPAiR focuses on peri-urban areas, landscapes characterised by a patchwork of dispersed urbanised areas, agricultural land, open space and high density residential areas within a discontinuous countryside. This focus is underpinned by DG Regio's statements in *Cities of Tomorrow* (EC, 2011b), which pinpoints problems for sustainable urban development like urban sprawl and extensive land consumption, fragmented local governments and planning systems as well as **excessive use of resources and waste production** in peri-urban areas. Peri-urban areas are particularly relevant as a source of problems, but their **specific spatial configurations** also offer a range of possibilities to establish a CE. Moreover, the presence of both urban, rural and hybrid spatial characteristics allows for developing eco-innovative strategies that are



transferable to rural as well as urban areas. For example, the local and regional economic networks of small and medium sized enterprises (SMEs) in the fields of manufacturing, creativity, design, telecommunications, energy and environmental technologies - key characteristics of peri-urban areas - provide REPAiR the possibility to support a strong, competitive, and diversified manufacturing and value chain in the spirit of the "Innovation Union" of the European Commission 2010 (EC 2010b)

The concept of Urban Metabolism is particularly strong in supporting improvements in urban and regional planning. It can, in fact, be used to develop policy support tools capable of assessing the impact of development scenarios against normative ideas on sustainable development. This applies not only in energy and resource use terms, but also in relation to most technical and socio-economic processes in urbanised territories related to growth, the production of energy and products, elimination of waste as well as to related spatial qualities and the quality of life. In order to make the concept of urban metabolism more effectively implementable, REPAiR addresses the main shortcomings of earlier UM approaches.

Figure 1.34 Waste Geographies and Circular Features in Peri-urban areas

- First, it accentuates the inner workings of the case study areas, rather than treating them as black boxes for general input-output accounting. By choosing subparts of metropolitan regions as the smallest scales of the system, REPAiR examines the processes that drive the transformation of resources into products, services and waste, as well as their impacts. Related to this is the choice and selection of sustainability indicators to be driven by the decision needs of key actors and not by data availability.
- Secondly, by concentrating on peri-urban areas, the interlinkages between the urban form and metabolic processes are brought to the foreground. The need to do so was highlighted as one of the key areas for further research by the SUME project. Overcoming the methodological barriers among industrial ecology and spatial planning and design is crucial to achieve this linkage. REPAiR therefore aims to integrate material flow analyses and lifecycle analyses into spatial models and planning policies.
- Thirdly, REPAiR uses a sociometabolic perspective, which does not reduce UM to an accounting exercise of gigatons and megajoules, but embraces existing knowledge, creativity and capabilities to redesign, invent and test strategies for a circular economy in living labs across Europe to achieve a more sustainable future. In this way, REPAiR will contribute to preventing waste generation and promoting the use of waste as a resource in order to enhance the natural and living environments.

In short, REPAiR focuses on how the design of physical structures and their social and urban metabolisms, including health, economy, well-being and happiness, are affected by material flows and their environmental impacts and will thereby contribute to improving the quality of life in Europe and building a greener society.

1.1.2 Summary of project objectives

The key challenge for REPAiR is to integrate models and methods from, among others, the environmental sciences, geographic sciences and economic sciences with design and spatial planning methods, both on a software and process level. The integrated models and methods will enable local and regional stakeholders to use the GDSE within a workshop setting to develop fast and reliable alternatives for spatial sustainable development strategies. The main objective of REPAiR is to demonstrate the feasibility and validity of the GDSE as a tool for enhancing waste and resource management. To successfully develop, test and implement the GDSE, the following project objectives have been defined:

- To provide decision-makers with comparative assessments of different integrated spatial resource management strategies (WP2, WP6) by combining forecasting methods (WP4), strategy conceptualisations (WP5) and an integrated assessment of economic, environmental and social sustainability in a collaborative decision support environment (WP4).

- To develop an understanding of the characteristics, mechanisms and dynamics of European resource management systems by analysing the relations between waste flows, environmental and spatial quality, allocation and governance in six peri-urban areas using life cycle thinking (WP3).
- To better interpret the link between metabolic flows and urban processes, by extending the assessment of urban metabolism to include urban driver concepts and urban patterns, as well as environmental and spatial quality, and co-benefits (WP3, WP4).
- To improve the knowledge and reliability of waste related data by reversed material flow accounting (WP3).
- To implement living labs in peri-urban areas across Europe in order to develop, test, implement and assess place-specific eco-innovative solutions for resource management to improve environmental and spatial quality and quality of life (WP2, WP5).
- To understand decision making structures and processes in the case study areas with regard to interests and priorities of different stakeholders in order to add transparency to the decision making process (WP6).
- To develop a framework for transferring (a) the key modules of the GDSE itself; and, (b) the solutions and change models that it will produce across differentiated peri-urban areas (WP7).
- To disseminate and ensure the further uptake of the project's insights on aspects of resource management and GDSE development by including local and regional planning authorities, NGOs, public and private waste management companies, and future urban planners in the project. Moreover, open dissemination of insights, tools and technologies is provided across Europe, establishing the foundation for knowledge-based consultancy services that support local implementation of policies and spatial investments aimed at developing a circular economy (WP8, WP2).

The REPAIR consortium consists of a good balance of partners from the case areas. The REPAIR consortium members can rely on their expertise in waste and resource management, spatial decision support, territorial governance, spatial planning and urban design. Moreover, the members have profound knowledge of the six case study areas. This allows us to develop a GDSE that is scientifically sound, apt for local decision makers and adaptable enough to be used in different locations. Together with the members of the user board, the entire REPAIR team comprises a complete range of representatives of the major stakeholders in all the metropolitan regions involved. The REPAIR user board includes key stakeholders for the development of a circular economy like planning authorities and public/private organisations involved in the strategic environmental assessment, and NGOs and industrial actors in waste and resource management.

1.2 Relation to the Work Programme

The key challenges formulated in the work programme are **boosting eco-innovative solutions to prevent waste generation and promote the use of waste as a resource**. The aim is to enhance the natural and living environment in urban and peri-urban areas and assure that **developing and demonstrating eco-innovative solutions in real-life environments will enhance their market uptake and contribute to sustainable urbanisation worldwide**. Table 1.1 gives an overview of how REPAIR address the general as well as the specific challenge of the call.

Table 1.2a Contribution of REPAIR to the call objectives. WASTE-GO 2016 issue b) Eco-innovative strategies

Specific Challenge	REPAIR response
Prevent waste generation and promote waste as resource	Identify and combine quantitative and qualitative information on material flow dynamics as well as the localisation of symbiotic relationships enabling local stakeholders to develop waste prevention strategies supporting a circular economy.
Enhance natural and living environments	Optimise urban and regional infrastructures and living environments in (peri-) urban areas through a CE based on the smart clustering of solutions to improve resource metabolism and spatial quality, consequently securing both social and spatial values (liveability), as well as environmental, economic and cultural values (prosperity).
Eco-innovative solution in real life environment	The 'living lab' approach provides a real-life test for the GDSE in six highly relevant case study areas. I.e. setting up pilot projects for better separation, collection and treatment of the organic waste fraction of household waste or increasing the sustainability of newly (re-)developed industrial areas by applying a circular economy approach.

Specific Challenge	REPAIR response
Understand the growing waste as a valuable stock of resources	Development of a method for inventorying waste flows via an improved spatial-environmental approach to waste as resource through agent-based smart clustering, supporting innovative governance and business models. An in-depth inventory of waste flows and stocks in six European peri-urban areas will be developed, along with an evaluation of the inventory's related economic, environmental, spatial and social potentials.
Scope	REPAIR response
Integrated urban metabolism approach (interdisciplinary, innovation and gender related aspects)	The proposed geodesign approach is strongly interdisciplinary. By putting design solutions at the core of the decision process, innovation and adoption in the case study areas can be guaranteed; by (1) securing women's participation in the research activities and (2) by investigating and considering gender-nuanced patterns of resource use and consumption, decision-making and public governance.
Engage local authorities, citizen and other relevant stakeholders	All stakeholder groups as determined by Freeman (1999) are represented in the activities, both as partners in the consortium and in the user board. 'Living lab' as research approach that facilitates public-private-people partnerships in order to integrate current research and innovation processes in a user-centred, open-innovation ecosystem operating in a wider territorial context.
Specific Scope (Issue b)	REPAIR response
Development of strategies for waste prevention	Development of six collaboratively developed integrated resource management strategies for the case study areas and a framework for strategy development and software modules transferable to other metropolitan areas in Europe and abroad.
Urban metabolism in relation to urban patterns, consumer behaviour, lifestyle, culture and socio-economic issues	Utilising the specific socio spatial configuration of peri-urban areas to enable smart and sustainable use of resources, while improving spatial and socio economic issues. To this aim, REPAiR combines quantitative and qualitative research and adds spatial quality and innovative governance and business models to the concept of urban metabolism.

1.3 REPAIR's Concept and Approach

1.3.1 REPAIR's overall concept

REPAiR applies - for the first time - a **geodesign approach including waste and resource management** in order to reveal the local space-specific challenges of waste and resource management using life cycle analyses (LCA) and UM. Campagna (2014) defines geodesign as 'an integrated process informed by environmental sustainability appraisal, which includes project conceptualisation, analysis, projection and forecasting, diagnosis, alternative design, impact simulation and assessment, and which involves a number of **technical, political and social actors** in collaborative decision-making'. The advances of geodesign compared to older landscape and environmental planning approaches are threefold. It allows for (1) an **extensive use of digital data in design, evaluation and communication**; (2) gives a **prominent role to design, by developing spatial solutions to specific place-based (*genius loci*) problems**; and (3) its **transdisciplinary nature calls for collaboration**.

REPAiR adapts Carl Steinitz's (2012) geodesign framework, comprising six questions (see Figure 1.3b) that are asked at, at least three points in a geodesign project: (1) to understand the study area, (2) to specify the methods and (3) to perform the study. The answers to Steinitz's questions are six models of current functions and performance, as well as possible future alterations to a specific area. The models build the components of the GSDE in terms of software solutions and the decision-making process, and reflect the work package structure of REPAiR.

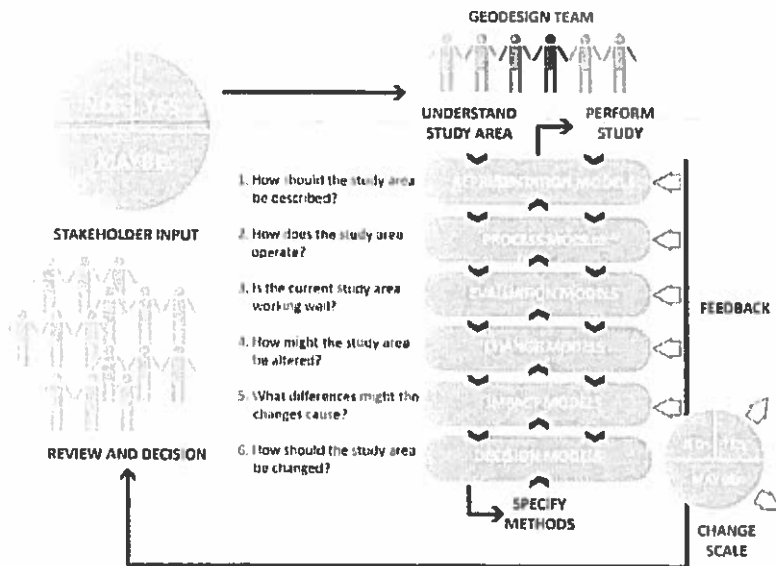


Figure 1. The six questions and three iterations of the REPAIR geodesign framework (in reality the progress is much more iterative).

Using Steinitz's framework has distinctive advantages. First, the use of methods and data is decision-driven; representing local waste prevention and resource management challenges, and the specific needs of the actors involved. Second, the change models comprise designs of several solutions to specific challenges, tested in real-life environments. The designs involve urban design, planning, policy-making and governance, triggering a collective planning process. Third, the

collected data represent relevant scale(s) and detail levels. Fourth, case-specific, relevant sustainability indicators are revealed. Finally, using the framework triggers a transparent decision-making process.

An extended Urban Metabolism Approach

REPAiR integrates life cycle thinking and geodesign to operationalise urban metabolism (UM). UM describes the continuous flows of energy, resources, waste, information and people into, out of, and within any given metropolitan area. It considers the area as interacting subsystems, permanently adapting to political, economic and natural environments. The UM concept has *inter alia* been used as an analytical tool to examine the energy and material exchanges 'between cities and the rest of the world' (Fischer-Kowalski, 2002). In other words, UM is a framework for modelling complex urban systems' material and energy streams as if the city were an ecosystem. Using this framework enables studying the dynamics of cities in relation to scarcity, carrying capacity, and conservation of mass and energy (Newman et al., 2009). REPAiR builds on the extended UM approaches (e.g. Minx et al. 2011, Schremmer et al. 2011, Pincell et al. 2012), in which urban subsystems with their environmental and spatial impacts are addressed more explicitly. REPAiR also builds upon the notion of *synergism* in UM studies, focusing on the benefits of the intrinsic relationships existing within the urban metabolic system (Zhang et al. 2014).

Waste as Resource

REPAiR's understanding of UM facilitates the shift to seeing waste as a resource, while determining the implications of this shift and exploring ways to tackle it. Therefore, REPAiR does not focus on 'end-of-pipe' potential alone, but traces waste flows back to resource consumption patterns. This is essential for two reasons: (1) the role of consumption behaviour in sustainable urban development is still insufficiently studied; and (2) this approach enables estimating the best possible change routes towards a circular economy. An adequate classification of waste, fitting all European waste management policies and regulations, is required for this purpose. While a definition of waste is provided within the Waste Framework Directive (2008/98/EC) and includes by-products and end-of-waste criteria, (see e.g. EC (2011c)), REPAiR offers an outstanding contribution to these efforts by including technological and social developments, both up and downstream, and defining if, when and where waste becomes a resource. REPAiR addresses five preliminary flow categories: construction & demolition waste, biowaste, post-consumer plastic waste, electrical waste and electronic equipment, and municipal solid waste. Along the project's trajectory, other flows may emerge as priorities in each case study area, such as post-industrial waste or medical waste. Furthermore, REPAiR innovates by focusing on 'wasted landscapes' (WL), which apply to open spaces as well as built entities, like buildings and infrastructure.

The Transdisciplinary Approach

The geodesign approach is by definition transdisciplinary. REPAiR uses two key strategies to achieve a successful transdisciplinary working environment. First, the first six months of the project are allocated to developing a shared understanding of key concepts and methods used to develop the GDSE. Specific deliverables are a joint vision of the

GDSE and methodological handbooks. Second, REPAiR uses peri-urban living labs (PULLs), which integrate the research and teaching activities related to REPAiR with the activities of local consortium partners. In situ development of strategies for a circular economy (CE) within multidisciplinary teams will enforce the transdisciplinary collaboration.

1.1.2 Positioning REPAiR in relation to Technology Readiness level (TRL) and Societal Relevance Level (SRL)

The core product developed by REPAiR is a GDSE, combining and further developing existing simulation modelling, assessment tools and spatial decision support systems and other commonly used tools (CAD, GIS, BIM and system dynamics). Moreover, REPAiR develops some new 'best practice' techniques, such as object-oriented diagrams or interactive touch-enabled interfaces. A key challenge is to integrate collaborative approaches and design capabilities into these tools. So far, few geodesign decision environments have been developed and none of them focuses on integrating waste management with spatial analyses.

Common limitations of current geodesign systems include a lack of full decision-process support, stakeholder selection based on decision stages, trans-disciplinary communication and learning, and integration of design and analysis tasks. Several consortium members (Geo-Col, GGR, TUD, UG, IGiPZ, JRC) have experience developing geodesign systems or traditional (spatial) decision support systems. Using the experience of the consortium partners, REPAiR addresses these limitations by developing and providing a trans-disciplinary platform that offers stage-specific support, with modules that combine design tasks with analytical models in the context of waste and resource management.

The software products used for the GDSE have primarily been delivered by ESRI (US leader of commercial GIS software). REPAiR innovates in this respect by adopting an open source approach in the development of the different modules of the GDSE and connecting them with existing open source LCA databases and DSS like open LCA. REPAiR also develops several comprehensive eco innovative solutions from ideas from strategy implementation, to scenarios and simulations.

Table 1.34 Key technologies, concepts and policies dealt with by REPAiR and their expected changes in technological readiness and societal relevance level following McCarthy (2013).

Technology / Concept / Policy	Current TRL/SRL level	Post REPAiR TRL/SRL level
Methodological Improvements		
Geodesign decision support environment	Experimental proof of concept	Integrated design capabilities and tested in relevant multi actor environment. (TLR 7)
Urban metabolism	Concept applied to metropolitan system	Concept applied to subsystems of metropolitan areas and related to urban planning and design
Circular economy	Applied to cradle to cradle products	Tested and assessed on business park development
Reversed material flow accounting	Applied to pilot studies for single waste streams	Standardised application for several waste streams in relation to urban planning and design
Planning in peri-urban areas	Fragmented planning systems	Piloting integrated spatial planning in living labs
UM related sustainability indicators	Focus on whole economy	Indicator set integrating economy-wide and local indicators.
Exemplary Eco Innovative Strategies		
Ghent – Increase of energy-efficient renovations from 1500 to 3000 buildings per year and improve the separate collection and recycling rate of glass and mineral wool waste	Policy agreement	Simulated and assessed in a wider policy and spatial development arena with a variety of stakeholders
Haarlemmermeer - Development of a circular economy business park	Initial development phase	Simulated, evaluated and assessed CE business park in a wider policy and spatial arena with a variety of stakeholders
Naples - The Covenant for the Land of	Initial funding scheme and proposal	Simulated, assessed and partly

Fires was signed, allocating resources for Naples metropolitan area to improve territorial control and environmental protection	of a prevention bill	implemented integrated approach using UM methodology to link land remediation and recovery projects to land use planning with various stakeholders
Pécs - Exceeding the increase and optimisation of recycling (rate) of household waste, the concept is to maximise avoidance of disposal.	Renewed recycling and disposal system. (30% of recycling rate)	Alternative technologies in use instead of disposal (recycling and e.g. energetic use, pyrolysis). 50% or higher recycling rate
Łódź – Development of a planning policy for the city (structural and land use plans) with particular focus on limiting suburbanisation.	Planning system works but focuses on land use regulation. Strong pressure on agricultural land. Limited urbanisation demand causes fallow agricultural lands.	Integrated approach to link land use planning to management strategies for disused agricultural lands via collective UM methodologies.
Hamburg - Development of methods to increase bio-waste recycling rates in private households and improve bio-waste cycles in horticulture enterprises and tree nurseries.	Bio-waste recycling is introduced to households, but the percentage is limited. Bio-waste cycles only closed in a limited way.	Developed and implemented methods to introduce bio-waste recycling to all household types. Developed methods to improve bio-waste cycles.

1.1.3 Activities Linked to REPAIR

It is essential to be aware of and use knowledge obtained in the past and current national and international research projects in the fields relevant for REPAIR. A selection of related projects is summarised in Table 3, including the REPAIR consortium members involved in the project.

Table 3.3b Selection of key projects by partners in most recent years.

Project	Funding Framework	Input for / Synergy with REPAIR	Involved REPAIR Partner
SUME	FP7	Sustainable Urban Metabolism in Europe –relating UM with urban patterns	TUD
Better Airport Regions (BAR)	NWO (NL)	Reciprocities of essential resource flows with environmental and spatial qualities	TUD
C2C Islands	InterReg	Area development based on C2C approach around the North Sea	TUD
G-FORS Gov. for Sustainability	FP6	Governance and knowledge forms of sustainable policy roots (SEA, AQM, ETS)	RKI
ET2050	ESPON	Territorial scenarios and visions for Europe	RKI
Investments in your future	ERDF	Treatment of sediments containing heavy metals with microorganisms	BMU
Cilento Labscape	FARO	A living lab in the national park of Cilento e Vallo di Diano	UNINA
Recycle Italy	PRIN	Re-landscaping drosscapes in Campania Region	UNINA
KnowSeas	FP7	Geodesign tool for marine spatial planning workshops;	Geo-Col
FOODMETRES	FP7	Geodesign for Food Planning and Innovation for Sustainable Metropolitan Regions	Geo-Col
PROSUITE	FP7	Prospective Sustainability Assessments of Technologies	UG
Summa	Flanders	The policy research centre for sustainable materials management	UG, OVAM
Regions for recycling	Interreg	Improving household waste recycling in Europe	OVAM
PLUREL	FP7	Peri-urban Land Use Relationships - Strategies and Sustainability Assessment Tools for Urban-Rural Linkages	IGiPZ
SURF(Sustainable Urban Fringes)	Interreg	Development of policy guidelines for the sustainable development of urban fringes	HCU
URMA	Interreg	Improving urban-rural partnerships for territorial cohesion.	HCU
RegioProjekt	FONA	Open-Source GIS-based assessment tool for projects of regional importance	GGR
Check	(BMBF, D)		
PARK 20 20	Private equity	The first full service cradle to cradle working environment in the Netherlands	DELTA

BERBION

BMBF

Die Stadt der Zukunft: Eine bedarfsangepasste Zero-Waste Bioraffinerie.(2009-2014)

SRH

As the projects in Table 3 show, the REPAiR partners are involved in the latest research, policy development and implementation of CE principles and collaborative decision-making. REPAiR partners are members of relevant international networks like the Cradle-to-Cradle Network, Climate KiC, PLUREL, the Society of Environmental Toxicology and Chemistry (SETAC) and the UNEP/SETAC Life Cycle Initiative. Beyond REPAiR partners' existing activities, REPAiR establishes links with ongoing research projects such as DESIRE and the European Resource Efficiency Platform. Through the user board members, REPAiR also connects to the peri-urban regions platform Europe (purple). The Dutch government has adopted the Amsterdam REPAiR case as a national iconic project, underlining its "Netherlands as a CE Hotspot" policy during its EU Presidency in 2016. REPAiR is thus connecting with the European and global CE field both during and after this project.

1.3.4 REPAiR's Project Structure and Methodology

REPAiR follows in its structure the six questions and models of the geodesign framework and is organised in two levels (Figure 1.3b). WPs 3 to 6 develop the six models of the geodesign framework for each study area, whereas WPs 1, 2, 7 and 8 manage different aspects across the cases and coordinate activities related to knowledge dissemination and data management.

WP 1 | Project Management

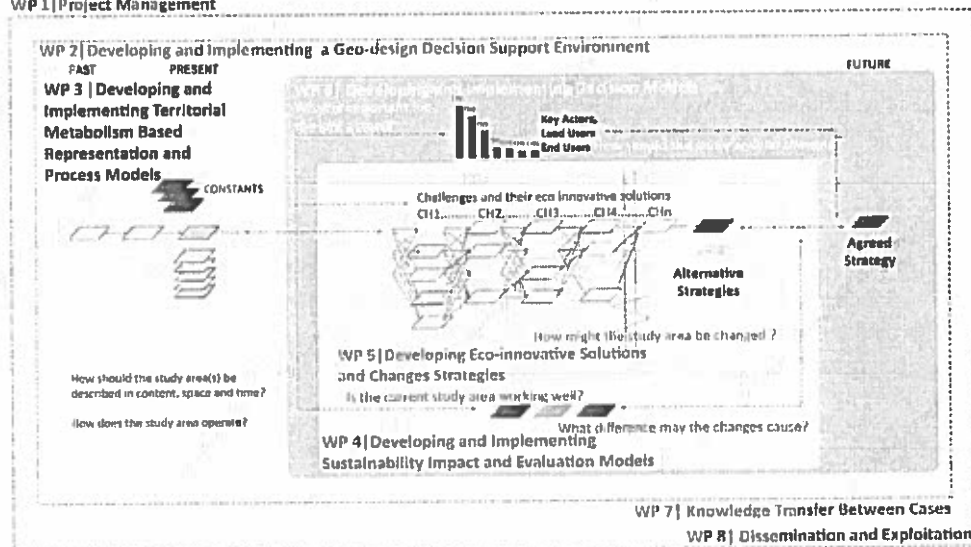


Figure 1.3b: REPAiR WP-structure. The empty parallelograms represent alternative spatial representations of proposed eco-innovative solutions. The land diagram symbolises the levels of importance for specific stakeholder groups.

REPAiR's approach to developing strategies that strengthen CE builds on the collaboration of several expert teams from industrial ecology, economy, spatial

planning, environmental policies and other relevant fields and stakeholders from particular regions. This approach calls for a methodology facilitating regular inter-team interaction in a real world environment. Accordingly, the REPAiR team needs to:

- understand the decision needs of key actors in the study areas;
- specify the concept of urban metabolism to describe the crucial processes in the study area;
- generate manifold ideas for possible changes and engage future users, local stakeholders as well as thematic experts in strategy development;
- develop a framework of indicators to assess these ideas against the current situation;
- develop a framework of knowledge transfer;
- develop data management structures and user interfaces for the GDSE to enable decision makers to assess their decision alternatives quickly.

There are four types of activities in the project, namely (a) research activities, (b) technological innovation, (c) peri-urban living labs and (d) promotion activities. These are tightly interlinked to ensure a quick market uptake of the GDSE, which will foster change and improvement in resource management, and thereby prevent waste generation and promote waste as resource.

Research activities

The four main research activities are:

- Developing and implementing territorial metabolism models - WP 3
- Developing and implementing evaluation and impact models - WP 4
- Developing and implementing decision models - WP 6

- Develop a knowledge transfer methodology- WP 5

For all thematic WPs, REPAiR uses three dimensions: (1) **flows and stocks**, (2) **place** (peri-urban landscape, environmental and spatial quality), and (3) **behaviour & governance** (organisation, lifestyle, institutions, etc). This allows for a **comprehensive analysis and assessment of quantitative and qualitative data**, because **patterns characterising the processes in the area emerge** through the interplay of these three dimensions. They will be investigated at four interrelated scales: (1) **local**, i.e. the specific peri-urban area; (2) **metropolitan** – the larger urban area; (3) **European**; and (4) **global**.

REPAiR combines, because of its interdisciplinary nature, different methods to gather, validate and triangulate data. A selection of the key methods is presented below.

Mathematical and computational modelling used for developing the evaluation and impact models:

- A variety of spatial modelling (cellular automata, agent base, land use,...)
- (Spatial) statistics
- Multi criteria assessment techniques

Quantitative research methods in order to develop and feed the representation and process models:

- environmental life cycle assessment
- reversed material flow accounting
- discrete choice modelling
- Geographic/spatial analysis
- Spatial network analyses

Qualitative research methods used to develop the decision model and transfer models:

- Analyses of secondary sources (e.g. policy documents, scientific literature, business reports)
- Interviews
- Mapping of stakeholders and space

(Urban and regional) Design methods used during the PULLS to develop alternatives for the physical urban structure, physiological processes, landscape designs and policies related to waste management through:

- collective (multi-expert) iterative design and assessments
- cooperative (stakeholder and experts) iterative design and assessments
- diagrammatic reduction to translate designs to spatial data for their assessment.

The four WPs that organise the research activities are described in more detail below.

Developing and implementing territorial metabolism based representation and process models (WP 3)

The dynamic relationships between physical, social and economic characteristics from the study cases will be gathered and analysed through the **evolution of material flows and stocks** with focus on output flows and their related environmental impacts. REPAiR's approach stands out from previous UM research as it examines **selected waste flows whilst focusing on the local level**, instead of aiming for a complete mass & energy balance of all metabolic flows relevant to the given system. For the case studies where material and waste flows are not well mapped and documented, we introduce a **reversed material flow accounting**, a bottom-up method to trace the waste output flow back to examine the inputs.

Five preliminary waste flows are selected, based on classifications defined in European Commission directives, whilst taking into account the decision needs in the study cases and the in-consortium expertise. Other waste flows will be considered depending on the specific study area in question.

- **Construction & demolition waste (CDW)**. CDW accounts for 25% - 30% of all waste generated in the EU. The level of recycling and re-use of CDW waste varies greatly (between <10% and >90%) across the EU (EC: http://ec.europa.eu/environment/waste/construction_demolition.htm).
- **Biowaste**. This waste flow can include different types of organic streams, depending on the case study area, and may differ slightly from the biodegradable waste classification deployed by the EC, which excludes e.g. forestry and agricultural residues. Two current primary areas of concern in Europe are: the production of methane from biowaste decomposing in landfills, and the growth in food waste (EC: <http://ec.europa.eu/environment/waste/compost/index.htm> & EC: <http://ec.europa.eu/environment/eussd/food.htm>).

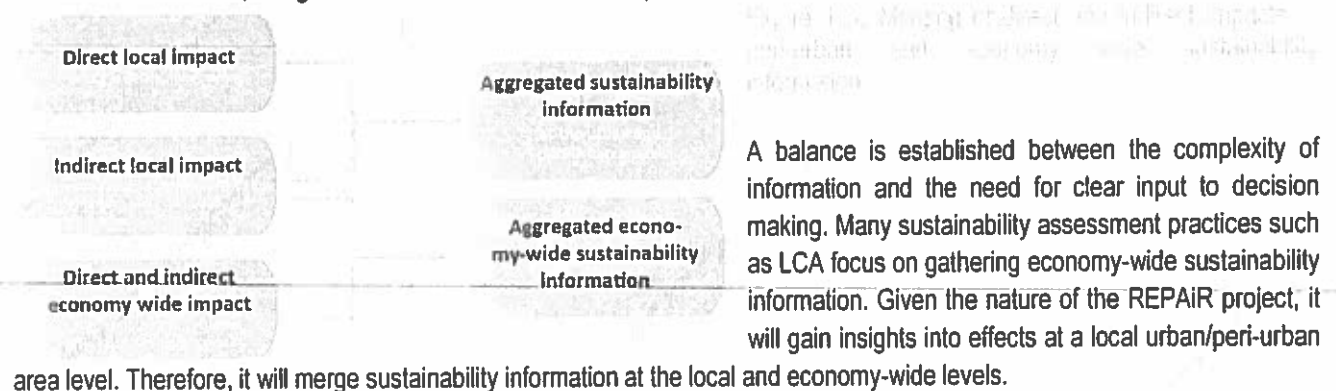
- **Post consumer plastic waste.** In Europe, only 24% of plastic waste is recycled, close to 50% is landfilled, and the rest is incinerated. Large differences exist between the waste-management measures of the EU member states (EC: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52013DC0123&from=EN>).
- **Waste electrical and electronic equipment (WEEE).** WEEE is one the fastest growing waste streams in the EU. Due to its hazardous content, WEEE may cause major environmental and health problems. Moreover, the production of modern electronics requires the use of scarce and expensive resources. (EC: http://ec.europa.eu/environment/waste/weee/index_en.htm). In 2013, from the list of fifty-four candidate materials, twenty one raw materials were assessed as critical at EU level (Oakdene Hollins/Fraunhofer, 2013).
- **Municipal solid waste (MSW).** Depending on consumption patterns, lifestyle, and waste management policies, the composition of MSW varies by country and even by municipality. Recycling performance of MSW has increased over the years in most European countries, but dumping untreated MSW in landfills is still common practice in some countries (European Environment Agency, 2013).

The main objective of WP 4 is to analyse the sustainability of the present UM in the case study areas and the influences of eco-innovative solutions in a spatially differentiated and trans-disciplinary way. This is one of the key challenges of REPAIR and has not been done before. REPAIR's starting points are the endpoints of the assessment framework developed in the PROSUITE project: natural environment, resources, human health, welfare and wellbeing. This framework will be enriched by state-of-the-art methodologies such as the Product and Organisation Environmental Footprint (PEF/OEF), waste management indicators and recycling benefits, and will be extended by widely overlooked indicators related to ecosystem services. The key challenge is to tailor the framework to evaluate peri-urban areas in a multidisciplinary (economic, ecologic, social) and spatially differentiated way. Therefore, the following questions need to be answered in order to improve the PROSUITE framework:

- Which impacts occurring at a peri-urban level are typically missed when performing traditional sustainability assessments?
- Which indicators are available and which can be of added value to the sustainability framework?
- How can these local impacts be linked to existing/new impact categories?
- Which data are available at which level?
- Which data need to be generated?

Three steps will be undertaken to develop the assessment framework:

- collecting and assessing available data on regional and local scale. Where necessary and possible, additional data will be collected or generated;
- establishing a consistent inventory (consistent with a selected system level and its boundaries; consistent with physical laws, input = output + stock increase);
- integrating the information to a relevant and limited set of indicators at an economy-wide and peri-urban area level, using multi criteria assessment techniques.



It will also assess the applicability of existing models to the case study areas and the influence of existing data on the results. A number of data collection methods will be developed and applied. REPAIR starts from the framework developed by the GDS/IF project (the natural environment resources, human health, welfare and human well-being). It then goes further to develop a socio-environmental and spatial equity assessment. DG AGRI, EMU and GEP are adjusting the framework to evaluate urban territories in a spatially differentiated and trans-disciplinary way.

Developing and implementing decision models (WP 6)

The geodesign approach is driven by the decision needs of key actors. These could range from policy needs of a governmental body to business decisions of single persons. Using actor-centred institutionalism and actor network theory as conceptual frameworks, REPAIR studies the decision needs, first through literature research and, subsequently, through interviews with key stakeholders. In parallel, secondary sources, including legislation, policy reports, contracts, and newspaper articles will be analysed in order to understand the interrelation between decision possibilities of stakeholders within their institutional settings. Based on the two previous steps, in-depth interviews with actors will be conducted to acquire information and knowledge needed to answer the following questions:

- What are the priorities of the key stakeholders?
- What are their positions and how do they differ or even clash?
- What are the objectives and requirements of the decision-makers?
- What do the decision-makers need to know in order to implement changes?
- What is the relative importance of objectives, and on what are these objectives based?

The knowledge of this decision landscape allows REPAIR to focus the activities of WP3 - 7, whilst ensuring the implementation of strategies developed as they are related to the needs of future GDSE users (WP8).

Next, WP6 develops methods to relate the change models' impacts to the key actors' priorities in order to integrate the decision models into the GDSE. REPAIR uses the PULLs to test different decision models and their applicability and feasibility with different stakeholders.

To summarise, WP6 analyses the decision making landscape of the case study areas (stakeholders, processes, legal framework) through document analyses and interviews to identify the key challenges for CE development. These form the basis of the various decision models for all cases and will be implemented and tested in cooperation with stakeholders. REPAIR draws upon the in-depth experience of HCU and RKL in the field of governance and the detailed knowledge of the case-specific actor landscapes of GHM, CRA, PHH, BIOKOM, OVAM, SRH and IVAGO.

Organising the knowledge transfer between cases (WP 7)

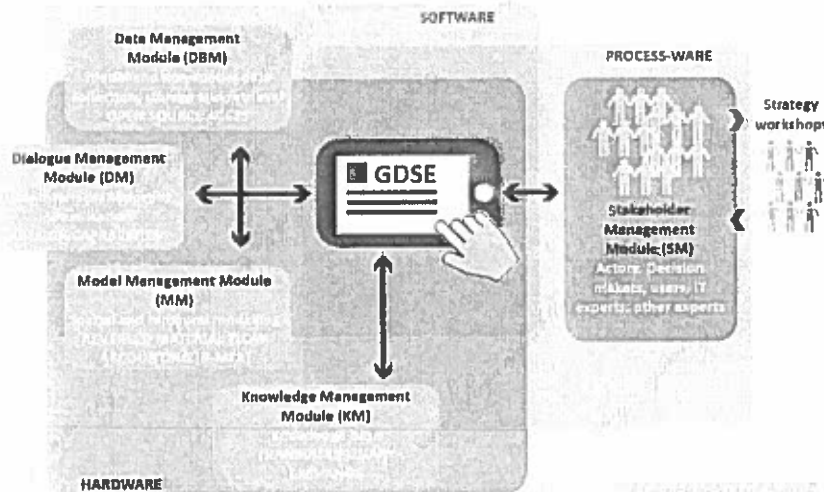
The goal of WP7 is to elaborate a knowledge transfer methodology that reveals the most effective and appropriate knowledge transfer channels, tools and processes across peri-urban areas with differentiated knowledge, technological, socio-cultural and governance characteristics. The objects of the transfer across the case study areas will be eco-innovative strategies and solutions. WP contains five steps:

- a critical review of the theoretical literature on knowledge transfer and related concepts (policy transfer, lesson-drawing, policy diffusion).
- developing a preliminary methodology for knowledge transfer
- organising knowledge transfer events bringing together the relevant stakeholders as part of the living labs to demonstrate transferable solutions as well as to gather feedback to refine the knowledge transfer methodology
- developing the final methodology for knowledge transfer
- producing an open access online handbook which will present the methodology for ensuring that the transfer of strategies and eco-innovative solutions defined in living labs to other contexts is purposeful, tailored to the local context and, thus, successful.

The handbook will (1) introduce the theoretical model of knowledge transferability; (2) describe the key lessons on knowledge transfer drawn from REPAIR; (3) discuss the potential barriers and characteristics of the knowledge transfer observed; and (4) offer guidelines for better transferability by considering local peculiarities.

1.3 Technological innovation activities - (WP 2)

Technological innovation at REPAiR is mainly in the area of software development for the GDSE. For the software development, REPAiR will follow an iterative and interactive process in which problem formulations and solutions evolve together through collaboration between the different partners, members of the user board, as well as students of the involved faculties. The process will be based on rapid development of prototypes in parallel with pilot tests (for verification & validation), to allow continuous improvement and adaptation with the evolving formulations of the problems and solutions.



The GDSE is built of five modules: data management (DBM), dialogue management (DM), model management (MM), knowledge management (KM), and stakeholder management (SM), see Figure 1.3d. Software, hardware and process-ware have to be developed, tested and implemented.

Figure 1.3d: The five modules of the GDSE

- **DBM** – This module deals with the collection, storage and retrieval of spatial and non-spatial data (WP3-6) for the different workshop sessions, and for the project overall (with WP8). The module features a database structure for storing, managing, consulting and analysing the data according to a standard model (viz. Inspire).
- **MM** – This module features spatial and temporal modelling, specifically focused on a workflow that integrates decision models, process support, change evaluation, and impact assessment. The key is to translate scientific models and their output into interactive maps that can be used during the stakeholder workshops and to model the impacts of the different eco-innovative solutions proposed.
- **KM** – This module facilitates knowledge flow and exchange between local experts, actors, and the project team experts into the GDSE, utilizing feedback generated by the models developed in WP3 and WP7.
- **DM** – This module features a user interface as well as capabilities for reporting, visualisation and design of the GDSE.
- **SM** – This module focuses on organizing a sequence of workshops in which experts, actors, stakeholders, and end users test the GDSE. Two pilot case studies with key stakeholders and the university teaching environment collaborate to test the components of the software and the process-ware stepwise.

Task 2.1.1 WP2 involves the necessary open source software components to integrate the five modules of the GDSE. WP2 also involves the implementation process of a series of strategy workshops and engages in a continuous feedback loop with the other work packages. WP2 will also involve the implementation of the GDSE in the CE context, and the integration of the GDSE with the existing CE context, and the integration of the GDSE with the existing CE context.

1.4 Peri-urban living labs

REPAiR agrees with Ferrao et al.(2013) 'that we need to begin to redesign parts of the structure that underlies the process of achieving sustainability, based on new ideas from every trace of sustainability we can locate'. Hence, design in its widest sense plays a crucial role in developing strategies for CE. REPAiR organises peri-urban living labs (PULLs), where key actors, representatives of regions, municipalities, corporations, individuals, design professionals, information technologists, scientists and students collaboratively generate new ideas and strategies for the development of CE. WP 5 organised the PULLs and is described in more detail below.

The main aim of the PULLs is to develop strategies for a more circular economy by first generating input for the development of the six models that build the GDSE as well as test the environment of the GDSE itself. The PULLs are the main place and time of transdisciplinary integration within REPAiR. REPAiR integrates activities of ongoing teaching activities at the participating universities and AMS with research conducted in the WPs by consortium partners. This is a win-win situation:

- students of urbanism, environmental ecology, building technology, geomatics and spatial planning, real estate and management and other related fields will be future users of the GDSE and are therefore the ideal test group for its development;
- student groups working on the study areas over several years help to conduct the basic research on the three thematic dimensions described above;
- the sheer number of people from different disciplines and backgrounds thinking about specific solutions in pressure cooker settings of PULLs increases the pool of eco-innovative solutions to be included in the strategies.
- for the students, participation brings the advantage of working in multidisciplinary teams on real life projects on the interface of research and design, and therefore learn skills that will be crucial for their future employability and professional success (and entrepreneurial skills).

The PULLs will be organised by a Management Board (MB) that will lead them and be responsible for concluding and reporting the results. The different workshops and other interactive and participatory events of all WPs will be integrated in time and place during the PULLs. REPAiR will conduct two different kinds of PULLs: for the pilot studies and the follow up studies. A preliminary structure is presented below.

Structure of the two pilot PULLs

Both PULLs take place simultaneously. In the Naples case study, students from UNINA do the work, in Amsterdam students from TUD and AMS. Figure 1.3e presents a preliminary structure of the pilot PULLs, which are iterations of design studios coinciding with GDSE testing, knowledge transfer and stakeholder participation workshops with phases when the results of student work and research activities of the other WPs are integrated.

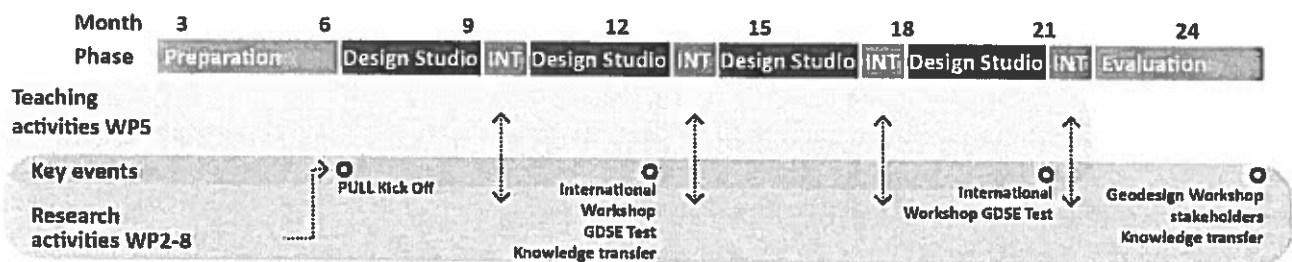


Figure 1.3f. Preliminary structure of pilot PULLs and their relation to deliverables and milestones.

To summarise, WP5 applies a living lab approach to develop specific eco-innovative solutions and strategies which will be designed, modelled (WP3), and assessed (WP4). The knowledge of the industrial partners, DELTA, BNL, BIOXIMA, Oryza, SAP, INAGD and the teaching academic institutions, UNINA, TUD, UNIFA and HCU along with their students will be integrated under the lead of UNIFA, which has extensive experience with organising living labs.

The key to successfully using the living lab approach for the development of the GDSE is the right choice of study areas; they need to be diverse enough to be representative for most European countries, but also need to be able to test and validate whether the GDSE is flexible enough to be transferable to other contexts, and to detect limits of transferability. Three of the cases are characterised by high recycling rates and low rates of landfilling: Amsterdam (NL), Ghent (BE) and Hamburg (D). The key challenge there is developing a circular economy instead of incinerating waste or exporting it. The other 3 cases, Łódź (PL), Naples (I) and Pécs (H), with lower recycling rates and higher rates of landfills, face parallel challenges of increasing recycling rates and reducing illegal dumping on the way to a CE. The wide array of characteristics within this set of cases (see Figure 1.3f) makes them representative for many other European metropolitan regions.

REPAiR uses two pilot studies in Naples and Amsterdam to develop the GDSE. The rationale behind this being that the Naples case focuses on territorial and landscape questions, whereas the Amsterdam case focuses on waste/resource flow optimisation and business development. The follow-up studies include both challenges.

Ghent Łódź ### ###						Ghent 156
Pécs 30 Hamburg 64,85 Amsterdam 82						
Naples (Acerra) 0,35 ¹						
Pécs 237 2243 Ghent 246 719 Hamburg 545 195 ² Łódź around 1 million ⁴ Amsterdam around 2 millions Naples more than 3 millions						
Ghent Łódź ### ###						
Amsterdam 10 Pécs 30,6 Hamburg 35 Naples (Naples-Caserta) 39 ³						Amsterdam 219
WASTE PER CAPITA (kg/year)						Pécs 236
Ghent Łódź ² Pécs Amsterdam Hamburg Naples (Naples-Caserta) 145 225,5 ² 355 399 438 475 ¹						
Naples ###						
Pécs Łódź Ghent Hamburg Amsterdam 10 726 16 786 31 800 37 163 37 779						
Naples (Metropolitan City) 1 171						
Łódź ⁴ 2 499						

If not specified differently, data are provided by local and regional authorities.

lack of data

1. ISPRA (2014) Urban waste Report - (High Institute for environmental protection and research)
2. Sum Hamburg case study area: District Altona, Free and Hanseatic City of Hamburg, County of Pinneberg, Schleswig-Holstein.
3. Number of inhabitants in the periurban area (156,049 inhabitants in Pécs municipality)
4. Sum of data of Łódź and Łódzki
5. sum of landfills and local dumping sites in Łódź and Łódzki
6. Active landfills less than 1km2, around 0%. Rehabilitated landfills waiting for reuse: 4km2, 1,5% of the periurban area.
7. Potentially polluted areas in the Province of Naples. Source: Arpac (2008) Sin Contaminati in Campania, POR CAMPANIA 2000-2006. Available: www.arpacampania.it [last date of access 15 april 2015].
8. Data about waste per capita in Łódzki.
9. PPS - PURCHASING POWER STANDARD PER INHABITANT Source: <http://appsso.eurostat.ec.europa.eu/hui/submitView-TableAction.do> [last date of access 15 april 2015].

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9. PPS - PURCHASING POWER STANDARD PER INHABITANT

Source: <http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do> (last date of access 15 april 2015).

Figure 1.5. Key data for the 6 case study cities.

The two pilot studies

Metropolitan Area of Naples (MAN)

Border / inhabitants: The MAN is highly dense (around 3.0 million inhabitants), with peri-urban areas near the Vesuvius volcano. The boundaries of the case-study area are delimited by considering the system of transport and ecological linkages and contain the larger plain area that reaches the Regi Lagni to the north east of the city.

Problems / key material flows: The natural and built environments are highly degraded and compromised. Criminal organisations have significant influence in this area. The Campania Region potentially has 2551 contaminated sites. These are landfills and areas of uncontrolled waste deposit. The region has six Sites of National Interest (SIN), which are polluted areas. 15.8% of the entire region is polluted, a total of 2,157 km² (ARPAC, 2008).

Aim / objectives / challenges: the main challenges related to waste management are:

1. Governance – rethink the non-existent waste cycle: landfills are saturated. More incinerators are claimed to be necessary, enhanced waste separation, etc.
2. Behaviour – the need to change people's behaviour to adopt recycling. The waste crisis in the city is an impulse that can facilitate mind-set changes.
3. Illegal dumping – serious problems regarding public health and security.
4. Recycle land – poor overview/control of illegal dumping and clean land makes creation and securing of new ecological resources essential.

The main challenges related to the spatial organization of the case-study area are:

1. High density, sprawl and lack of public spaces.
2. High amount of in-between spaces, abandoned and disused areas in central and peri-urban areas clearly connected with waste challenge 4.
3. Recover the value of former agricultural land in peri-urban areas, now used as landfills and contaminated, hence connected with waste challenge 3 and 4.

The Circular Economy (CE) Hotbed in Haarlemmermeer within the Amsterdam Metropolitan Area (AMA)

Border / inhabitants: The AMA encompasses the city of Amsterdam, the provinces North Holland and Flevoland with 36 municipalities, and a total population of over 2.4 million inhabitants. AMA Central Administration (BKG) has the administrative responsibility for the area. REPAiR focuses on developing the CE Hotbed in Haarlemmermeer, a municipality south of Amsterdam and home to Schiphol International Airport. Adjacent to the CE Hotbed, Park 20|20 develops CE in close collaboration with C2C™ founders McDonough and Braungart.

Problems / key material flows: As in Park 20|20, all buildings in the CE Hotbed are designed to have material and energy neutral footprints. Building components are designed to be fully reusable at the end of their intended use-cycle. However, whereas in Park 20|20 only the built environment itself is circular, the CE Hotbed intends to conceptualise the business models of CE within the C2C™ built environment area and to develop them into actual business. The prime movers in the global CE field (i.e. CE100 member companies, McDonough, Braungart, MacArthur, Arizona State University, etc.) are involved to achieve this result. To all parties' benefit, "local" parties and initiatives will be integrated, such as the municipalities of Haarlemmermeer and Amsterdam, Municipal Waste Processor Meerlanden, advisory/user board member AEB, the newly established Amsterdam Institute for Advanced Metropolitan Solutions (AMS), and the adjacent Enginn incubator.

Aim / objectives / challenges: the key challenges for REPAiR in relation to the CE hotbed development are twofold:

1. Develop practical business models, which requires that the irreplaceable materials used to make products, and the technologies to facilitate them, are central.
2. Spatial translation of (1).

The four follow up studies

Ghent

Border / inhabitants: Ghent is the largest city in East Flanders. The municipality comprises several small villages and towns, covers 1205 km² and has more than 240,000 inhabitants.

Problems / key material flows: Ghent has a reasonably good collection and waste processing system. However, 'higher valued' waste valorisation pathways are needed. Building waste and domestic waste (and the organic fraction) represent the key material flows in the area. Practical obstacles to initiatives include parts of the city being medieval (e.g. hard to implement new sewers, source separated collection, etc.). Additionally, lower income families are not necessarily interested in waste treatment, especially if these options raise costs.

Aim / objectives: the city aims to improve its waste management through energy-efficient renovations. Ghent also strives to decrease residual waste by another 15% and shift towards a higher VFG fraction.

Pécs

Border / inhabitants: Pécs has depressed industrial areas and a continuous decline since the 1990's, among the worst in Hungary. Pécs was a pioneer in brownfield revitalisation and recycling activities. Focusing on waste resources, Mecsek-Dráva Waste Management organization is based on a cooperation of municipalities in Pécs peri-urban area, in Baranya county and beyond.

Problems / key material flows: although regulations follow EU directives, implementation is inhibited by socio-cultural situations and centralized management structures. Local citizens, especially the older generations, do not recycle but burn or throw away household waste, plastic and bottles illegally.

Aim / objectives: The city aims to decrease household waste deposit and increase the recycling rate. New eco-innovative solutions should be developed to facilitate citizens' separating household waste. Also, a more effective recycling system should be developed to increase and promote reuse and recycling of plastic and bottles.

Łódź

Border / inhabitants: Łódź is located on the rivers Vistula and Oder. It was highly concentrated until the 1980's, when it was extended into rural areas. Large, unbuilt areas of fragmented private properties on the city fringes are a major development problem. Surrounding rural municipalities experienced a single housing construction boom characterized by lack of deliberate development planning and policy, resulting in uncontrolled urban sprawl.

Problems / key material flows: The processes of de-agrarianisation and uncontrolled urban sprawl contribute to problems linked to reuse and recycling of solid waste, water supply, wastewater and poor air quality.

Aim / objective: The city aims to define and improve the structures and decision processes of waste management in the built environment. This aim considers the main factors of waste production in sprawl areas, the "development path" of major waste producing areas, the impact of uncontrolled sprawl on municipal waste operation, land use of fallow land, legal factors, policy and ability to minimize waste.

Hamburg

Border / inhabitants: The case study area comprises the City District Hamburg-Altona and the County of Pinneberg in the federal states Hamburg and Schleswig-Holstein, is 741.75 km² large with more than 500,000 inhabitants. The area comprises a variety of urban and peri-urban settlement types (e.g. urban cores, village centres, retail, logistic etc.) and open spaces (e.g. agricultural land, natural preservation areas, etc.).

Problems / key material flows: Due to a growing economy and population, open spaces are under pressure for development into housing or commercial areas. The recycling rate is generally high, with bio-waste as the weakest performing waste cycle.

Aim / objectives / challenges: The case study focuses on improving bio-waste cycles in private households as well as in agricultural production. Ideas for improved waste cycles will be developed in cooperation with housing companies, housing cooperatives, local authorities, ecological associations, local initiatives and enterprises. The waste production and recycling behaviour of different settlement typologies will be examined.

To summarize, REPAiR uses the **transdisciplinary framework of geodesigns**, bringing together knowledge and resources from different disciplines to develop strategies for CE, based on **decision needs of key stakeholders** in six cases across Europe. REPAiR achieves this by developing new methods as well as using **GIS supported modelling and design tools** that allow decision making informed by **environmental sustainability appraisal**, including project conceptualisation, analysis, projection and forecasting, diagnosis, alternative design, impact simulation and assessment.

D) Promotion activities (WP 8)

These are crucial components of REPAiR as the project's success ultimately requires aligning complex technical solutions making it possible to develop integrated, place-based eco-innovative spatial development strategies aiming at a quantitative reduction of waste flows in the strategic interface of peri-urban areas, which will promote the use of waste as a resource. Therefore, through the dissemination and increasing the awareness of REPAiR objectives, results, knowledge and engagement of internal and external stakeholders (including end-users, other platforms, networks and connections to existing projects), the project will foster the wider acceptance and adoption of the developed GDSE tools by the key stakeholders of the circular economy chain and the REPAiR Consortium and user Board act as a hub for the deployment of focused promotion activities/materials created by REPAiR, directly reaching the right target audience in waste and resource management.

We will establish a REPAiR project website to assist in communicating the overall objectives, approach, status and outputs of REPAiR. It will be used to communicate with the scientific community, policy-makers, local and regional governments, industry, NGOs, students and the general public. The website will include project presentations, open access documents (project reports, GDSE manual, knowledge transfer handbook, papers, etc.), downloadable GDSE software packages, links to related projects, news section, etc. It will also include an embedded social media component and regularly updated project news, coupled with a calendar of the events organized as part of REPAiR. For more details on the promotion activities see section 2.2.

1.3.5 Gender Related Issues

The REPAiR consortium is aware of the European Union regulations on this issue and completely supports the principle of equality between women and men, not only to eliminate inequalities, but also to promote equality, as established in the Treaty on European Union, the Treaty of Amsterdam (May 1, 1999). Adhering to the principle of gender equality, REPAiR combines the integration of a gender perspective into all of the project policies and programmes with specific actions in favour of women. To do so, the REPAiR consortium will (1) **secure women's participation** in the research activity, as scientists, engineers, managers and technicians; and (2) **encourage and support women's mobility**. Moreover, all partners have in-house regulations preventing gender discrimination and favouring employment opportunities for women.

Research has shown **gender differences in environmental behaviour** (Denton, 2002). To increase the effectiveness of policies and programmes, gender analysis should ensure that they reach both men and women and that **gender equality is maintained in decision-making**. To fully understand gender differences and avoid stereotypes, the importance and intersection of political, economic, social, technical and legal (PESTL) factors will be applied to gender

analyses. This will entail several measures. First, literature studies will be done on change processes, drivers and ways to change waste management that include a focus on the **gender dimension of environmental processes and policies** as well as on the role of **gender as a factor affecting waste management practices** next to PESTL factors. Secondly, on that basis, practices and approaches sensitive to gender issues will be validated and promoted in the living labs. Incorporating the gender perspective into their work will not only ensure a balanced gender ratio among the partners involved, but also facilitate developing solutions for the study areas that actively promote it. Moreover, attention will be paid to the **decision-making within stakeholder groups**, and whether decisions taken are gender-biased. As a by-product of these activities, validation and comparison of gender differences and issues in the different LL will be carried out. Finally, when simulating the results and effects of different interventions, stakeholders and experts will be selected carefully to ensure gender equality.

1.4 Ambition

1.4.1 Progress beyond the State-of-the-Art

REPAiR will ensure progress beyond the state of the art by:

1. Extending the concept of UM by exploring the roles of governance settings and territorial and socio-cultural characteristics;
2. Extending the concept of UM by strengthening the relation between design, not only of products but also space, and resource management;
3. Shedding new light on participatory and science-based decision-making;
4. Combining local and economy-wide sustainability appraisal, which is partly inherent to the first three points.

Extending the concept of UM by exploring the roles of governance settings and territorial and socio-cultural characteristics

Previous research projects focusing on urban metabolism recognised the importance of coordinating and including sustainability objectives into the policies of actors operating at different scales (BRIDGE –FP7) and underscored the role of complex cross-sectoral and cross-boundary interactions needed to promote sustainable UM (SUME – FP7). Other projects focusing on sustainability and waste management in cities or peri-urban areas explored and proposed solutions for enhancing stakeholder engagement and rural-urban linkages (FOODMETRES - FP7, PLUREL - FP6) or emphasised the notion of the ‘triple helix’ – i.e. promotion of collaboration between sub-national governments, knowledge providers and industry actors to promote innovation in waste management. However, all of those projects dedicated less attention to **exploring the roles of the governance settings and territorial and socio-cultural characteristics** of different (peri-) urban areas as factors constraining or supporting the capacity to devise place-tailored solutions to promote the use of waste as a resource. This is a knowledge gap that the REPAiR project will bridge by focusing on the ways in which governance, territorial and socio-cultural characteristics shape UM and determine the transferability of solutions across different peri-urban contexts.

Extending the concept of UM by strengthening the relation between design, not only of products but also space, and resource management

Another significant gap that REPAiR addresses is the lack of integration and application of material flow analyses into spatial planning (Kennedy et al. 2011). There are two key reasons for this lack of integration:

1. the lack of knowledge exchange stemming from poor communication between researchers and planners (Chrysoulakis et al. 2013);
2. the fundamentally different units and geographic scales used in environmental analysis techniques like MFA from those that are most useful in the planning process (Roy et al., 2014).
3. REPAiR will make advancements on both aspects.
4. Through the multidisciplinary PULLs in the six case studies, REPAiR will not only bring experts from different disciplines together in order to develop space specific strategies for waste management, but it will also produce a well-documented and tested methodology of transdisciplinary strategy making;
5. REPAiR will develop a sustainability appraisal framework that will provide insights into effects at a local peri-urban area level. Therefore, it will merge sustainability information at the local and economy-wide levels.

Shedding new light on participatory and science-based decision-making

The DESIRE – FP7 project, after analysing seven European and international resource efficiency indicators sets, identified the following gaps which need to be closed for science informed political decision making to achieve more efficient resource use:

- insufficiency of indicator disaggregation by economic sectors and household consumption area,

- need for improved indicators for water use and land use and,
- lack of comprehensive biodiversity indicators as well as specific indicators
- covering key areas for a more resource efficient economy, such as circular economy indicators.

To develop indicators that fill this gap, REPAIR will start where PROSUITE ended. The impact assessment on natural environment, resources, human health, welfare and human well-being was applied in PROSUITE at the technological level or macro-economic level (worldwide input output tables). REPAIR aims at improving and applying these assessment techniques in order to use them on a more regional scale, such as the peri-urban area level.

Furthermore, life cycle thinking based assessment (LCA) at micro and macro is quite well established, in particular with respect to environmental sustainability and also recently with respect to social sustainability. But, the regional/urban/peri-urban (meso) level of REPAIR is to be advanced. 'Meso refers to a level in-between product and economy-wide. It may include groups of related products and technologies, [...] Defining and finding appropriate methods and models for this level needs further research' (Guinée et al. 2011)', which is at the core of REPAIR.

REPAIR is going to develop indicator sets that fill the aforementioned gaps by integrating UM into tools for sustainable urban and regional design. REPAIR follows Minx et al. (2011) who suggest that future research should (1) shift from environmental pressure to environmental quality; (2) include urban drivers and urban patterns; and (3) incorporate spatial quality and co-benefit notions.

Finally, while previous research recognised integration and coordination across policy silos as a challenge and/or a pre-requisite for sustainable waste management (e.g. SUME, PUREFOOD - FP7, WASTEKIT - FP7) the EU's strategic and policy documents (e.g. EC, 2011a, EC, 2014a) underscore a shortage of research proposing actual solutions to enact such joint action. REPAIR will bridge this gap by using the geodesign framework as a tool for facilitating close cooperation between stakeholders and for representing different policy areas and sectors for the design of integrated and place-specific and thus effective strategies for the use of waste as a resource, which are based on state of the art scientific methods and models.

1.4.2 Innovation Potential

Decision support tools were proposed in previous research in the fields of waste management (BRIDGE, SUME, HOLIWAST - FP6, RISCUM II - FP5, PROSUITE - FP7) and sustainable development of cities and peri-urban areas (ECOPADEV - FP5, PLUREL). Out of those, the most relevant precedents were the tools developed by the BRIDGE and SUME projects. Those in the former combined quantitative data on waste fluxes with socio-economic data to inform planning decisions, while those in the latter allowed for evaluating the effect of urban development projects on a city's metabolism, particularly its energy flows.

The integration of UM with sustainable urban and regional design tools, however, remains underdeveloped and existing tools, like the integrated resource management (IRM) model by ARUP (Page et. al. 2008), are predominantly applied to planning and designing newly developed areas. The key challenge in Europe lies, however, in the transformation of existing settlements and cultural landscapes and therefore in areas that REPAIR focuses on.

Another shortcoming that REPAIR will address is the heavily criticised static and rigid nature of the master plan approach underpinning the IRM and similar tools. Actual policies take organic planning as a starting point and need further support to avoid falling back into conventional paradigms, particularly regarding peri-urban areas, often leading to the emergence of WL and uncontrolled urbanisation with high waste production, environmental loads and thus missed opportunities for CE.

REPAIR considers spatial planning and design as promoting integrated, inclusive and participatory development and emphasises the necessity of increasing awareness of the availability of decision-making tools amongst target audiences. It will innovate by applying the geodesign framework to resource management. This in turn will allow for developing a GDSE to facilitate concrete place-specific strategies for using waste as a resource. Choosing this approach ensures the necessary flexibility and transparency in the decision-making process.

Waste management performance varies considerably between member states of the EU and, although overall waste generation is relatively stable, some waste streams are ever-increasing [EC, 2011]. Waste production - occurring chiefly in urbanized environments where roughly 75% of EU citizens live -, places significant environmental and economic strains on our society. At the same time, however, there is a significant scope for exploiting the related, so-called, second order effects like reducing the material, water and energy flows in cities [SUME project, Weisz & Steinberger, 2010] as well as an

underutilized potential for using waste as a resource [EC 2011]. In fact, each year 2.7 billion tonnes of waste is generated in the EU and on average only 40% of solid waste is re-used or recycled, the rest ending up in landfills or being incinerated [EC, 2011]. The recycling rate, however, varies from a few percent in some EU Member States up to 70% in others [EC, 2011]. Likewise, landfills have virtually disappeared in countries like the Netherlands, but in many others they represent more than 90% of waste [EC, 2014]. Landfills give off substantial amounts of methane, a dangerous greenhouse gas which is much more potent than carbon dioxide, and release environmentally harmful liquid (leachate) contaminating water and soil, hence causing serious risks for the environment and public health [EC, 2010]. That said, waste stockpiled in landfills can also be seen as a potential resource. For example, the methane produced by an average municipal landfill per year could be used as a resource and converted into electricity provided to approximately 20,000 households, while all the materials stockpiled in landfills could have an annual commercial value of around 5.25 billion euro [EC, 2010].

Addressing these challenges and tapping into these under-used resources requires generating eco-innovative and tailor-made solutions to prevent waste generation and enhance metabolic flows in urban environments,, which in turn will contribute to the EU's ambition of a **paradigm shift towards Circular Economy and a near-zero waste society, based on reciprocities between the natural and the built environment**. Considering that (1) one of the preconditions for achieving EU's long-term goal of reducing greenhouse gas emissions by 80-95% when compared to 1990 levels by 2050 is greater resource and energy efficiency [EC, 2011], (2) that the negative effects of climate change are already felt today, particularly in cities [e.g. Corfee-Morlot et al., 2009], and (3) that urban population keeps on growing (the vast majority of humanity is expected to live in in cities by 2050), there is an **urgent need to achieve this paradigm shift by investing already today in the development of game-changing eco-innovative strategies and solutions to improve resource efficiency**. The REPAiR project offers the right response to that need not only by designing such strategies and solutions in its six case study areas, but also by providing an enabling framework for achieving this in virtually any urban area in Europe and beyond.

Specifically, REPAiR will realize this by analysing resource flows within cities and designing the Geodesign Decision Support Environment (GDSE), a toolkit for devising place-specific strategies solutions to enhance waste management significantly and promote the development of a circular economy, while contributing to the improvement of spatial quality and the quality of life in urban regions, peri-urban areas in particular. The GDSE will be an open source tool and can be used by regional and local authorities and other stakeholders (see section 2.1.1) for informed and participatory decision-making to develop strategies towards sustainable development of urban regions in an integrated and trans-disciplinary manner. By integrating economic, social and environmental dynamics, and being sensitive to gender equality and social inclusion, this instrument will allow for overcoming the compartmentalised waste management and spatial strategy making approach that so far remains predominant in Europe and hinders the capacity of the regional and local authorities to reduce waste generation, improve the local resources-based urban metabolism and enact a transition towards a circular economy.

REPAiR will deepen the understanding of urban metabolism and share this knowledge with a variety of interested stakeholders within the European circular economy community, while educating the future generations of decision-makers and practitioners dealing with waste and resource management. Moreover, REPAiR aims to raise awareness of the need to boost resource efficiency within the wider society and to provide tools that help in bridging the significant gaps in innovation in waste management and in recycling rates between the EU Member States [EC, 2011].

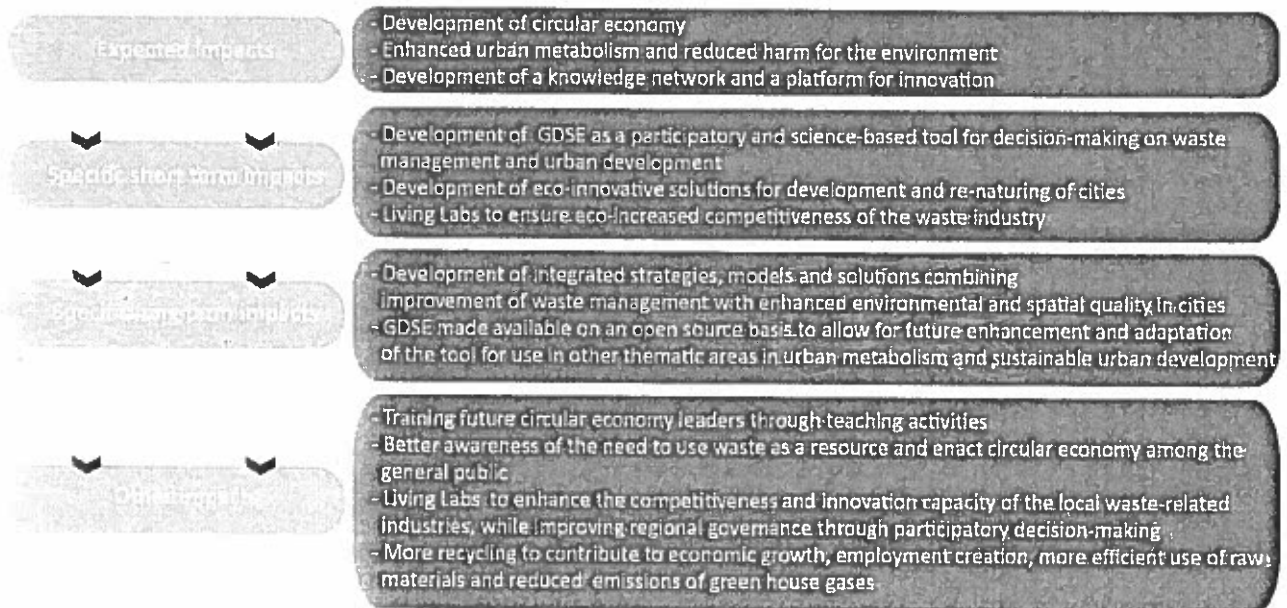
REPAiR's outcomes will therefore offer a distinctive contribution to the EU's medium- and long-term aims in terms of greater resource efficiency, as outlined in the key strategic documents EC, 2011a, 2014a, 2014b) and supported by the recent proposals for amendments to the EU's waste-related legislation [EC, 2014c]. The key ambition underpinning those initiatives is to support re-using, repairing, refurbishing and recycling existing materials and products in order to enact, by 2050, a transition towards a Circular Economy in Europe 'where nothing is wasted and where natural resources are managed sustainably, and biodiversity is protected, valued and restored in ways that enhance our society's resilience. Our low-carbon growth has long been decoupled from resource use, setting the pace for a safe and sustainable global society' [EC, 2014a]. The anticipated benefits of these initiatives also include *inter alia* reduction of greenhouse gas emissions, new growth and job opportunities, improved health and well-being and spatially better organized cities. REPAiR will seek to generate those beneficial impacts by addressing the nine priority objectives of the EU's 7th Environment Action Programme (EAP) to 2020 [EC, 2014a], as listed in Table 2.1 Below.

Priority Objectives of the 7 th EAP	REPAiR's contribution
1. 'To protect, conserve and enhance the Union's natural capital'	REPAiR will contribute to safeguarding natural capital by (1) ensuring a sound and measurable application of the waste hierarchy i.e. reducing waste generation, maximizing reuse and recycling, limiting waste-to-energy strategies primarily to non-recyclables, phasing out landfilling, and (2) protecting and improving spatial environmental quality .
2. 'To turn the Union into a resource-efficient, green, and competitive low-carbon economy'	REPAiR promotes waste as a resource to improve the efficiency and effectiveness of waste and resource management , while creating new opportunities for growth, job creation and innovation in business and industry, and achieving relevant and accountable carbon emissions reductions . It is estimated that the use of recycled materials compared to virgin materials can reduce energy consumption by up to 50% (e.g. for metals) and thus contribute to EU climate and energy targets as much as resource efficiency and circular economy targets.
3. 'To safeguard the Union's citizens from environment-related pressures and risks to health and wellbeing'	The toolkit developed by REPAiR (GDSE) will be used to devise eco-innovative solutions combining better waste management with reduction of harm to the environment and improvement of spatial quality , which in turn will enhance health, wellbeing and quality of life for its citizens.
4. 'To maximize the benefits of the Union's environment legislation by improving implementation'	By providing a toolkit for informed decision-making (and feedback loops) towards devising eco-innovative solutions for better waste management and the use of waste as a resource , REPAiR will directly contribute to better implementation of the EU's legislation on that matter within the case study areas and beyond.
5. 'To increase knowledge about the environment and widen the evidence base for policy'	REPAiR will provide GDSE on an open source basis and make all of the findings and data available on an open access basis for the purpose of further research, policy-making and education . It will also diffuse the knowledge generated across the case study areas and among the relevant group of stakeholders (public institutions, academia and entrepreneurial) and the general public through a range of dissemination, exploitation, knowledge transfer and communication measures.
6. 'To secure investment for environment and climate policy and account for the environmental costs of any societal activities'	The living labs set up in the case study areas will facilitate close collaboration between the knowledge providers, stakeholders and the relevant small and medium enterprises, which is expected to lead to innovation and, potentially, stimulate investment in the development of new branches of waste management industry . The living labs will also generate knowledge on the negative environmental impacts of waste , while proposing eco-innovative solutions to reduce them .
7. 'To better integrate environmental concerns into other policy areas and ensure coherence when creating new policy'	REPAiR's approach is transdisciplinary and the application of GDSE will entail working across policy silos (waste management, spatial planning, urban design, environmental protection, economic and fiscal policy), to promote integrated policy solutions for the use of waste as a resource and enhance metabolism of urban regions as a whole, and spatial consequences in peri-urban areas in particular.

8. 'To make the Union's cities more sustainable'	Recognising the under-used potential of cities to reduce waste generation and promote a circular economy, as highlighted in the SUME project (Weisz & Steinberger, 2010), REPAiR will provide a toolkit (GDSE) specifically designed to improve waste management in cities, with a special focus on the role and improved potentials of peri-urban areas (as an interface between urban areas and hinterland, between professional stakeholders and citizens) towards more sustainable and reciprocal synergies.
9. 'To help the Union address international environmental and climate challenges more effectively'	REPAiR's dissemination and exploitation strategies, ensuring broad outreach both within the EU and beyond, are in line with the EU's global ambitions on environmental and climate change leadership. Moreover, the interaction between the diverse peri-urban contexts within REPAiR's case studies will diffuse knowledge helpful in bridging the gaps in innovation and recycling rates between them, while potentially accelerating efforts to address cross-border environmental and climate challenges. In fact, improving waste management also reduces greenhouse gas emissions. It is estimated that better waste management across all waste streams could lead to reduction in CO ₂ emissions by 146 to 244 megatonnes, i.e.19-31% of the European climate reduction targets by 2020 (EC, 2010c).

2.1 Expected impacts listed in the work programme

The REPAiR project will provide a toolkit for turning the European Union's environmental ambitions concerning waste management and sustainable cities into reality. In fact, the GDSE will allow for translating the EU's aims into integrated and place-tailored strategies and eco-innovative solutions for using waste as a resource in cities and in particular their peri-urban areas. REPAiR recognises the essential role of cities and their peri-urban hinterlands for ushering



in a circular economy, and will identify and exploit opportunities for combining the use of waste as a resource to achieve enhanced spatial quality, living conditions (health, well-being) and sustainable urban development. REPAiR is expected to offer a significant contribution to the impacts envisaged for the call WASTE-6b-2015 (issue b) Eco-innovative strategies), as summarised in Table 2.1b and described in more detail below it.

Expected Impacts	What REPAiR will deliver	How
Measurable improvements in waste management.	Identifying, matching and harvesting potentials for a circular economy for roughly 7,000,000 EU citizens living in the six case study areas, while providing a toolkit to achieve similar paradigm shifts in other EU urban regions.	Via the GDSE and knowledge transfer activities (WP7), and on the basis of inputs from the research conducted in case study regions as part of WP3, WP4, WP5. Dissemination and exploitation activities will ensure outreach beyond the case study areas (WP8).
Operationalization of urban metabolism to support sustainable urban development and reduce negative environmental impacts.	Integration of a dynamic model of resource flow performance assessment with parametric support for related spatial quality, regional planning and design in an open source, effective and manageable geodesign environment.	Via the GDSE, concrete eco-innovative solutions and models tailored to the specificities of the case study regions will be elaborated in such ways that, together with the delivery of the toolkit itself, form relevant references for different urban regional contexts and metabolisms in the EU and abroad.
Promoting research and innovation leadership.	REPAiR will establish knowledge and spur further research, while providing an environment for breeding innovative and place-based solutions for using waste as a resource.	The knowledge network will outlive the project and offer a breeding ground for further research and innovation. The GDSE will provide a platform for innovation, while the exploitation and dissemination strategies supported by the involved joint TU Delft, MIT Boston and Wageningen UR initiative, AMS institute, will ensure that the data produced by REPAiR are used in future research and education worldwide.
Specific impacts (short term)	What REPAiR will deliver	How
Establishing a participatory and science-based tool for decision-making and planning of urban development and waste management.	The GDSE will be a geodesign-based participatory tool for informed decision-making with participatory feedback loops, based on the inputs from a range of circular economy stakeholders.	The toolkit will be developed and then used in an iterative process in close collaboration with the local stakeholders in two different problem typologies, each subsequently iterated in two other relevant urban regional/institutional contexts, while involving a well-balanced user board, providing essential inputs on each of the six cases and the European context.
Collectively built solutions for urban development and re-naturing of cities, measurable by indicators.	Using enhanced urban metabolism, to promote sustainable urban development drawing upon near-field synergies between the built and the natural environment, in particularly focussing on peri-urban areas where cities and hinterland, waste and	By developing eco-innovative, collectively built and gender-sensitive solutions to place-specific waste management challenges within crucial peri-urban areas in six urban regions. The GDSE will provide an open-source decision model and platform allowing for quantification

	resource, nature and culture meet.	and validation of alternative solution paths, while providing feedback loops for essential stakeholders.
Eco-Increased competitiveness of soil-ecology-construction-waste treatment related industries.	A platform for breeding innovation in close collaboration between industry, researchers and other stakeholders. This will benefit the local waste-related industry in case study areas by decreasing laboratory-to-implementation time, providing shorter development paths towards implementation of effective waste management solutions.	Industry partners will use the living labs to present, test and assess newly developed technologies in a 'real world' environment. The solutions and knowledge generated in living labs and through the GDSE and knowledge dissemination (via the platform and included partners like the AMS Institute) will be transferred to other case study areas around Europe and abroad.
Specific impacts (long term)	REPAiR Contribution	How
Enhanced environmental resilience and quality of life.	Development of an integrated approach interweaving solutions to environmental challenges with interventions that can be used not only to enhance environmental and spatial quality, but also address a range of other sustainable development challenges.	Eco-innovative solutions developed will improve the capacity of urban environments to deal with future resource management challenges, while triggering transformations in spatial qualities, sustainability and urban metabolism. These shifts will together enhance quality of life.

General impacts

First, REPAiR will produce measurable improvements in waste management. Without additional waste prevention policies in the EU, waste generation is expected to increase by 7% between 2008 and 2020, which calls for maximizing the opportunities for improved waste management (EC, 2011). REPAiR offers a concrete response to this call and contributes to the European Commission's ambitions (EC, 2014b) to boost reuse and recycling of municipal waste to a minimum of 70% by 2030; increase the recycling rate for packaging waste to 80% by 2030, and ensure that EU Member States virtually eliminate landfill by 2030. This will be achieved through the application of the GDSE for strategically identifying, matching and harvesting potentials for a circular economy in six concrete locations representative of peri-urban areas across Europe. More specifically, this will entail:

- quantification and tracking of essential resource flows (WP3);
- mapping and quantification of environmental, spatial, institutional and economic effects of present and future resource flows (WP4);
- determination of a set of indicators to inform decision makers (WP4);
- optimisation of (re-)use of resources, (environmental, economic and spatial) by qualitative matching of local eco-innovative solutions with potentials and inclusion of feedback loops to stakeholders of the specific resource characteristics (WP 5).

Second, REPAiR will entail operationalization of urban metabolism to support sustainable urban development and reduce negative environmental impacts. REPAiR will integrate a dynamic model of resource flow performance assessment with parametric support for spatial quality, regional planning and design in an effectively implementable and administrable geodesign decision-support environment. This will allow not only for reducing harmful environment impacts on metropolitan areas, but also for generating positive effects in terms of spatial quality and justice, sustainability, resilience and prosperity.

Third, REPAiR will promote research and innovation leadership in a number of ways throughout the project and after its completion. REPAiR will thus establish an innovative WM/CE knowledge network comprising academic, policy and

industry partners both within the study areas (where the consortium members already collaborate with a wide range of organisations in academia, industry and public authorities) and across Europe. This network will serve as a breeding ground for further research and innovation in the areas of waste management, circular economy and sustainable urban development. This will be supported by the cooperation of the consortium with AMS Institute (Institute for Advanced Metropolitan Solutions), a joint initiative of Massachusetts Institute of Technology, TUD and Wageningen University. Moreover, the application of the GDSE in the case study regions and its promotion in other European peri-urban areas will support generating eco-innovative solutions addressing the need to reuse waste as a resource and hence improve the innovation capacity of those urban regions. Promoted and supported by the consortium members, and the AMS institute, the teaching activities as part of REPAiR will allow for engaging the waste management and urban professionals and the future leaders of the circular economy in the research and equip them with knowledge and skills to carry out further scientific work on this topic.

Specific short-term impacts

REPAiR is expected to generate three kinds of short-term impacts. First and foremost, it will establish a participatory and science-based tool for informed decision-making and planning in urban development and waste management. Stakeholder participation and the inclusion of a user board play a crucial role in the iterative development and validation of the GDSE for the two key WM problem typologies. The GDSE will be developed and implemented in six study areas. Subsequently, being a fully customisable toolkit, the GDSE will be promoted more widely and made available on an open source platform to be used by sub-national authorities and stakeholders in peri-urban areas across Europe and beyond. The customisability and flexibility of GDSE (see long term impacts below) are the core advantages of this toolkit, which, supported by well-defined and high-impact dissemination and assistance by the AMS institute, are expected to ensure its wide uptake, facilitated by the project's exploitation strategy.

Second, REPAiR will benefit the case study areas by producing collectively-built and gender-sensitive solutions for urban development and re-naturing of cities, and peri-urban areas in particular, measurable by indicators and sensitive to the issue of social inclusion. REPAiR entails designing a variety of solutions to place-based challenges for the development of a circular economy and of assessment models allowing for quantification and validation of alternative solution paths. Therefore, REPAiR uses an enhanced urban metabolism approach to promote sustainable urban development built upon near-field reciprocities and synergies between the built and the natural environments.

Third, REPAiR will contribute to the increased competitiveness of soil-ecology construction-waste treatment related industries in the case study regions. This will be achieved through the set-up of six PULLs in each of those regions that will enable the relevant industries to present, test and assess newly developed technologies in a 'real world' environment. This will decrease laboratory-to-implementation time, providing shorter development paths towards more applicable and effective solutions, subsequently transferable to other areas. The eco-innovative waste management solutions and strategies generated in PULLs will be selectively and strategically transferred to other case study areas, according to knowledge transfer methodology (WP7).

In the long-term, REPAiR is also expected to enhance environmental resilience and quality of life both in the case study areas and in other regions across Europe. The GDSE addresses the increasing double complexity of urban environments, particularly in peri-urban areas. By integrating principles from landscape ecology, environmental sciences and industrial ecology, complexity science and urbanism, it provides a strong resource management and spatial development framework towards resilient metropolitan areas. The application of eco-innovative solutions developed, tested and assessed in REPAiR will improve the capacity of urban environments to deal with future resource management challenges, by promoting an understanding of metropolitan areas as combined urban-natural systems based upon reciprocities in a circular economy and dynamic equilibrium. These solutions involve breakthrough transformations that radically influence spatial qualities, sustainability, comfort, liveability and the essential (sometimes called crucial) flows of the urban metabolism, which in turn will ensure better quality of life. Beyond that, the participatory, science based decision making tool GDSE, can be used in other thematic areas within the urban metabolism to achieve and secure lasting (resilient) sustainable urban development (e.g. air quality management, renewable energy production).

Other important impacts

The project is also expected to generate **other positive impacts** beyond those outlined in the call, namely in terms of (1) education, skills development and awareness building; (2) institutional capacity and governance; as well as (3) economic growth, employment, competitiveness and reduced carbon footprint of European industry.

Education, skills development and awareness

REPAiR entails **integration of its outcomes into teaching activities** of four leading European universities, and the AMS institute, meaning that within the lifetime of the project more than one hundred industrial ecology, spatial planning, architecture and urbanism students and, via the planned AMS MOOCs, tens of thousands of urban professionals (and/or interested students world wide), will be educated to promote and implement the shift to a stronger circular economy (one of the three main themes of AMS) and will become its advocates. This ensures that the impact of REPAiR will outlive the project's duration. Moreover, by providing teaching tools and materials on an open access basis, teaching on circular economy will be offered freely to other higher education institutions, educating and sensitising a far larger group of students across Europe.

Better governance through participation

By encouraging the relevant circular economy stakeholders to work together within the GDSE, REPAiR will not only allow for exchange of (often tacit) knowledge between them, but also will contribute to better governance and administrative capacity in European regions, a pre-condition for effective implementation of EU's waste or regional and urban policies (see EC, 2014e). REPAiR's participatory approach will thus strengthen two of the 'pillars' of the regional quality of government (Charron et al, 2014): (1) voice and accountability; and (2) the effectiveness of the regional and local authorities.

Positive impacts on the local economies, competitiveness and carbon footprint of the European industry

REPAiR is expected to generate **positive effects for the local economies**. Thus, through the application of GDSE and the collaboration between relevant industry, knowledge and societal partners within the living labs, and knowledge transfer across the cases, REPAiR will **stimulate innovation potential, competitiveness and growth, particularly of the local SMEs dealing with waste management**. GDSE will facilitate innovations that will meet existing or new demands in the local, European and possibly global markets. By achieving this, REPAiR will add the European Commission's call for **stepped up efforts to remove barriers to eco innovation, and to unlock the full potential of Europe's eco-industries** (EC, 2014). Furthermore, improved waste management through REPAiR is expected to generate **benefits for green jobs and growth** (see EC, 2014). It is estimated that reaching a recycling rate of 70% at the European level would generate roughly half a million jobs (EC, 2010c), while resource efficiency improvements all along the value chains could represent an overall yearly savings potential of 630 billion euros for European industry (EC, 2014). Other studies indicate that circular economy approaches could offer potential to boost EU GDP by up to 3.9% by creating new markets, products and value for business (EMF, 2012). Moreover, previous research (Dubois & Christis, 2014) has shown that more recycling **generates new economic activities and creates new jobs**: for example, in Flanders, 27,000 extra jobs would be created and 2.3 billion euros worth of added value would be generated if the region moved to a genuine circular economy. Employment created would then concern not only the field of recycling, but also entail creation of new repair, refurbishment and remanufacturing jobs. Additionally, by **enhancing the quality of life and liveability** in the case study regions, the project would indirectly help to **attract talents and skilled employees**.

In addition, by including a focus on promoting the recycling of waste of electrical and electronic equipment (WEEE), REPAiR's results will also contribute to the specific goals on recycling of raw materials by European industry. Research (Huisman et al. 2015) has shown that EU countries in 2012 only managed to properly recycle 35% (3,3 million tonnes) of all electronic waste. The EU goals to remedy this situation are outlined in DG GROW's action on Critical Raw Materials (EC, 2011f) and the Raw Materials Initiative (EC, 2014e). One of the three pillars of this initiative is resource efficiency and supply of 'secondary raw materials' through recycling. Thus, the recycling of WEEE, to be promoted by REPAiR, will contribute to the Commission's efforts to cope with critical raw materials supply problems.

Last but not least, REPAiR's positive economic impacts from improved waste management will also generate beneficial second order effects in terms of **reduction of green house gases emissions**, in line with the EU's climate

objectives for 2020. In fact, boosting the circular economy through measures such as recycling and reuse of materials is estimated to not only bring net savings of 600 billion euros, equivalent of 8% of annual turnover of EU businesses, but also reduce greenhouse gas emissions by 2-4% per year (EC, 2014e).

2.1.1 Scenario for further uptake and identification of stakeholders

The outcomes of REPAiR will be of relevance and use to a wide variety of stakeholder groups (see Figure 2.2 below). The strategy to ensure stakeholder uptake of the projects results and developed tools is based on three elements:

1. Careful and strategic mapping of REPAiR's stakeholders' landscape to identify groups of end users of the project's outputs;
2. Outreach measures tailored to the different target groups to encourage them to use REPAiR's outputs in their own activities and distribute these in their networks;
3. A comprehensive representation of those groups within the consortium and outreach to their peers.

Four groups of stakeholders were identified as the **Lead Users of the GDSE** and the related tools: (1) regional and local

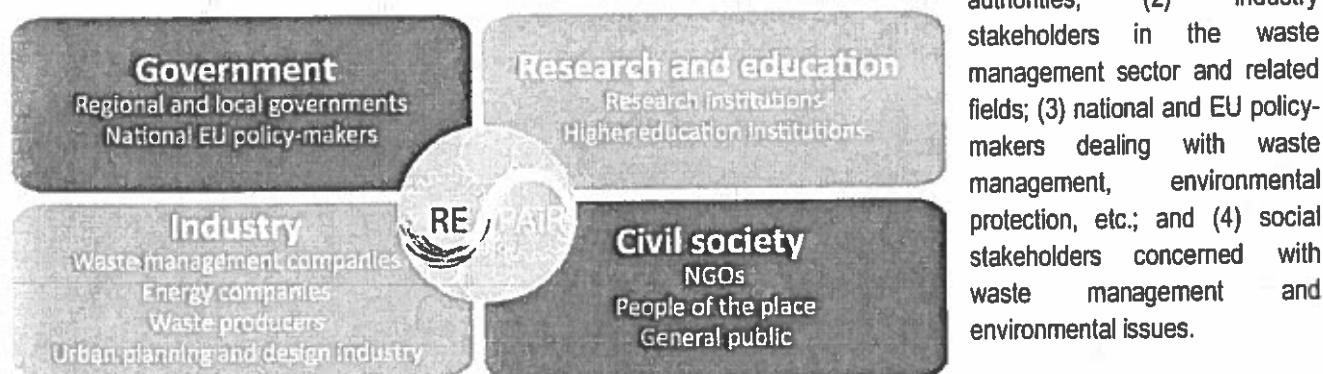


Figure 2.1b REPAiR's main stakeholder groups

The first group, **regional and local authorities** interested in enhancing waste management within their territories, yet struggling with the complexity of this public task, and involvement of private partners, are expected to take the GDSE. The latter will offer a useful, comprehensive and fully customizable decision-support toolkit based on an integrated and collaborative approach to urban metabolism and relevant feedback loops. More specifically, the GDSE will be of particular interest for the regional and local officials in charge of spatial planning, environmental policy, waste management and energy policy. Their direct involvement in the development of the GDSE and, subsequently, in its application within the six case study areas to address the place-specific challenges formulated by themselves, in collaboration with the other stakeholders involved in REPAiR, will ensure that the toolkit matches their needs and create a sense of ownership of it, which in turn will increase the likelihood of further uptake of The GDSE in their practice beyond REPAiR. The co-development of the GDSE by these officials will also secure that the tool will be relevant, accessible and attractive for users within regional and local public authorities in other urban regions across Europe.

Secondly, the GDSE will also be of interest to relevant industries like:

- waste management industry working for the regional and local governments;
- 2nd order relations, like companies dealing with energy provision (opportunities for innovation in production of energy from waste) and waste-based manufacturing (here: CE industries);
- urban planning and design, as REPAiR puts an emphasis on the role of spatial planning in urban metabolism and the improvement of spatial quality (both qualitatively and in organisational effectiveness) as a by-product of improved waste management.

The GDSE, being an open source platform, will offer the relevant businesses a possibility to adapt it to different uses and/or enhance it to improve its usability in different contexts. The GDSE will thus offer businesses in waste-related industries an attractive and adjustable tool for improving their own practices (reducing waste generation, enhancing waste treatment, promoting recycling of materials, re-using of waste to produce energy, etc.) as well as a basis for developing a new decision-support software tailor-made to their activities and markets. Thus, software developers (first users) within the open source community and/or working for the businesses (e.g. specialized consultancies) wishing to further adapt the GDSE or develop new proprietary software on its basis, will be able to take advantage of the open source platform through which the toolkit will be

made available. This potential for further adaptation and development of the GDSE by businesses is expected to **expand REPAIR's long term impacts on waste management practices in Europe.**

Thirdly, the knowledge and the tools produced by REPAIR will inform the regional and urban, environmental, energy and economic policies of the **European Commission and the national governments** having the improvement of waste management and development of Circular Economy on their policy agendas. The officials from DGs for Regional and Urban Policy (DG REGIO), Environment (DG ENV), Energy (DG ENER), and Internal Market, Industry, Entrepreneurship and SMEs (DG GROW) as well as the national ministries dealing with spatial planning, urban policy, environmental protection, economic development and energy policy, will be interested both in promoting this GDSE as an integrated tool for enhancing waste management, competitiveness of the waste-related industry. and They are thus an important additional group of stakeholders targeted by REPAIR and expected to have a strong interest in taking up the project's results.

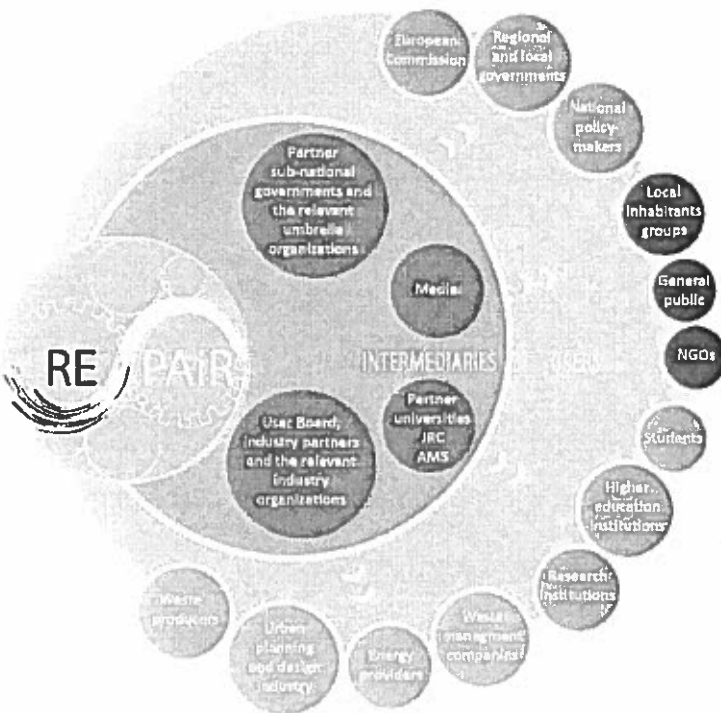


Figure 2.1c REPAIR's stakeholders landscape.

Fourthly, REPAIR's results will be of interest for the **social stakeholders**, including a range of groups within the civil society, such as non-governmental organisations (NGOs) dealing with environmental issues, groups and associations of local inhabitants concerned with the local environment, the local economy or the spatial quality.

Beyond those four kinds of Lead Users, the project's **scientific results** - diffused through academic papers, reports, conference presentations and other means – **will be taken up by the interdisciplinary research and education community** working on urban metabolism and waste management spanning a range of disciplines, from urban and regional studies, spatial planning to geography and environmental sciences. The researchers will also take advantage of the data produced by REPAIR, which will be made available on an open access basis for the purpose of further research drawing on REPAIR's findings.

Moreover, the project's results will also be used to design open access teaching materials - a valuable educational aid for **higher education institutions** offering education grounded in cutting-edge research on circular economy and urban metabolism. These materials will also serve as a basis for the development an AMS massive online open course (MOOC) on the topic of circular economy of interest to students and practitioners.

Last but not least, REPAIR's findings will also be of interest for the **general public**, which is increasingly aware of the environmental challenges in cities and receptive to the practices associated with circular economy, such as recycling and reusing waste as a resource to produce energy or new products.

It is important to stress that REPAIR will reach out to the above mentioned groups of end users of REPAIR's results directly (e.g. through the website, events, conference presentations, reports, publications) and through intermediaries, from among the consortium members and the user board, who will contribute to the expected impacts. The consortium includes partners representing the European Commission's own research institution (JRC), academic research and higher education institutions (e.g. TUD, UNINA), the joint TUD/MIT/WUR AMS institute, local and regional governments (e.g. GHM, CRA, OVAM), and industry (e.g. BLOKOM, DELTA). Like the lead users within regional and local authorities, the industry partners in the consortium and the user board will be particularly interested in taking up REPAIR's outputs because they will play a key role in the development of the GDSE, used to respond to the waste management and spatial problems that they will have formulated.

At the same time, all of the abovementioned organisations will play a key role as REPAIR's ambassadors and intermediaries in the outreach activities within their jurisdictions and peer groups during the project's implementation

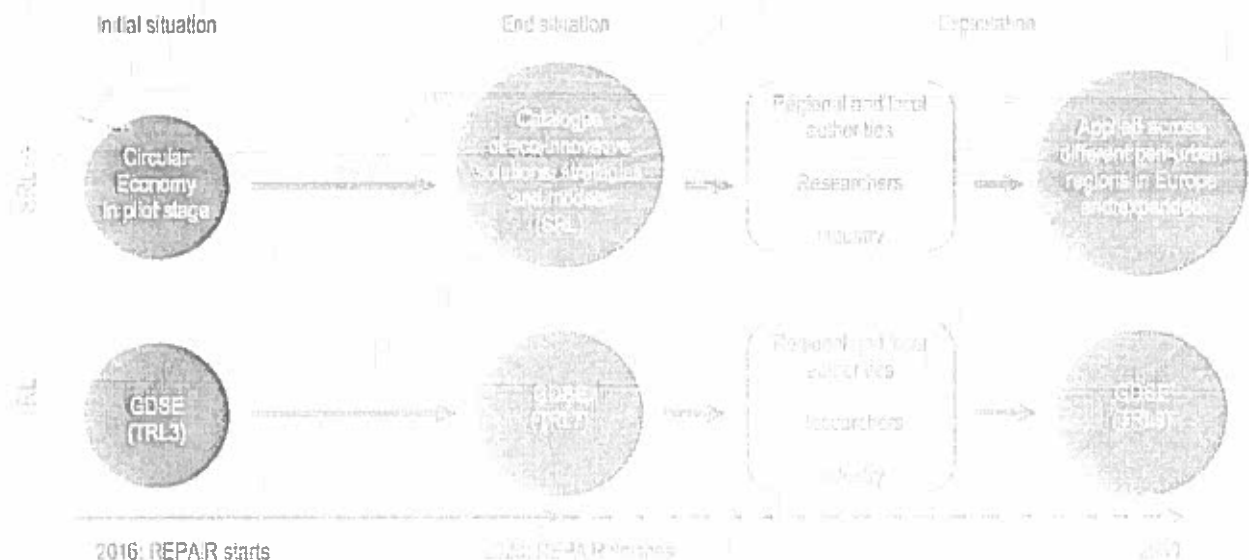
and after its completion. This will ensure that REPAiR's outputs are further developed to increase their TRL level (for the GDSE) and SRL (for other outputs). The organisations have extensive networks of partners and contacts with organisations in the value chain in waste management in the case study areas. Those networks are at the very heart of REPAiR's strategy to ensure adoption of the project's outputs and will be mobilised throughout the project's duration and continue operating after its completion. Moreover, the members of the user board will play a similar role as intermediaries in contact with relevant stakeholders.

Finally, the consortium will approach and use relevant external intermediaries capable of reaching out to a significant number of actors within a particular stakeholder group. These include:

- thematic international networks and associations focused on:
- waste management, circular economy and related topics (e.g. European Recycling Industries' Confederation (International Solid Waste Association, European Recycling Industries' Confederation, European Compost Network, UNEP/SETAC Life Cycle Initiative, Association of Cities & Regions for Recycling and for sustainable Resource management, WEEE Forum, , BDE Federation of the German Waste, Water and Raw Materials Management Industry Business and Employers Confederation),
- sustainable urban development (e.g. Covenant of Mayors, AMS/Smart Cities, PLUREL, The German Institute of Urban Affairs – Difu)) and spatial planning (European Council of Spatial Planners - ECTP-CEU);
- environmental and climate change issues (e.g. European Network of Environmental Professionals, Society of Environmental Toxicology and Chemistry, Climate KiC);
- European and national representative bodies, networking and lobby groups for regions and cities (e.g. METREX - The Network of European Metropolitan Regions and Areas, EUROCITIES, European Urban Knowledge Network, The Association of Flemish Cities and Municipalities - VVSG, The Association of Dutch Municipalities – VNG, The Association of German Cities);
- European and national non-governmental organisations and their federations (e.g. European Environmental Citizens Organisation for Standardisation, German League for Nature, Animal and Environment Protection – DNR);
- governmental organisations operating at different scales (European Commission, The Committee of the Regions, European Economic and Social Committee, national ministries, the Dutch Presidency of the EU in 2016, regional and local environmental, planning or waste management agencies).

These intermediaries, both internal and external, will play a crucial role in:

1. Promoting the further development of the GDSE beyond TRL7, thus overcoming the so-called 'Valley of Death' or the critical stage at which the development of new technologies tends to get stuck;
2. Further development of the other outputs of the project towards higher SRL by the regional and local authorities, research institutions and industry actors (see Fig. 2.1d below).



2.1.2 Innovation Capacity and New Knowledge

REPAIR's integrated approach to waste management, based on a joint geodesign and urban metabolism approach, and its core product, the GDSE, are expected to be game-changers in waste management practice and attract significant interest of the companies in this sector. The project's outcomes will lead to support of decisions towards more efficient waste management in cities and promote the use of waste as a resource. This will be achieved through eco- solutions and change strategies devised in close cooperation between the researchers, industry partners, the territorial governments and other stakeholders within the PULL set up in the six case areas and transferred across those regions using a knowledge transfer methodology to ensure adaptation to the differentiated local contexts. REPAIR will thus provide the local SMEs in the relevant branches of the economy (waste management, energy provision, urban planning and design) with a test bench and diffusion platform for innovation emerging from cross-sectoral collaborations in the case study areas. This is expected to contribute to a paradigm shift in waste management towards one based on recycling and reusing waste, while ensuring positive spin off effects in spatial quality, quality of life and other educational, economic and environmental benefits. It is also expected that the use of the GDSE and the innovation activity as part of REPAIR's PULL could lead to spin-off applications and adaptation of the GDSE to be used not only in the waste management industry but also in other fields (e.g. air quality management, energy transition). Potential barriers, obstacles and framework conditions

Sound project management requires anticipation of potential external barriers to the delivery of the planned project outcomes. The expected possible obstacles to success and the remedies envisaged to mitigate them are listed in Table 2.1. below.

Table 2.1c. Potential external barriers to the project's success and the means to overcome them.

Barrier	Probability	Impact	Remedy available
Institutional and legal barriers. Differences in national administrative systems and regulatory regimes concerning waste management across and within the EU member states. These differences may potentially entail obstacles to the transfer of eco-innovative solutions and change models across case study regions.	Low	Low	It is the intention of the consortium to investigate such issues. WP 7 will produce a methodology for knowledge transfer that focuses on enhancing the transferability of solutions by scrutinising the differences between the governance context from which the solution originates and the one to which it is to be transferred and selecting the most transferable solutions and adapting them to ensure that it produces the expected impacts.
Knowledge barriers. Knowledge on and experience with geodesign tools remains limited.	High	Low	The living labs will introduce the local stakeholders to geodesign and the GDSE and guide users in a collaborative process of learning-by-doing. Moreover, the GDSE will be designed with user-friendliness as a core principle and marketed as a package including an accessible user handbook. Additional information and guidance will be offered via the website, while the teaching activities offered will include an introduction to the GDSE. Finally, the dissemination and communication activities will endeavour to sensitize future users to the benefits of geodesign and raise awareness among the general public of this approach as a tool for addressing the resource efficiency challenge.
Uptake barriers. The extent to which the lead users in regions beyond the case study areas will be willing to	Low	High	The consortium places a great deal of importance on targeted exploitation and communication activities related to the GDSE (WP 8), which are based on carefully thought-through plans. The uptake of the GDSE will be favoured by the activities of

use GDSE remains unknown. Regional and local governments can be wary of modelling tools.			the intermediaries between the consortium and the lead users, namely the industry and government partners involved in the consortium as well as the Advisory Board. Moreover, the consortium will also endeavour to reach out to and collaborate with national policy-makers, the relevant bodies within the European Commission, and other intermediaries on the promotion of the use of the GDSE among the regional and local authorities across Europe.
Barriers in access to data. Availability of data, for instance for sustainability assessment or for mapping illegal waste dumping, may be limited. In particular this concerns the regional/peri-urban scale on which REPAiR focuses.	Medium	Medium	In case of unavailability of data, the consortium will undertake fieldwork to collect it, drawing on the expertise and support of the government and industry partners in the case study areas concerned.

2.2 Measures to maximise impact

To maximise REPAiR's impacts, a set of actions for dissemination and exploitation has been planned, so that all stakeholders and potential users will realize the envisaged benefits of the project's outputs and that a way is paved for further deployment and exploitation. First, this section will describe the overall approach to dissemination and exploitation and then outline the specific dissemination strategy for the different target groups. Second, it will present REPAiR's approach to exploitation of its results. Third, communication measures will be discussed. The section will close with an outline of REPAiR's approach to research data and knowledge management.

2.2.1 Dissemination and exploitation of results

The overall goal of REPAiR's dissemination and exploitation strategy is to accompany the delivery of the project results with cleverly targeted actions so that all stakeholders and potential users realize the benefits of the project's outputs, thus stimulating exploitation of those outputs. More specifically, this strategy aims at ensuring:

- Effective and sustainable dissemination of the knowledge, tools and solutions developed by REPAiR across the entire European circular economy community, and through the implementation of suitable and specialized dissemination and communication activities for each of the project's identified target groups and end users;
- Exploitation of the project's results by end users within the governmental sector, the relevant industries and civil society stakeholders, the researchers' community and higher education institutions, so as to promote the shift towards a circular economy and reinforce the European Union's leadership (both in terms of technology and policy) in sustainable waste management;
- Interconnection with other industrial sectors beyond waste management with the potential to exploit the findings and outcomes of the project;
- Conveyance of new knowledge to the education base provided across European universities, so as to meet the evolving skill needs of the sector and train future leaders of the circular economy;
- Possibilities for exploitation of the REPAiR's results and foregrounds outside of the waste management field, e.g. in air quality management, renewable energy.

The inclusion of a comprehensive representation of the stakeholders within the consortium, the user board as well as the planned recourse to key intermediaries (the key representative and umbrella organizations for the different stakeholder groups, see 2.1.3) outside of the consortium make up the cornerstone of this strategy. Their extensive networks, expertise and the knowledge of the needs of REPAiR's target groups will contribute to effective dissemination and exploitation.

The primary objective of the draft REPAiR dissemination and exploitation strategy is to identify and organize the activities to be performed (during and after the project), in order to maximize its influence and while taking into account the dissemination needs of the project at each stage of its lifecycle, as well as the specific technical, market, organizational issues

and interests of each of the various pre-defined REPAIR target groups/end users. Consequently, the main aims of the planned dissemination and exploitation approach are to:

- **Disseminate knowledge** - Regularly provide information about the REPAIR outputs through carefully selected channels tailored to the target groups (see section 2.2.4);
- **Support REPAIR exploitation** - Pave the way for a successful exploitation of the project's results by addressing the full range of potential users and applications, including research, commercial, investment, social, environmental, policy making, setting standards, skills and educational training.

2.2.2 Dissemination strategy

The dissemination strategy of REPAIR focuses on three elements:

- **Project partners**, who represent all user categories and provide direct personal contact with colleagues and disseminate project information through channels appropriate to their peer groups;
- **User board**, consisting of the representatives of all user categories who will disseminate information about the project's results and its products to a highly targeted audience;
- **Broad range of targeted and tailor-made communications measures** to reach out to lead users and other stakeholders, as specified in Section 2.2.2.

The dissemination activities will focus on four target groups using tailored communication channels:

- **1. Researchers.** The dissemination activities will target researchers at universities and other research institutions working in a range of disciplines (spatial planning, economic geography, urban studies, regional science, environmental studies, organizational studies, or management). The dissemination to this group will enhance the understanding of urban metabolism and the potential of geodesign to promote better waste management and, importantly, will add to the on-going academic debates on circular economy topics. This in turn is expected to spur further research projects, cross-fertilization of ideas, and publications, thus offering a valuable contribution to knowledge. *Channels:* open access articles in leading peer-reviewed academic journals, presentation of the project's findings at national and international conferences, seminars and workshops, and the newsletter.
- **2. European Circular Economy community.** The dissemination strategy focuses on reaching out to the practitioners dealing with Circular Economy, including (1) the relevant public authorities operating at different scales (chiefly regional and local authorities) as well as (2) businesses dealing with waste management, both in the case study areas and in other European regions. These actors are among the Lead Users of GDSE. It is therefore essential to disseminate REPAIR's results among them in order to (1) promote the use of GDSE as a tool for promoting the use of waste as a resource; (2) raise the awareness of the importance of that issue; and (3) spur them to take action to turn the European ambition to build a circular economy into reality, both through activities within their respective remits and through collaboration among them. *Channels:* practice-oriented workshops in each of the case study regions, with particular attention paid on the promotion of the GDSE among the most relevant stakeholders.
- **3. Non-governmental organizations and the general public.** Dissemination to this group aims at building stakeholder awareness of the importance of the shift towards a circular economy and educating the general public. This in turn is expected not only to muster public support to efforts towards this European ambition, but also to promote the engagement of non-governmental organizations focusing on waste, sustainable cities and wider environmental issues in (1) scrutinizing the implementation of waste management policies and (2) in decision-making concerning these policies. *Channels:* seminars and workshops, newsletter, social media, features in online and printed media as well as informal contacts and networks that project partners have within their regions and beyond (other regions, national and EU level organisations).
- **4. Students.** A further target group are students in regional and urban studies, spatial planning, environmental studies, and other relevant disciplines. The underpinning aim here is both long-term and normative: to promote the values and good practice in waste management *by educating the next generation of decision-makers and ambassadors of the circular economy.* *Channels:* academic courses (including a MOOC to be developed with AMS Institute) on the circular economy and the use of waste as a resource (including student work contributing to a range of activities from data gathering, spatial analysis, flows analysis to generation of ideas for solutions to be applied in these regions) offered by the consortium universities, with educational institutions as partners to the research-oriented consortium-members (e.g. University of Pécs, University of Łódź).

The dissemination plan and the related dissemination kit (developed as part of WP8) will translate this strategy into be practice. They will provide concrete guidelines to all project partners to ensure that the channels of dissemination (see Table

2.2.1) are matched with the relevant project deliverables and with the identified groups of end users in order to ensure the outcomes of the project (at any stage) are shared with appropriate audiences and in a comprehensible manner. The dissemination plan will clearly define the double role of end users as target groups and as providers of critical input into the deliverables of all WPs, including the dissemination strategy itself.

2.2.3 Exploitation strategy

REPAiR will exploit the networks and knowledge of the consortium partners representing all user groups to pave the way for successful exploitation of the project's results. These activities will concern three REPAiR products with high potential for exploitation: (1) the GDSE, (2) the data produced in the research, and (3) the teaching materials (see Fig. 2.5).

The REPAiR team is very well connected to the European circular economy community through academic, policy and industrial networks, and will thus be able to directly reach out to and cooperate with the relevant external intermediaries (see section 2.1.3).

Many organisations and individuals in the REPAiR team have high profiles in their respective R&D fields and the project expects to publish regularly on its achievements in various outlets (see section 2.2.2). The consortium will thus address the full range of potential users and applications, including research, commercial, social, environmental, policy making, skills and educational training. The consortium partners will support the target groups of users in implementing the project's products during its duration and after its completion.

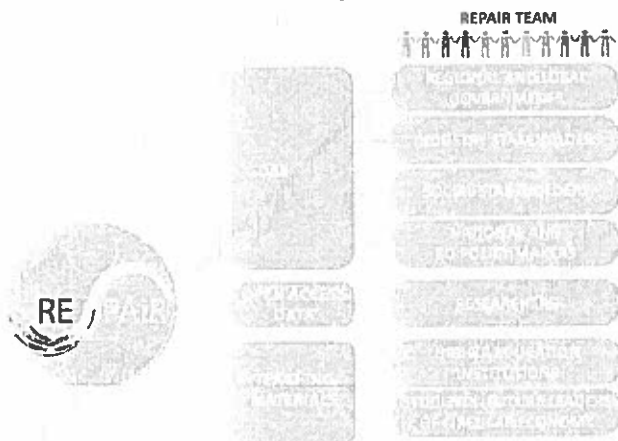


Figure 2.2a Exploitation of REPAiR's results

Moreover, to ensure the realization of the exploitation strategy, the workshops organised within PULLs in case study areas will be an opportunity to gather feedback and input from local and regional authorities and industry stakeholders on the design of the GDSE and on the formulation of a detailed exploitation plan (WP 8). The exploitation plan will be produced in the project's final year and provide specific exploitation guidelines for the three different user groups.

These groups include:

- 1. GDSE Lead Users.** This group comprises experts in regional and local authorities (e.g. spatial planners, urban designers, waste management and sustainability officers), industry (businesses dealing with waste, sustainability, and/or urban planning and design) as well as social stakeholders (e.g. non-governmental organizations dealing with waste or environmental issues, local inhabitants groups). Focusing on those Lead Users will ensure the realisation of the core goal of the exploitation strategy: the uptake the GDSE, which in turn is expected to enhance waste management and urban metabolism in the case study areas and other European regions. The feedback on the GDSE from this group will be gathered during the workshops in PULLs. This activity will be essential in making sure that the GDSE matches their needs and will therefore increase the chances for its future uptake. Moreover, the GDSE will be promoted among this group of users by presentations at various events at the national (policy conferences, workshops) and EU (e.g. Open Days) levels. Finally, the user board and the governmental and industrial consortium members will use their networks acting as exploitation intermediaries between the consortium and the Lead Users.

- 2. Researchers.** The researchers dealing with waste management or urban metabolism issues will be able to use the data and other qualitative materials achieved through REPAiR's lifetime for further research projects. Examples of the data to be made available include the sub-models of the GDSE, GIS-based maps and data on actor networks. The availability of this data will be publicised as part of the communication activities targeting researchers.

- 3. Higher education institutions and students.** REPAiR will produce open access teaching materials to provide a basis for the elaboration of study programmes related to urban metabolism and the circular economy. These materials will include a syllabus, reading materials, visual aids, lecture scripts and student assignments descriptions that will be available free of charge for use (and possible adaptation) by academic institutions from across the world.

2.2.4 Open source and post-exploitation

An important aspect of the exploitation strategy is the commitment to distribution of the GDSE under an open source license and using a code-sharing platform (e.g. Github). Partners from TUD, GGR, Geo-Col and JRC will form the core

development group. The open source community of first users, including software developers and users within the relevant public authorities and the industry, continue to develop the applications following commonly defined requirements and with well-defined implementation rules to extend and improve the product, and to cater to the needs of the Lead Users of the product. A key requirement is that the GDSE code's intellectual property (IP) is clear and that source code developed in the project is reusable. This approach will make the GDSE easily and freely available to first users to apply, adapt and improve for different contexts, thus significantly increasing the potential market for it and providing the opportunity for continuing innovation. The open source model, in fact is an **excellent strategy for encouraging exploitation, take-up, use and continued development of the GDSE**, because users can be assured that the software will continue to be available and be improved by its user community. The open source platform will make it possible to develop new products (eventually under proprietary licenses) on top of the platform as required by some of the industrial partners to address the needs of their customers and protect their IP.

In summary, using the open source model will help improve the exploitation potential for the GDSE. The collaboration and documentation platform will be a great tool to support continuing development of the GDSE and research on improving waste management. The project partners themselves plan to use it for continuing their own research and product development, and believe it can become a hub for advancing the waste management practice.

2.2.4 Communication activities

Communication activities will provide the tools to implement the project's dissemination and exploitation strategies, giving it proper visibility and ensuring diffusion of regular information on progress and results. The first target of these activities will be the consortium partners themselves – up-dated information made easily accessible for exchange and discussion between partners is a key factor of success. Secondly, the communication activities will address all the above mentioned target groups, using a language and terminology adapted to their respective fields. Moreover, the stakeholders from within the consortium and the stakeholders and customers of the consortium partners will receive information communicated in an appropriate way, both in terms of form and content. To this end, a communication plan will be provided to all partners, laying down the communication strategy, activities and material planned. The communication channels to be used by REPAiR are summarized in Table 2.2.a

Table 2.2.a. REPAiR's communication means

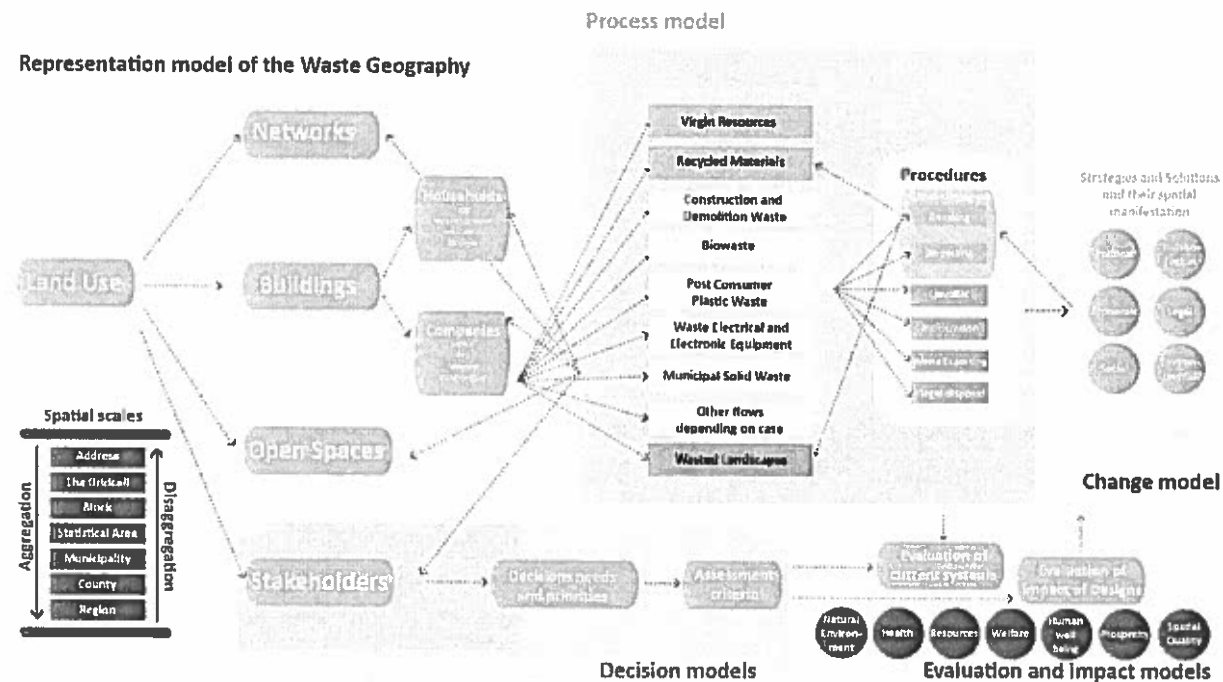
Communication means	Target groups	Objectives / Impact	Performance indicators
Website	All target audiences	The website will provide a one-stop-shop for communicating all information about the project, news, publications and other deliverables. The website will also serve as an interface for third parties through which they will be able to interact with the consortium.	Number of visitors and downloads of the materials provided per month.
Corporate Identity	All target audiences	Corporate Identity will ensure the recognisability of the project across all materials, media channels and stakeholders.	-
Social media	All target audiences	Social media presence has become the most effective communication means. It will allow for keeping the relevant targets groups informed of the project's milestones, events, and outputs. It will also allow for expanding the potential audience.	Number of followers, 'likes', 'retweets'
Newsletter	All target audiences	Newsletter will allow for keeping targets groups interested and informed on the project's milestones, events, and outputs. Newsletter will complement communication via social media with additional, more extensive content.	Number of subscribers.

All communication activities will follow the **guidelines for corporate identity**, to be elaborated as part of WP8. The strategy will define guidelines for the visual presentation of all communication documents (website, newsletter, social media, reports and other publications, etc.) and outline how these materials are to be used in the promotion and presentation of the project.

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What types of data will the project generate/collect?

In general, the project will generate a variety of data related to waste and resource management in six European case study areas. This includes data on resource flows and stock (life cycle inventories including not only inputs, but also outputs and energy flows), households, companies, and open spaces. Additional data on the decision needs of the key stakeholders will be collected. Data will be quantitative and qualitative. Most will be geodata, but other types of data will be generated, including photographs, audio files, images, maps, blueprints, etc., resulting from measurements, interviews, or collected from local authorities. Design proposals are a very specific type of data in the case of REPAiR, which very often will take the form of diagrams or policies. In order to make the basic data available and allow a variety of analysis, predictive and assessment models will be performed that also generate data. The integration of different data sources and models is crucial for REPAiR. Figure 2.6 shows a first setup of the data flow and its relation to the different GDSE models.



2.2b REPAiR setup of the data flow and its relation to the different models of the GDSE

What standards will be used?

REPAiR will use the OpenEarth DataLab provide by 3TU.Datcentrum specifically developed as an online data management working environment for scientific and monitoring data. The OpenEarth DataLab enables collaboration on data standardisation. REPAiR will as much as possible use standards that follow the Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE), as well as related regulations on metadata, data specifications, network services, data and service sharing and monitoring and reporting.

How will this data be exploited and/or shared/made accessible for verification and re-use?

For this aspect, REPAiR also uses the Open Earth Data Lab, where data can be safely stored, shared, edited, processed and visualised. The Data Lab allows uploading and sharing of raw data, scripts, models and data generated within the REPAiR consortium. Once data is uploaded, group members can run Python and Matlab scripts in the cloud. The processed data can be shared again in standard formats. This enables reviewing and improving the scripts that run on the data, thereby increasing the overall quality of the data and analysis.

Data gathered by REPAiR will be made openly available once it has been anonymized in such a way that it cannot be tracked back to individual respondents, directly or indirectly. Data not produced via the project (e.g. existing cases, existing survey data, existing data from statistical offices) will not be made openly available. Data gathered by REPAiR will only be made openly available as long as it does not harm privacy or competitiveness of the business being studied. All sub features and models developed for the GDSE will be openly available to the open source community. The data that is suitable to make open available (including necessary documentation, metadata, code, consent form, software, etc.) will be stored and made

open available in [3TU.Datacentrum data archive](#) under the [Deposit License](#) agreement. By doing so, 3TU.Datacentrum is granted a non-exclusive licence to store the data and make them available to third parties. For data users, the [General Terms of Use](#) applies. These terms specify that, when re-using the data, they will clearly state the name(s) of the original author(s) and that the data will not be used for commercial purposes. 3TU.Datacentrum data archive is a long term archive with a Data Seal of Approval.

How will this data be curated and preserved?

Once a dataset has been completed and is ready for publication, the data set will be transferred from the Open Earth Data Lab to the 3TU.Datacentrum data archive for long-term storage. The 3TU.Datacentrum data archive (<http://datacentrum.3tu.nl>), is a Trusted Digital Repository for technical-scientific research data in the Netherlands. Each dataset deposited will be provided a digital object identifier, or DOI, that facilitates discoverability, accessibility, and re-use. 3TU.Datacentrum has been included in the DataCite search engine and Thomson Reuters Data Citation Index (DCI) to aid data discovery.

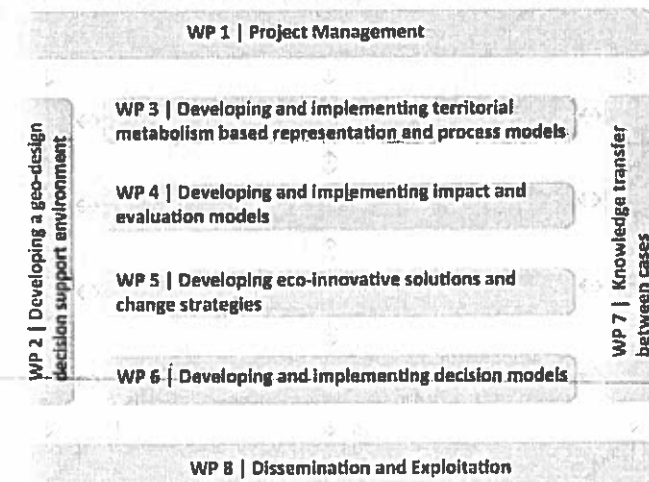
2.2.5 Knowledge management and protection

Intellectual property rights (IPR) protection will be agreed upon on the basis of the consortium and grant agreements. As a general rule, inventors or their employers will own results realized within REPAiR. Specifications will be incorporated in the consortium agreement. A method will be defined during the first months of the project for ensuring approval of each planned publication across the consortium, and especially among the involved parties, when and if potentially patentable results are obtained. The Dissemination and Exploitation Manager, DEM (Magdalena Górczyńska, IGIPZ, the leader of WP 8) will be responsible for monitoring all planned dissemination and exploitation activities so as to ensure that the consortium agreement and grant agreement requirements are respected and that the involved parties' IPRs are properly protected from unauthorized use or any other kind of misuse.

All partners will be responsible for publishing project results in appropriate media, e.g. local and international press, peer-reviewed scientific journals and conferences. All scientific publications resulting from REPAiR will be published in open access mode.

Depending on the nature, importance, cost and available budget, a decision will be taken by the coordinator in cooperation with DEM and the proposing partner as to the most appropriate open access scheme. A dedicated budget for open access scientific publications has been reserved. Alternative repositories such as the Open Access Infrastructure for Research in Europe (OpenAIRE), the Registry of Open Access Repositories (ROAR) and the Directory of Open Access Repositories (OpenDOAR), etc., will also be exploited, as these are supported by the European Commission and there is no cost related to using these repositories. In all cases, as soon as possible and at the latest within six months of publication, DEM will be responsible for collecting a machine-readable electronic copy of the published manuscript for deposit in the project website either as a reproduction, if permitted by the publisher, or as a direct link to the publication. In addition, the research data and bibliographic metadata needed to validate the results presented in the deposited scientific publications will be stored in an appropriate area of the repository.

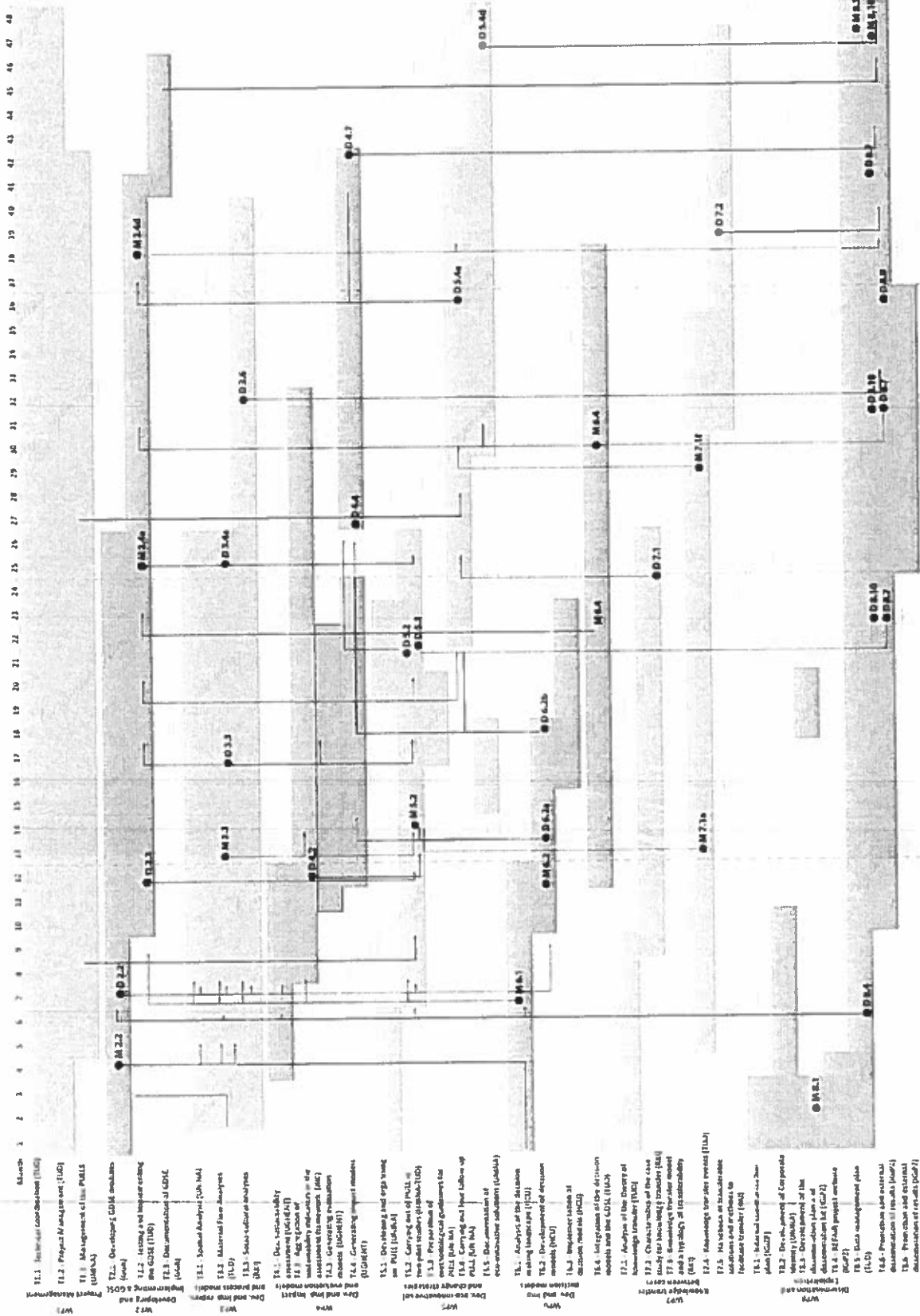
3.1 Work plan – Work packages, Deliverables and Milestones



The project has a duration of 48 months. REPAiR's structure is built upon the six questions and models of the geodesign framework and is organised in two levels, as shown in Figure 5. The work is divided into 8 work packages as described above. A PERT chart is provided in Figure 3.1a to show the relationship between the different work packages and the partners involved.

Except for the (non-technical) management work package, a different partner leads each work package, with each having a relatively large number of partners. This is a result of the transdisciplinary nature of REPAiR, with every WP requiring

input from several academic fields as well as input of specific technical and place-based knowledge. Each work package consists of several tasks. To give a more detailed insight into the timing and dependencies between all tasks, a Gantt chart is provided in Figure 3.1b. Following the Gantt chart, detailed work package descriptions (Table 3.1a) are provided followed by the list of work packages (Table 3.1b) and the list of major deliverables (Table 3.1c). .



2.2.1 Detailed Work Description

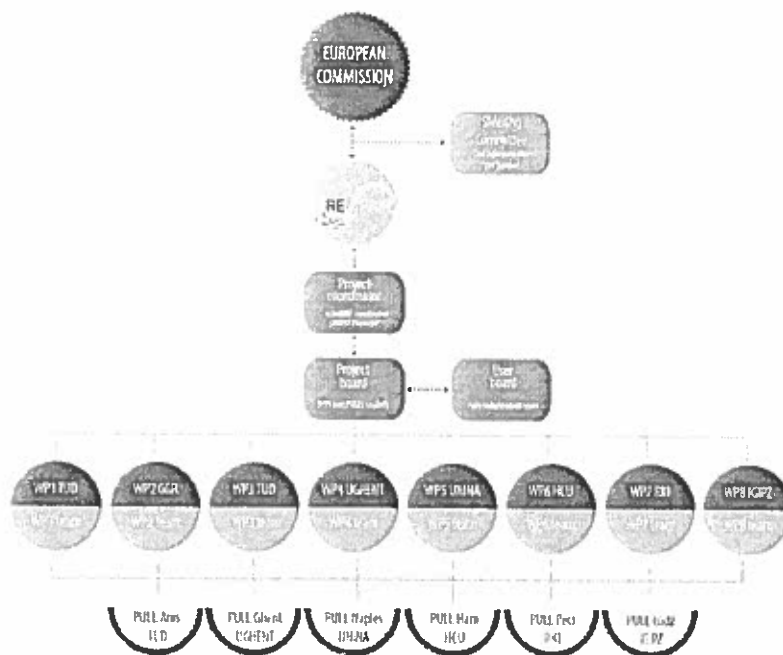
The tables in Part A describe the detailed work description by work package. Deliverables, which have to be produced for all six case studies, are indicated with lower case letters behind the two digits.

2.2.2 Management Structure and procedures

2.2.1 Organizational Structure

The management of REPAiR has as its major task ensuring the support, coordination and facilitation of the consortium activities in the project as a whole. Measures are included to ensure that the required quality levels are met and that the impact as described in the previous section is achieved. Project management techniques will be used to monitor that all scheduled activities are carried out on time. In particular, special effort must be directed towards harmonisation of work progress in the case of crucial interdependencies of activities, within or across work packages (WP's). This is specifically important for multidisciplinary consortia, so REPAiR includes a handbook, which ensures a common understanding of concepts and methods, as an early deliverable in every WP.

The management structure of the project will be kept small, but efficient enough to support the realisation of the project's objectives with the consortium and within the defined budget limits.



Roles & Consortium Bodies

Each consortium member can have one or several roles in the project. All consortium members are represented in the **Steering Committee (SC)**. TUD has the role of *technical coordinator*, assisted by a *project manager* from the same organisation. A number of consortium members are responsible for monitoring and ensuring progress on specific activities in the role of *Work Package Leader*. Moreover, some members are key responsible for the organisation of a specific PULLs. WP leaders and PULLs leaders together form the project board.

Figure 120 REPAiR Management Structure

Consortium members

The individual consortium members are responsible for executing the tasks allocated to their organisation and to safeguard the timely delivery of results (deliverables) and the required quality level. They are also responsible for the coordination, within their WPs and with other WPs, of their activities especially where they relate directly to the work and progress of other participants. Coordination of the entire project is built into the WP structure and the overlapping membership of the WP teams. In each technical WP there are at least <four> consortium members involved and each consortium member contributes to at least two of the technical WPs. This is an ideal situation for promoting cross-fertilisation between the WPs and an exchange of expertise between consortium members. In principle, all consortium members have the facilities and expertise to individually execute the tasks as described in the description of work. For most of the tasks, there is a complementarity as well as a partial overlap in specific expertise, such that should any consortium member be unable to perform its task in a WP or part of it, this task could likely be taken over by one of the other consortium members.

2.2.2.1 Project Management

The coordinator maintains the project-wide overview, promoting synergy, identifying possible inconsistencies and generally overseeing implementation. The coordinator is supported in this work by work package leaders who oversee workflow, research

and development activity coordination and progress, and specific project results in the allocated work package. The coordinator is responsible for the coordination of the project as a whole and as such forms the point of contact for the European Commission representative and is furthermore responsible for project management of both technical content and administrative procedures.

The project coordination is performed at two levels:

1. The technical coordination for the scientific development of the project. The main responsibility of the coordinator is to ensure that the main goals of the project are pursued, to facilitate smooth collaboration within the consortium and to verify the quality of all deliverables.
2. The project management and administration support the activities performed by the consortium. The project manager will perform the following tasks:
 - Acting as liaison with the European Commission;
 - Monitoring contractual obligations, reporting duties;
 - Compiling legal documents, the contract and annexes, consortium agreement, etc.;
 - Submitting deliverables and project reports;
 - Performing budget control and financial management;
 - Overseeing progress control (deadlines, deliverables, etc.);
 - Co-organising project meetings (together with host partner).

Before the contract is signed and the project can begin, a Consortium Agreement (CA) will be drawn up and signed by all consortium partners. It is a legal document containing the rights, obligations and responsibilities of all consortium partners including but not limited to their liability, confidentiality rules, access to and protection of knowledge, protection of intellectual property rights (IPR). It is based on the DESCA model contract, elaborated by academic and industrial parties all over Europe.

WP and PULLs Leaders

A WP leader is appointed for each work package to coordinate and oversee the WP activities. In principle, the representative of the partner with the largest number of person months involved in the particular WP is the WP leader. Notwithstanding the task of the WP leaders, the responsibility of the proper coordination and execution of the entire project formally remains with the coordinator and the consortium as a whole. The WP leaders are responsible for monitoring the milestones and deliverables in their WP and will maintain close and frequent contact with consortium members involved in their WP. For each PULLs, a PULLs leader and a management group are defined. It's the PULLs leader's responsibility to organise and coordinate a PULLs. WP leaders can also be PULLs leaders.

User Board

To support the work of the consortium and the steering committee and advising on the road ahead and the quality assurance of outputs produced. A user board is established. The task of the user board is to monitor adherence of project deliverables to the needs of future GDSE users. The user board will consist of around 20 members primarily from regional and city planning authorities, as they are the future key GDSE users. The user board is complemented by members of GO and NGOs that have a stake in developing a circular economy or the sustainable development of peri-urban areas (PURPLE). The user board will play a crucial role in testing and further developing the GDSE and will therefore be invited to join the regular project meetings, in particular the kick-off meeting and the knowledge transfer and GDSE testing workshops during the PULLs.

	Name	Affiliated to
1	Professor Renato Bocchi	Re-cycle-Italy
2	Professor Karolina Dmochowska - Dudek	University of Łódź
3	Andrzej Górczyński	Agricultural chamber in Łódź Province
4	Przemysław Andrzejak	Łódź Regional Development Agency

5	Malgorzata Grodzicka-Kowalczyk	Lódź Regional Development Agency
6	Sabine Hilfert	Frei Hansestadt Hamburg – District of Altona
7	Sally Talbot	Municipality of Staffordshire - PURPEL
8	Dr. Zoltán Horváth	Government Office of Baranya County
9	Oliver Stolz	County of Pinneberg
10	Daniel Termont	City of Ghent
11	Dr. Laszlo Sitany	STRDA South Transdanubian Regional Development Agency Nonprofit Ltd.
12	Luigi de Magistris	Mayor of City of Naples
13	Sietse A. Agema	AEB Amsterdam
14	Janos Giran,	deputy-mayor, Municipality of Pécs
15	Fonz Dekkers	EVOLV, ASU's Global Sustainability Solutions Services
16	Eveline Jonkhoff	Sustainability Manager, City of Amsterdam

3.2.2 Decision-taking by the Steering Committee (SC)

Formal decisions are taken by the steering committee, which is the formal representation of the consortium as a whole. The SC consists of one representative of each consortium member and convenes at least every six months at the progress meetings. Besides scheduled meetings, SC members will be in contact as often as required to discuss and monitor the project activities of the consortium. The SC takes the following types of decisions:

- Decisions related to the entry of new participants, the exit of existing ones and major shifts in tasks;
- Other decisions related to alterations in contract and budget;
- After quality check of technical coordinator, decision to accept/reject deliverables;
- Planned publications and other dissemination actions;
- All other decisions affecting the project as a whole.

For the sake of simplicity, the WP leaders and the coordinator will not have separate meetings, but instead their interaction is integrated into the project steering committee meetings. Decisions can only be taken in the SC meeting if more than half of the members are present. Decisions concerning individual partners will be based on the principles of equity and fairness. This implies, among other things, that the affected participant should be informed well in advance of the meeting and that the meeting date should be set in cooperation with that partner as much as possible. All decisions of the SC are taken by simple majority where in case of a tie, the coordinator will have the deciding vote. In addition to the 6-month consortium meetings, the SC may organize telephone meetings and written voting procedures may be organized if necessary. Additional rules on decision-making and notification of agenda items will be included in the consortium agreement.

3.2.3 Management procedures

Communication strategy

Project communication and dissemination with external stakeholders will be established by partner IGiPZ in WP 8. A project website will be built, which will have a public section containing general, non-confidential information, as well as a section restricted to the participants, accessible via personal password. The restricted section will be used to store and exchange information in digital format. Information sheets, project documents, agendas and minutes of meetings and reports will be stored and made accessible by the coordinator for later reference. Individual partners will upload their progress reports and deliverables descriptions, as well as any other products of knowledge dissemination, such as scientific publications or

conference presentations related to the work in the project. Phone and e-mail contact will be used for day-to-day work discussions among consortium members involved in the same activity.

Method of monitoring progress

For monitoring the progress of the scientific work, the consortium has a number of instruments at its disposal (see details below), the most important being:

- The progress meetings;
- The progress reports;
- Milestones and deliverables reviews;
- The mid-term and final reviews.

Progress meetings

The primary meeting events to exercise control and progress monitoring are the SC meetings, which are held every 6 months. At these progress meetings all consortium members are expected to be represented, preferably by their primary responsible, otherwise by a delegated person directly involved in the work of the project. The absence of a consortium member at the meeting can only be accepted in exceptional circumstances, in which case special effort has to be devoted to the quality of the progress report, subject to the approval of the coordinator. At the meetings both scientific results and work progress are reported, either by each partner individually, or in synthesis by the WP leaders, as deemed appropriate by the GA. The 6-month meetings will typically cover one-and-a-half to two days, to allow for sufficient time for presentation of results and discussion of progress. For discussing issues of a purely managerial nature, the SC may organize a separate meeting. In addition, the GA, or a subset thereof, may decide to schedule intermediate meetings if circumstances arise that make this advisable.

Progress reports

Each partner will prepare and submit a progress report to the coordinator every 6 months. In this progress report the results of recent activities are to be reported, the progress in relation to the original project time schedule and the activities planned for the next 6M period. The progress reports are supplementary to the formal deliverables, but may contain elements of them, where appropriate. In case of deviation from the original project schedule, the reasons for this and proposed contingency plans should be addressed. Notwithstanding this, any participant who encounters a problem that may cause a delay in the program is obligated to immediately inform the coordinator and the corresponding WP coordinator, as well as any other participant who may be affected by this delay.

The coordinator will provide a general format/template for the reports to be delivered by the partners. When deemed appropriate by the consortium, the WP leaders will also prepare additional progress reports to synthesize the joint work in the work package. For the mid-term and final reports, the WP leaders will serve as editors for the WP-specific sections, while the coordinator will have final editorial responsibility for the compilation of the complete reports.

Milestones and deliverables review

Specific milestones and deliverables are defined for each WP. Milestones should be clear intermediate GO/NO GO moments and as such become project management tools to measure whether the project is still on track. They are also part of the Gantt chart. The list of deliverables is included in table 3.1.c. The list of milestones is included in table 3.2.a. The progress of the activities in each WP and the outlook for results exploitation will be critically reviewed and compared to the planning and criteria described in the work program. This is primarily the task of the WP leader. The coordinator's team will include a dedicated person who will guarantee the quality management of the deliverables, preferably the technical coordinator. Necessary changes will be decided and implemented. A list and database of all deliverables and publications will be kept and updated by the coordinator, who will be in contact with the WP leaders to monitor progress.

Mid-term and final review

For the mid-term assessment (at month # 24) and the final assessment (at month # 48) a special review meeting will be organized with the representative of the European Commission. The purpose of the mid-term assessment will be to report on the progress to-date and to redefine, if necessary, the project programme for the remainder of the contract. Procedures for managing future exploitation of results will be discussed and assessed. In consultation with the EC officer, external reviewer and possibly members of the advisory board and innovation board will be invited to the mid-term and the final review meetings.

They will be asked to report on project progress. The EU officer and the coordinator will jointly decide how the expenses of the external reviewers will be reimbursed.

Budget control

Budget control and financial management, including the coordination of declarations or payments from or to consortium partner, is to be carried out by the project manager. Verification of cost declarations is made in accordance with the requirements of the EU for the H2020 funding scheme. As coordinator, TUD has access to a large pool of previous knowledge and experience in European-funded projects (in FP7, TUD had over 400 projects, of which 39 as consortium coordinator).

3.2.4 Appropriateness of project management measures

Given the size of the consortium, the management structure will be kept small, with only the minimum number of consortium bodies, to ensure efficient communication flows and avoid unnecessary paperwork. There will be three levels of responsibility: the coordinator and project manager for the entire project, the WP leaders for their respective WPs, and the consortium members for the activities that have been assigned to them. This will result in a flexible management structure that will allow for identifying any deviations from the work plan at an early stage and implementing any necessary corrective actions at short notice.

3.2.5 Effectiveness of innovation management

The structure of the work plan itself is designed to maximise impact on the GDSE. The use of a series of PULLs provides internal and external feedback loops to verify adherence to expected quality levels. The structure of the project enables revising the planning if and when necessary or opportune. Important stakeholders are to be included as consortium members from the beginning and have helped formulate the concept of this project. Additionally, external representatives of the industry value chain provide input both on the overall assumptions and on essential aspects of the project. Their feedback will be sought at intermediate stages of development and specifications can be adapted according to the perceived needs of the sector.

3.2.6 Risk management and handling of conflicts

The systematic progress of the work of REPAiR is secured by monitoring deliverables and progress reporting at the 6M meetings. The latter serve as regular moments where the consortium convenes to report and assess the status of the work of the individual participants, as well as consortium performance as a whole. Any existing or potential problems will be identified at such occasions. In similar European collaborative projects this has proven to be a very effective procedure, resulting in a mechanism of self-control and self-adjustment, which usually makes it unnecessary to explicitly enforce strict measures on progress recovery by the SC. Experience shows that for a consortium of specialized and professional partners, such as assembled in the REPAiR consortium, most difficulties that appear constitute only minor or temporary deviations from the work program, which can be easily managed by the partners themselves.

The procedure to handle conflicts is first to treat them at WP level. If a solution cannot be found, the WP leader reports the conflict to the coordinator and the coordinator attempts to find a proper solution. If this fails, the issue is taken to the following SC meeting. For urgent questions, a video-conference between the partners or an extraordinary SC meeting can be called.

In case of more serious problems that may demand a specific action, such as a modification of the work plan or even task distribution among partners, including modifications to the consortium budget distribution, the following actions will be undertaken:

- identification of the main risks and the potential causes;
- identification of the impact of the risks on the project objectives, resources and budget;
- analysis of possible mitigation plans to reduce the risks, in close cooperation with the affected partners;
- preparation of recovery plans;
- decision making by voting at the Steering Committee meeting.

All the above actions will be instigated by the coordinator but will be realized in full cooperation with the SC and when necessary in consultation with the EU programme officer.

The consortium REPAiR is technically competent to develop the GDSE and well-balanced, as it brings together expertise from the best European universities, research institutions, local and regional authorities and leading businesses in waste treatment and circular economy development and SMEs leading the development of spatial decision support systems. The partner selection and work distribution have been done strictly according to the distribution of competences as well as knowledge and involvement in resource management and development of the circular economy within the case study areas. The need for a European approach is evident, as none of the partner countries alone could reach the proposed aims and objectives with resources available at a national level. The consortium is completed by the project office of the TU Delft Valorisation Centre, which is in charge of the administrative, legal and financial aspects of the REPAiR project in close cooperation with the scientific coordinator from TUD.

1. a group of scientific institutions complementary to each other in their key expertise and who provide with their teaching facilities one way of generating manifold designs for the development of the circular economy.
2. a group of local and regional authorities, which is crucial to embed the project within the local decision needs as well as make the outcome relevant for the local and regional authorities in place.
3. A group of companies that are experts in waste treatment as well as in implementing circular economies. Those are also crucial for the local embeddedness of the project and to insure its future impact.
4. A group of companies that are experts in the development of GDSE and combine ICT expertise, with expertise in spatial planning as well as process organisation.

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DELTA				E			E					E
BIOKOM							E		E			E
GGR			E		E	E		E		E		
OVAM	E						E		E			E
GHM								E		E	E	
CRA				E						E	E	
PHH										E		E
BMU							E					E
IVAGO							E					E
SRH							E					E

4.4 Resources to be committed

The requested budget for the REPAIR project equals EUR 5.089.636. The tables below shows the detailed break down. The largest amount of the budget is reserved for direct personal cost. Its distribution is directly linked to the to the person months assigned per WP. Therefore, a summary of staff effort is provided in table 3.4.b The distribution of workload and budget shows clearly that those partners, who are responsible for a PULLs, have a significantly higher PM number, than those who contribute to the PULLs. The exception are GGR and JRC, the first plays a key role in the development of the GDSE, the second plays a key role in WP3 to 5. Therefore, both have been assigned a similar PM number as the PULLs organising partners. The significant difference between the % of Budget and % PM assigned between partners is the result of the extreme differences in average person month rates between western and eastern European countries.

Table 3.4.b Summary of staff effort

		WP1	WP2	WP3	WP4	WP5	WP6	WP7	WP8	Total PM
1	TUD	21.5	17	15	12	17	4.7	10	12	109.2
2	UGHENT	0.5	2	12	26	5.5	1	3.2	3	53.2
3	UNINA	1	3	11	3	33	1	5.2	4.1	61.3
4	HCU	0.5	5	9	2	2	18	4.2	2.1	42.8
5	RKI	0.5	4	22	10	9	20	20	4.6	90.1
6	IGIPZ	0.5	3	13	10	9	2.4	7.1	13.1	58.1
7	JRC	0	1	10	24	5	0.7	0.4	6.1	47.2
8	Geo-Col	0	10	2	2	2.5	0.7	0.4	1.1	18.7
9	Delta	0	1	1	1	3	2	1	1.6	10.6
10	Biokom	0	1	1	1	3	0.7	3.4	3.1	13.2
11	GGR	0	29	1	2.5	1	0.4	0.4	2.6	36.9
12	OVAM	0	1	1	3	3	4	0.4	1.6	14
13	GMH	0	1	1	0	3.5	1	0.4	1.1	8
14	CRA	0	1	1	0	6	1	0.4	1.1	10.5
15	PHH	0	1	1	1	5	1	0.4	1.1	10.5
16	Bauer	0	1	1	1	3	0.7	0.4	1.1	8.2
17	IVAGO	0	1	1.5	0.5	3	1	0.4	1.1	8.5
18	SRH	0	1	1	1	3.5	1	0.4	1.1	9
Total Person Months		24.5	83	104.5	100	117	61.3	58.1	61.6	

A significant share of the budget is reserved for other direct costs, predominantly for travel and other goods and services. The cost of data acquisition (EUR 100,000), as well as the OpenEarth Data Lab (EUR 25,000) amount to the biggest share of costs for other goods and services and are a result of the lack of existing data on the peri-urban scale. For eight participants, the other direct costs exceed 15% of their respective personnel costs. This is detailed in table 3.4b.

1: TUD	Cost (€)	Justification
Travel	€ 67.200.00	Travel (including accommodation and allowance) cost of scientific staff from the Faculty of Architecture to: Project meetings, 4 persons 2 meetings per year at 800 Euro = 25,600 PULLs in the other case study areas. 3 persons x2 per year at 1.400 Euro 33,600 Travel costs (including accommodation and allowance) of project manager to bi-annual project meetings: €8.000
Equipment	€ 25,000.00	Equipment, including: Smart boards, laptops/tablets and related software licenses specifically configured and used as interactive devices for the PULLs. for the GDSE development during the PULLs in Amsterdam, partly to be reused in the follow up studies. 25,000 Euro for data management using and further developing the 3TU Open Earth Data Lab 50,000 Euro traveling cost for the User board 100,000 Euro for Data collection and acquisition in all cases. 12,000 for open access publishing 15,000 for dissemination activities like conferences and final event. 3,000 translations 6,900 Euro for organising PULLs
Other goods and services	€ 211,900.00	
Total	€ 304,100	

3: UNINA	Cost (€)	Justification
Travel	€ 46,400.00	Travel (including accommodation and allowance) for project meetings 2 persons for 2 meetings per year each 800 Euro = 12,800 EUR Travel (including accommodation and allowance) for PULLs in the other case study areas. 3 persons x2 per year at 1,400 Euro 33,600 EUR
Equipment	€ 25,000.00	Equipment, including: Smart boards, laptops/tablets and related software licenses specifically configured and used as interactive devices for the PULLs. for the GDSE development during the PULLs in Naples, partly to be reused in the follow up studies. 8,000 EUR for open access publishing 6,000 EUR for dissemination activities like conferences and final event. 3,000 EUR for translations 1,000 EUR security for fieldwork if necessary
Other goods and services	€ 18,000.00	
Audit costs	€ 10,000	
Total	€99,400.00	

5: RKI	Cost (€)	Justification
Travel	€ 32,250.00	Travel (including accommodation and allowance) to: project meetings (3 persons) € 17,000 selected PULLs (1-2 persons):) € 7,250 dissemination conferences: € 8.000 2,000 EUR Smart boards, laptops/tablets and related software licenses specifically configured and used as interactive devices for the PULLs. 1,000 EUR ATLAS.TI software (or equivalent) for content analyses
Equipment	€ 3,000.00	

Other goods and services	€ 13,250.00	1,600 EUR of participation fee of the conference in the dissemination phase. 1,000 EUR of book and periodical purchasing and renting for research; 1,000 EUR of consumables and supplies for research 2,800 EUR for English proofreading, 3,350 EUR costs (room rent, catering) of 1 project meeting for project partners 3,500 EUR for organizing the PULL
Total	€ 48,500.00	

6: IGIPZ	Cost (€)	Justification
Travel	€ 29,800.00	Travel (including accommodation and allowance) for 7 project meetings with 2 persons (kick-off: 4 pers.; closing 4 pers.); participation in PULLs in other countries; participation in conferences with 2 people in order to disseminate the project results as WP8 leader.
Equipment	€6,500.00	Smart boards, laptops/tablets and related software licenses specifically configured and used as interactive devices for the PULLs..
Other goods and services	€ 11,000.00	Organizing project meetings, meetings with local stakeholders translations costs attendance in conferences as well as open source publishing
Total	€ 47,300.00	

10: Biokom	Cost (€)	Justification
Travel	€5,500.00	Travel (including accommodation and allowance) for project meetings for 1 person 2 times per year and attendance at selected PULLs.
Equipment	€ 0	
Other goods and services	€ 0	
Total	€ 5,500.00	

15: PHH	Cost (€)	Justification
Travel	€ 6,000.00	Travel (including accommodation and allowance) for project meetings for 1 person 2 times per year and attendance at selected PULLs.
Equipment	€ 0	
Other goods and services	€ 0	
Total	€ 6,000.00	

16: Bauer	Cost (€)	Justification

Travel (including accommodation and allowance) for project meetings for 2 persons 2 times per year and attendance at selected PULLs.

Equipment	€ 10.000,00	Estimated compensation for pilot treatments at Laboratories and Soil Treatment Centres – no new infrastructure is purchased.

Other goods and services	€ 15.000,00	4000 €: waste analysis 7000 €: waste consulting 2000 €: collection and validation of data 2000 €: additional storage capacity

Total	€ 37.000,00

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1. Numbers of the consortium

1.1. Participants (applicants)

Participant 1 - Delft University of Technology (TUDelft) - The Netherlands.



Delft University of Technology, (Dutch: *Technische Universiteit Delft* or *TUD*) is the largest and oldest Dutch public technical university, located in Delft, Netherlands. It established in 1636, has a long history with a rich tradition, and has developed into a large and multifaceted international knowledge centre of academic and scientific excellence. The University aims to sustain its position as a research institution of the highest international quality, and to provide clear research focus areas with a particularly interdisciplinary approach. The University collaborates with other international educational establishments and research institutes and has partnerships with governments, branch organizations,

numerous consultancies, the industry, and companies from the small and medium business sectors. TU Delft ranks 42nd on the 2014 The World Reputation Rankings list. With eight faculties and numerous research institutes it hosts over 19,000 students, more than 3,300 scientists and more than 2,200 people in the support and management staff. According to the University Ranking by Academic Performance (URAP) Research Laboratory (2014) TU Delft is the most influential scientific Institution in the field of the Built Environment and Design globally.

Within REPAiR two TU Delft institutions are involved: The **Faculty of Architecture and the Built Environment** as well as the **Valorisation Center** with the responsibility of project management. Additionally the AMS will be involved in dissemination activities.

The **Faculty of Architecture and the Built Environment (AR)** at TU Delft, established in 1904, has a leading role in the area of education and research for the development of a more sustainable built environment. As one of the largest architecture faculties in Europe and leading design academy, the Faculty of Architecture and the Built Environment plays a key role in design-oriented research. On the latest QS World University Rankings by Subject 2015 (Architecture / Built Environment) TUD's faculty of Architecture ranks third. Three different departments of the faculty collaborate within REPAiR, The Department of Urbanism, the Department of Architectural Engineering & Technology and the Department of Management in the Built Environment (formerly Real Estate & Housing).

The **Valorisation Centre (VC)** at TU Delft supports, stimulates and facilitates scientists and supporting staff of the TU Delft in transforming results of research and technology development to practical and commercially viable applications. Within the VC European project management team, professional project managers provide non-scientific project management for international collaborative projects, including FP7 and H2020 projects. They support the scientific coordinators in a proactive, efficient and quality way, on financial, legal, administrative and organizational matters.

The **AMS Institute** is the joint initiative by TU Delft (TUD), Massachusetts Institute of Technology (MIT) and Wageningen University (WUR) in Amsterdam, the Netherlands, together with government, business partners and societal organizations. TU Delft has 50% say in the institute. AMS aims to become an internationally leading research institute where talent is educated and engineers, designers, digital engineers and natural/social scientist jointly develop and valorise interdisciplinary metropolitan solutions. In this role it endorses the REPAiR research.

Arjan van Timmeren (male) TUD Faculty of Architecture, Dep. of Urbanism, Chair Environmental Technology & Design (ETD). AT is supervising 12 PhD theses in the field of ETD. Has published 5 PRP, 110 articles, 5 books, 3 book chapters and realized many projects in practice. Reviewer for two international journals and several international conferences. AT is member of several (inter)national expert teams and committees (among others: Int. expert group on decentralized water systems) and responsible for several (inter)national research projects (NWO, EU FP7), conferences and academic and post-academic education programs. AT is involved in many academic projects with building industry, governmental and non-governmental organizations. Prof. van Timmeren will act as project leader and principle investigator of REPAIR.

Alexander Wandl (male) holds a master degree in landscape architecture and planning (BOKU Vienna) as well as a Post master's degree in Urbanism (EMU at TUD/IUAV). He is a researcher at the Department of Urbanism, Chair of Environmental Technology and Design with a rich experience in national (BAR, NWO) and international research projects (FP7: RUFUS, NODES; ESPON: TANGO). His expertise lies in the integration of spatial decision and design support via geographic information systems. His research specifically focuses on the integration of urban form, its performance and related spatial policies through the concept of Urban metabolism with a spatial focus on Peri-urban areas. He teaches spatial decision support systems to urbanism as well as geomatics students. AW will contribute specifically to the development of the GDSE tool as well as to making the concept of UM applicable to support the development of a more circular economy.

Hilde Remøy (female) has a PhD in Real Estate Management and is assistant professor at TUD Faculty of Architecture, Dep. of Management in the Built Environment (MBE). She has published more than 50 articles, 3 books, and 8 book chapters, and is a reviewer for 2 international journals and several international conferences. HR is a member of the editorial board of 1 international journal, and a board member of the European Real Estate Society (ERES). HR has a rich experience in research for national and local governments and research for the building industry. She teaches redesign of products and processes to postgraduate students at TUD and other institutes, and supervises thesis students. Her research and teaching focuses on adaptive reuse of areas and buildings, with specific focus on managing and reducing material use, related to adaptability and value development. HR will contribute specifically to the management of the PULLs and development of design for a more circular economy, and to the development of decision support models.

Marcin Dąbrowski (male) is a research fellow at the Chair of Spatial Planning and Strategy in the Department of Urbanism, Faculty of Architecture and the Built Environment at TUD. He holds a master degree in political science (Sciences Po Paris), while his PhD thesis (University of the West of Scotland) focused on regional development and stakeholder participation. In the past, he worked as a researcher at the University of Strathclyde and at the University of Vienna and, conducting research on regional and urban development policies in Europe, with a focus on governance issues. His current research focuses on climate change adaptation in urban regions (Urban Studies Foundation Postdoctoral Fellowship) and on social acceptance of renewable energy infrastructure (international project funded by The French National Research Agency). Beyond academia, he has repeatedly worked for the OECD contributing to research on multi-level governance and territorial administration. Within REPAIR MD will focus on knowledge transfer as well as research on behavioural and governance aspects of urban metabolism.

Bob Geldermans (male) is a researcher at the TUD, Department of Architectural Engineering + Technology, Chair of Climate Design & Sustainability. He holds a master's degree in Industrial Ecology. In his PhD research BG studies the potentially synergetic relation between resource cycles and sustainability in neighborhoods. His expertise particularly centers on circular economy concepts in building technology, architectural design and urbanism. BG is coordinator of the transdisciplinary Cradle to Cradle Lab at the TUD, and member of the Dutch Circular Economy Science Lab. He has worked on various national and international projects relevant to the REPAIR theme, such as Rotterdam Energy Approach and Planning + (REAP+, 2012) and Better Airport Regions (BAR, NWO, 2011-2014). Within REPAIR BG's specific focus will be on analyzing spatial layout, consumption patterns, waste flows and interlinks between them.

Loriane Icbaci (female) a PhD candidate in Sustainable urban Metabolism at TUD Faculty of Architecture, Dep. of Urbanism and TUD Faculty of Industrial Design, Dep. of Design Engineering. Her research focus is on building material waste prevention, concentrated in analyses of material content and the evolving dynamics regarding new construction and demolition in the housing stock in the Netherlands and its effects on resource consumption and waste production. Waste prevention policy and material accounting in the Netherlands has also been parallel concern of her research at TUDelft. She has worked as consultant in Haiti for Cordaid and lead study groups at TUDelft investigating waste material flows as secondary resources during reconstruction phase in Haiti, Indonesia, Bangladesh and the Phillipines. Besides has been co-author of conference articles and books. She completed Master in Japan in urban design and worked for architecture architectural firms. LI current

focus is to further investigate the knowledge of symbiotic relationships in material management (from waste to resource) and material consumption attributed to spatial design.

List of relevant publications:

Geldermans, RJ, Wandl, A, Dobbelsteen, AAJF van den (2014). Better airport regions: Schiphol., *S+RO (Stedenbouw en Ruimtelijke Ordening*, 95 (5), 26-29.

Wandl, A, Nadin, V, Zonneveld, WAM, Rooij, RM (2014). Beyond urban-rural classifications: Characterising and mapping territories-in-between across Europe., *Landscape and Urban Planning*, 130 (October), 50-63.

Timmeren, A van (2013). ReciproCities : a dynamic equilibrium. Delft: Delft University of Technology, Faculty of Architecture and the Built Environment.

Hara, Y, Hooimeijer, FL, Nijhuis, S, Ryu, M & Timmeren, A van (2014). The impact of historical geography and agricultural land development processes on wetland restoration methods used to create ecological networks : A comparison of Japan and the Netherlands. *Journal of Environmental Design and Planning* (Nakamura), 10, 127-138.

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Wilkinson, S.J., H. Remøy and C. Langston (2014) *Sustainable Building Adaptations*. Oxford, Wiley-Blackwell.

List of relevant previous projects:

SUME – Sustainable Urban Metabolism for Europe (2008-2011) Commissioning body: European Commission (EU 6th Framework)

ESPON TANGO - Territorial Approaches for New Governance (2011-2014) Commissioning body: ESPON.

BAR – Better Airport Regions (2012 -2014) Commissioning body: NWO (Urban Regions in the Delta).

REAP, REAP+ and REAP2 - The Rotterdam Energy Approach & Planning (REAP) (Tillie et al., 2009) method, developed for the Hart van Zuid area in Rotterdam, the Netherlands, is based on the premise that urban areas can be transformed into energy-neutrality by aligning local energy supply and demand patterns of different urban functions. The REAP2 (Dobbelsteen et al., 2011) and REAP+ (Geldermans et al., 2012) projects explored linkages with social dynamics on the one hand and materials, water and waste-flows on the other. REAP was commissioned by Rotterdam Climate Initiative, REAP2 by Programmabureau Stadshavens Rotterdam and REAP+ by Municipality Rotterdam (funded by programme Pieken in the Delta of the Ministry of Economic Affairs)

Participant 2 – Ghent University (UGhent)

Ghent University is one of the leading institutions of higher education and research in the Low Countries. Today Ghent University attracts over 41,000 students, with a foreign student population of about 4,000. In 2012, the university invested about 250 million Euros in research projects on behalf of public and private partners, and appointed about 5,500 scientific staff members. It now occupies the 85th position in the Times Higher Education World University Ranking.

The ENVOC research group is a part of the Department of Sustainable Organic Chemistry and Technology (Faculty of Bioscience engineering of Ghent University), and focuses its research, educational and service activities on clean technology and environmental sustainability, i.e. searching for preventive actions within production processes. For this purpose, Jo Dewulf and his team make analyses at the process, plant and overall industrial system level, based on process engineering and life cycle assessment with a specific focus on resource efficiency assessments. Apart from methodological improvements such as in the FP7 project PROSUITE (Prospective Sustainability Assessment of Technologies), implementations and collaborations with industrial partners have been put in practice, e.g. with Johnson&Johnson - Janssen Pharmaceutica, Taminco, Organic Waste Systems, Marine Harvest, Tate&Lyle, Indaver, Umicore, BASF, Solvay, Galloo and others. Also activities in this field with essenscia (federation of the Belgian chemical Industry) have been set up, funded by the Flemish IWT and by EU-EFRD. ENVOC is also partner of the Flemish Policy Research Center on Sustainable Materials Management to give sustainability

support to policy and is partner in the SPIRE project MEASURE to develop a roadmap for sustainability assessment methods for the European Commission and industry. The work of the ENVOC department is visible on the international scene, especially for its work on sustainability analysis at process, plant and cradle-to-gate level lead by Prof. Jo Dewulf, who obtained the prize of the laureate of the Royal Academy of Sciences and Arts of Belgium in 2008.

Ghent University has participated in more than 200 research projects in the EU's Sixth Framework Programme (2002-2006) and in 259 projects in the Seventh Framework Programme, of which 25 ERC grants and 25 Marie Curie Fellowships. Ghent University coordinated 42 collaborative projects in FP7. The University provides excellent training opportunities to both young and experienced researchers, and awarded around 640 PhD degrees in 2012 of which over 20% go to international young researchers. The university is one of the fastest growing European universities in terms of research capacity and productivity (e.g., in 2010 Ghent University researchers published about 4025 research papers in ISI-listed journals, a 200% increase in ten years' time), and its commitment to European research excellence is reflected by the recent extension of the 'European Office' in its Research Office, i.e. the department overseeing, steering and administering research projects. Research group EnVOC has been active in several European projects such as FP7 PROSUITE, EFRD Eco2chem, SPIRE - Measure and EU INTERREG Enalgae.

Key personnel being involved in REPAIR

Prof. Jo Dewulf (male) is leading together with Dr. Steven De Meester (male), the EnVOC research group in which currently about 15 researchers are working on resource efficiency and life cycle assessment. They have been active in several projects aimed at basic research on, and at the implementation in policy and industry of resource efficiency and sustainable development. They have a large network of industrial actors and was already involved in several regional and European projects. They collaborated amongst others on the business plan for sustainable chemistry in Flanders (FISCH), they were case study leader in the FP7 PROSUITE project, responsible for the EFRD project Eco2chem and have a leading role in the implementation of resource efficiency indicators in the Flemish sustainable material management (Summa).

Infrastructure

All required infrastructure (such as conference venues, meeting rooms, offices, etc.) and software (such as Simapro and OpenLCA) for the Repair project are available at Ghent University

Relevant Publications

Dewulf, J, Van Langenhove, H (2006) Renewables-based technology sustainability assessment. Wiley Series in renewable resources, Chichester: John Wiley & Sons. 384p.

Dewulf, J, Bösch, ME, De Meester, B, Van Der Vorst, G, Van Langenhove, H, Hellweg, S, Huijbregts, MAJ (2007) Cumulative Exergy Extraction from the Natural Environment (CEENE): a comprehensive Life Cycle Impact Assessment method for resource accounting. Environmental Science and Technology 41, 8477-8483.

Dewulf, J., Van Langenhove, H., Muys, B., Bruers, S., Bakshi, B.R., Grubb, G.F., Paulus, D.M., Sciubba, E. (2008) Exergy: its potential and limitations in Environmental Science and Technology. Environmental Science and Technology 42, 2221-2232.

Alvarenga, RAF, Dewulf, J, De Meester, S, Wathélet, A, Villers, J, Thommeret, R, Hruska, Z (2013) Life cycle assessment of bioethanol-based PVC, part 1: attributional approach. Biofuels, Bioproducts and Biorefining 7, 386-395. + part 2: consequential approach. Biofuels, Bioproducts and Biorefining 7, 396-405

Swart, P, Dewulf, J (2013) Quantifying the impacts of primary metal resource use in life cycle assessment based on recent mining data. Resources, Conservation and Recycling 73, 180-187.

Associated with document Ref. Ares(2016)1693984 - 11/04/2016

Prosuite FP7: Prospective sustainability assessment and technologies, 4 years (2009-2013)

Summa: Sustainable Materials Management, 4 years (2012-2016), Flemish government

Measure: Metrics for Sustainability Assessment in European Process Industries, 2015-2016, Horizon 2020

Man-nature relationships in environmental sustainability assessment of forest-based production systems, 2011-2015, FWO-Flanders

Development of a tool for the environmental evaluation of the resource and energy consumption in the pharmaceutical industry at the process, plant and system level, 2006-2010, IWT-Flanders

Participant 3: DIARC UNINA - University of Naples Federico II (UNINA)

The University of Naples Federico II was established in 1224 through an Imperial Charter of Frederick II Hohenstaufen, King of Sicily and Holy Roman Emperor. It was the first publicly funded university in Europe. Nowadays the university offers courses in essentially all academic disciplines, leading to one hundred fiftyfive graduate level degrees. Research facilities provide support to all these courses. Students are given the opportunity to pursue intellectual development as well as the acquisition of professional skills. Current student enrollment nears 86,000 and the academic personnel, at this time, is 2532.

The university is made up of three Schools - the Polytechnical and Basic Sciences School, the School of Medicine and the School of Human and Social Sciences - and 26 Departments which operate as semi-independent bodies for the teaching and research management being anyway part of a School. The University Federico II has a tradition of promoting and supporting student associations. There are more than fifty student associations currently active, which bring together students, of widely varied cultural and social background. These associations give rise to initiatives and activities of different nature, including sporting events, arts, social and political forums. The University Federico II is striving to become a world university and, to this end, places the highest priority in nurturing relationships, both within Italy and internationally. Our students are relentlessly encouraged in the pursuit of excellence, at home and abroad. Our staff and students take part in a variety of exchange programmes, within Europe, the Americas and Asia. Cognizant of the changing needs of education and research, the Federico II University of Naples is making every effort to raise its international standings and to become more attractive for international students. Its educational network is being geared towards the establishment of life-long, high level professional training programmes, while maintaining excellence in all fields of education and research.

Within REPAiR the Department of Architecture is involved with the main responsibilities to coordinate the Peri-Urban Labs across the 6 case studies and to develop the WP5.

The Department of Architecture - DiARC was born on a strong tradition of architectural and urban planning research and learning, preserving the integration among fields of knowledge: architecture, drawing, history, urban planning, engineering and technologies, mathematics, etc. DiARC has articulated post-graduate opportunities: PhD, Master Programmes, the Cultural Heritage and Landscape Specialization School, etc. It developed, by years, several international relationships, through a specific tool, the Internationalization Office, aimed to compete in the preparation of research proposals and courses, in order to improve trans-national partnerships. It created research agreements with other cultural institutions (e.g. bilateral agreements with other countries, the participation to European Framework Program FP7-ICT in partnership with international public bodies). The international perspective is a consolidated framework for the proposed research, guaranteeing cooperation among researchers during the program.

Currently an interesting research for the DiARC is the PRIN "RE-CYCLE Italy. New Life Cycles for Architecture and Infrastructure of City and Landscape". Its topic is perfectly in accordance with the objectives of the proposal: they both refer to Horizon 2020 aims, in conformity with the indications from the European Landscape Convention. The PRIN research unit of Naples focuses on the pair *drosscape/recycle*, thus constituting an important local reference for the proposed research program. In addition, the connection with the other Italian units of the PRIN, is a starting point to investigate the question of waste cycle and illegal practices, through common workshops and seminars. The Department has also created various third party agreements with public entities and SMEs. This guarantees to the proposed research unit, an easy access to local and specific testing grounds.

The Department has classrooms, workrooms and study halls, a computerized departmental centre (CeDIPAT), three libraries, in addition to administrative offices and assembly rooms.

Michelangelo Russo (Team leader) (male) is full Professor of Urban Planning and is the head of the Laboratory of Urban Design at the Department of Architecture, University of Naples Federico II, where he is currently the Coordinator of the PhD

Program in Architecture. He was a member of several national and international research groups, currently in the unit of Naples Programma Prin 2012 "Re-cycle Italy. Nuovi cicli di vita per architetture e infrastrutture di città e paesaggio" and Programma Faro "Cilento Labscape". He is the president of the national executive of the SIU - Società Italiana degli Urbanisti, and in 2013 he was in the scientific coordination of the XVI Conferenza Nazionale Siu, "Urbanistica per una diversa crescita". His research deals with the themes, the knowledge and the phenomena of contemporary urban design in relation to the mutations of the city, urbanized areas, landscapes, interaction space / country.

Libera Amenta (female) holds a Master Degree (cum laude) in Architecture (DIARC-UNINA) and a Ph.D. in Urban Design and Planning (DIARC-UNINA and PhD Guest at TUD 1 year) about the recycling of Wasted Landscapes as a resource for contemporary cities. Nowadays she is Guest Researcher at TU Delft where she is carrying out studies about the regeneration of Wasted Landscapes through a metabolism approach and towards circular economies. Since the graduation, she was a member of several research groups, currently she is researcher in the unit of Naples Programma Prin 2012 "Re-cycle Italy. Nuovi cicli di vita per architetture e infrastrutture di città e paesaggio" about finding new life-cycles for 'drosscapes' in the metropolitan area of Naples, with a specific focus on Peri-Urban areas. At DIARC, she is also involved in the City Plan for Casaluce (CE - Italy) in which she contributes in developing strategies for the regeneration of degraded Peri-urban areas. Within Repair Libera Amenta will coordinate the Peri-Urban Lab of Naples and co-coordinate the other Peri-Urban Labs. She will be the expert about the topic "Wasted Landscapes".

Annie Attademo (female) is a Senior Architect and holds a PhD in Urban and Spatial Planning. She did part of her studies in the UK (Department of Civic Design of Liverpool, School of Architecture and Built Environment of London), focusing on urban regeneration and contemporary wastelands and drosscapes. Starting from the recycle project for London 2012 Olympic Park, she has worked through published articles and papers, on the extension of her PhD research, analyzing the interaction between land consumption, recycle, landscape interpreted as a place for uncommon integrations. She developed a project of creative recycle for the countryside between the towns of Naples and Caserta, awarded at the national competition organized in 2011 by Agrorinasce and at a national competition organized in 2013 by Campania Region. The core of the transformation was the recovery of dumping grounds, all along the cultivated countryside, turning the current 'Terra dei Fuochi' into the ancient 'Campania Felix'. She worked for public sector and agencies as a facilitator of projects, involving local communities and stakeholders. Building on these experiences, she will help coordinating the Peri-Urban Lab of Naples and co-coordinate the other Peri-Urban Labs, as an expert in participatory planning and urban re-design of fragile territories.

Both Dr. Amenta and Dr. Attademo are going to have an employment contract with UNINA from the beginning of the project on.

List of relevant publications:

RUSO M., Città-Mosaico. Il progetto contemporaneo oltre la settorialità, Clean Edizioni, Naples, 2011

Russo M., Formato E., (2014). Re-Use/Re-Cycle Territories: A Retroactive Conceptualisation for East Naples, TeMA Journal of Land Use, Mobility and Environment, INPUT 2014, Eighth International Conference INPUT - Naples, 4-6 June 2014 Smart City - Planning for Energy, Transportation and Sustainability of the Urban System, ISSN 1970-9889, e- ISSN 1970-9870, p.431-440 (Working Team: AMENTA L., ATTADEMO A., Castiello S., Di Marco C., Prisco M.).

RUSO M., "R.E.D.S. Rome Ecological Design Symposium", Journal of Landscape Architecture, 1-2014 (88-89), 2014;

AMENTA L., Castiello S., Di Marco C., Formato E. (2014), Napoli est. Naturartificiale, verso nuovi metabolismi ibridi, Il territorio degli scarti e dei rifiuti, a cura di Carlo Gasparrini, Rosario Antonio Pavia, Roberto Secchi, Aracne, pagine 163-169.

ATTADEMO A., "Riciclare i margini della città contemporanea. Il caso studio di Hackney Wick e Fish Islands", Atti della XVI Conferenza Nazionale Società Italiana degli Urbanisti, Urbanistica per una diversa crescita, Napoli, 9-10 maggio 2013, Planum. The Journal of Urbanism, no. 27, vol.2, 2013.

2002 La explosión de la ciudad (local coord. Attilio Belli, Michelangelo Russo, international coord. Antonio Font, University of Catalunya), Transformaciones territoriales recientes en las regiones urbanas de la Europa Meridional

PRIN 2005 (local coord. C. Gasparrini, national coord. P. Di Biagi, University of Trieste), The "public city" as a design laboratory. The production of Guidelines for the sustainable renewal of urban suburbs, The case of the metropolitan periphery of Naples

FARO 2010 Programme - (coord. M. F. Palestino), Urban open spaces resilient to storm-water system in climate change

FARO 2011 Programme - (coord. M. Cerreta), Cilento Labscape, A Living Lab in the national park of Cilento e Vallo di Diano

PRIN 2012 – (local coord. C. Gasparrini, national coord. A. Bocchi, University of Venice), RE-CYCLE. New life cycles for buildings and infrastructure of the city and landscape, Re-landscaping crosscapes in Campania Region

Participant 1: HafenCity University (HCU) - Institute of Urban Planning and Regional Development

HafenCity University Hamburg - University of the Built Environment and Metropolitan Development is the only Europe-wide University which is solely focused on architecture and metropolitan development. For this reason, the entire range of disciplines of HCU is oriented towards understanding and designing the urban environment:

The **Institute of Urban Planning and Regional Development** at HCU promotes innovative, interdisciplinary and internationally oriented studies and research. Both the institute's research and study courses are dedicated to finding innovative solutions for the main challenges facing urban and regional development such as climate change, competitiveness, cohesion, integration and resource scarcity with a focus in two main areas:

Metropolises and regions: The institute conducts research related to the identification of new approaches for improved competitiveness and balanced territorial development of metropolitan areas. It elaborates visions for metropolitan regions studying the potentials of urban-rural cooperation, identifying perspectives for suburban development and testing ways to address the challenges of socio-economic, administrative and morphological fragmentation. Furthermore, research is dedicated to analysing different forms of large-scale partnerships and their contribution to territorial cohesion in Europe. Particular attention is paid to investigating new forms of territorial governance, the emergence of soft spaces and the manifestation of these in different planning contexts. Comparative planning studies about the different planning systems and traditions as well as the broader cultural context of spatial planning and development round the profile of the Department.

Sustainable development: The institute's main research interest lies in the area of climate change adaptation and mitigation, environmental protection and energy transition. The research is primarily focused on policy and stakeholder analysis, land use planning, evaluation and application of planning instruments, development and testing of innovative methods and tools to support policy and planning, to avoid land use conflicts and to promote utilization of renewable energies.

A defining characteristic of the institute is the multidisciplinary approach and the combination of expertise from the planning domain with knowledge from the fields of geography, policy and sociology.

Participant 2: Chair of Urban Planning and Regional Development at HCU

Jörg Knieling holds the Chair of Urban Planning and Regional Development at HCU and is dean of the urban planning program at HCU. From 2006 to 2012 he was HCU's vice-president for research affairs.

He graduated in urban, regional and environmental planning, holds a master's degree in political sciences and sociology and a Ph.D. from the University of Hanover. He is member of the German Academy for Spatial Research and Planning (ARL), of the advisory board for spatial development of the German Ministry of Transport and digital Infrastructure, and of the World Future Council's expert commission on Cities and Climate Change. In 2008/09 he was 'Directeur d'Etudes Associé' of the Institute of Advanced Studies (IEA) in Paris.

His main research fields are sustainable urban and regional development, spatial development and climate change, and related aspects of territorial governance and planning theory. He has conducted several international and national research projects in recent years, current publications have been on Soft Spaces in Europe (2015), Climate Adaptation Governance (2013), and Planning Cultures in Europe (2009). He has been referee for European Commission (DG Research), the European Institute of Technology (EIT), and a number of national research councils.

Andreas Obersteg graduated in economic and social geography with minor subjects in spatial planning, regional development and business administration at Technical University Munich and University Tours (France). He worked in a consultancy and planning office and in research institutions in Vienna, Munich and Hamburg (ISR, TUM, LMU and TUHH). Currently he is a research associate at HafenCity University Hamburg, where his research is comprised of several projects on city-regional development and governance and on urban-rural partnerships (INTERREG projects SURF, NEW BRIDGES, URMA).

List of selected publications

Knieling, J.; Jacuniak-Suda, M.; Obersteg, A.: Urban-rural partnerships and governance of peri-urban areas in European perspective. In: Colucci, A.; Magoni, M.; Menoni, S. (eds.) (2015): Peri-urban areas and Food-Energy-Water Nexus. Sustainability and Resilience Strategies in the Age of Climate Change, N.P., Springer. Forthcoming.

Allmendinger, P.; Haughton, G.; Knieling, J.; Othengrafen, F. (eds.) (2015): Soft Spaces in Europe. Re-negotiating governance, boundaries and borders, Series Regions and Cities, London: Routledge. 248 p.

Termeer, C.; Buuren, A.v.; Knieling, J.; Gottschick, M. (2015): Reconciling collaborative action research with existing institutions: insights from Dutch and German climate knowledge programmes, Journal of Water and Climate Change, Vol. 6, No 1, pp. 89-103.

Knieling, J.; Müller, B. (eds.) (2015): Klimaanpassung in der Stadt- und Regionalentwicklung, Ansätze, Instrumente, Maßnahmen und Beispiele, Reihe Klimawandel in Regionen zukunftsfähig gestalten, Vol. 7, München: oekom-Verlag.

Jacuniak-Suda, M., Knieling, J., Obersteg, A.: Urban-rural partnerships as a tool of territorial cohesion. A conceptual approach derived from INTERREG IV C URMA "Urban-Rural Partnerships in Metropolitan Areas". In: Dej, M.; Janas, K.; Wolski, O. (eds.) (2014): Towards Urban-Rural Partnerships in Poland. Preconditions and Potential. pp. 15-31. Krakow

List of relevant Projects

URMA Urban-rural partnerships in metropolitan areas. Interreg IVC (2012-2014)

KLIMZUG-NORD Regional strategies concerning climate changes in the metropolitan area of Hamburg. German Federal Ministry of Education and Research (BMBF Bundesministerium für Bildung und Forschung). (2009-2014)

CLUE Climate Neutral Urban Districts in Europe. Interreg IVC (2012-2014)

SURF Sustainable Urban Fringes. Interreg IVB North Sea Programme. (2010-2013)

Commission of Cities and Climate Change. Cooperation with the World Future Council (2008-2012)

Publications in international journals, books, etc.

The Centre for Economic and Regional Studies consists of the Institute for Regional Studies (IRS), the Institute of Economics and the Institute of World Economics. CERS is an independent research institute belonging to the Hungarian Academy of Sciences. The IRS is a network of several departments in the country having opportunity for empirical researches on the spot. The mission of the IRS is conducting basic theoretical and empirical researches in regional science. The Institute supports also regional policy decisions at local, regional, and national levels by its applied researches. The Institute's scientific results contributed the formulation of the European Union's cohesion strategy in ECC countries.

The researchers of the IRS are participating in teaching master and doctoral programmes on regional science at different universities. Serving as the forum for the dissemination of regional development innovations, it maintains some scientific periodicals: Space and Society scientific journal, Discussion Papers series in English language, the Great Plain Studies yearbook, Studia Regionum (Regional and urban research), "Regions of the Carpathian Basin" and "Europe of the Regions" series.

More information can be found: www.rkk.hu

Key personnel being involved in REPAiR

VARJÚ, Viktor (Team leader) (male) (PhD – Earth sciences) research fellow, dealing with environmental policy in general in Europe and Hungary, environmental policy integration into planning and development procedures and analysis of social and geographical aspects of renewable energy use. Experiences related to the proposal: 1) Project leader of the Hungarian team in the 'REGPHOSYS – Regional Actuators of Photovoltaic Systems' international IPA project; 2) participant member in 'Governance for Sustainability' (FP6) project responsible for the elaboration and analysis of the Hungarian case; 3) participant member in 'Ex-post Evaluation of the Cohesion Fund (including former ISPA) – Work Package D: Management and Implementation, responsible for the Hungarian country report.

BODOR, Ákos (male) (PhD – political science) research fellow, dealing with the role and importance of social norms, values, attitudes, and rules as contextual elements for public policy implementation. Experiences related to the proposal: 1) participant member in a FP7 project 'Bordering, Political Landscapes and Social Arenas' (EUBorderScapes) responsible for tasks on Europeanization and the role of formal and informal institutions; 2) participant member in one ongoing and two finalized OTKA researches focusing on interplays between socio-cultural context and (a) decentralization; (b) innovation policy; and (c) agglomeration policy.

GRÜNHUT, Zoltán (male) (PhD – political science) research fellow, dealing with social capital, the issue of trust and interplays between socio-cultural specificities and public policy efficiency especially in East Europe and Israel. Experiences related to the proposal: 1) participant member in an ESPON research project called 'Territorial Approaches for New Governance' (TANGO); 2) participant member in a FP7 project 'Bordering, Political Landscapes and Social Arenas' (EUBorderScapes) responsible for tasks on Europeanization and the role of formal and informal institutions.

PÁLNÉ KOVÁCS, Ilona (female) (PhD, DSc), director of Centre for Economic and Regional Studies of Hungarian Academy of Science, and full time professor at the Department for Political Science and International Studies of University of Pécs. She is graduated as a lawyer (1978), PhD (1988), doctor of Hungarian Academy of Sciences (2000), habilitation (University of Pécs, 2003). She was elected as a corresponding member of Hungarian Academy of Sciences in 2013. She deals with the management of regional policy, regional governance and local governments, leader of doctoral programme for political studies at University of Pécs.

SUVÁK, Andrea (female) junior research fellow. Her main field of interest is environmental ethics and its implications on environmentally sustainable spatial development, along with issues concerning local economic development and short food supply chains. Experience related to the proposal: participant in a row of projects dealing local waste management issues, modelling of micro-regional energy and material flow; participant in IPA REGPHOSYS project modelling solar energy production and consumption on regional field.

Judit Tímár (female) is a senior research fellow at MTA KRTK, Institute for Regional Studies, Békéscsaba Department. She holds master degrees on mathematics and geography and PhD equivalent CSc in Geography. Her main research field is production of geographical thoughts, critical geography and feminist geography. She wrote several articles in the topic of Gender geography of post-socialist urban and rural spaces and places. She was and is member of several international journal and editorial or editorial advisory boards (e.g. European Urban and Regional Studies, International E-Journal for Critical Geographies, Gender, Place & Culture: A Journal of Feminist Geography). She was a full member of the Gender and Geography Committee of the International Geographical Union and the member of the Steering Committee of the International Group of Critical Geographers. She was also a board member of the Foundation for the Women of Hungary/MONA. She has led and worked on various national and international projects (e.g. RegPol² – Marie Curie Action, ESPON SEMIGRA) not only relevant to REPAiR theme but on gender topic as well.

Project Manager, Administrator

SÜLE, Katalin (Project Manager, Administrator) (female) (dr). jurist, linguist, cultural and science manager, has a 23 years of experience in managing and administering international research projects, including Tempus, FP5, FP6, FP7, INTERREG, ESPON, IPA, etc.

List of relevant publications:

Pelin, D., Šljivac, D., Topić, D., Varjú, V. (szerk.) 2014: Regional impacts of different photovoltaic systems = Utjecaj fotonaponskih sustava na regiju = Különböző fotovillamos rendszerek regionális hatásai. Pécs: IDResearch Kft. - Publikon, 302p.

Varjú, V., Suvák, A., Dombi P.: Geographic information systems in the service of alternative tourism – methods with landscape evaluation and target group preference weighting. *INTERNATIONAL JOURNAL OF TOURISM RESEARCH* 16:(5) pp. 496-512. (2014).

Pálné Kovács, I. (2015): Regional elites, networks and the beauty of regionalism in Hungary. In: Buček J, Ryder A (eds.) *Governance in Transition*. 270 p. Dordrecht: Springer Netherlands, 2015. pp. 109-131.

Pálné Kovács, I., Kutsar D (eds.) (2010): *Internationalisation of Social Sciences in Central and Eastern Europe: The „Catching Up” – a Myth or a Strategy?* London; New York: Routledge, 2010. 234 p.

Bodor, Á., Grünhut, Z: Theoretical Comments on the Concept of Territorial Capital
In: Bodor, Á, Grünhut, Z (eds.) *Cohesion and Development Policy in Europe*. 131 p.
Budapest; Pécs: Institute for Regional Studies, Centre for Economic and Regional Studies, Hungarian Academy of Sciences, 2015. pp. 119-131.

Timár J, Velkey G (2016): The relevance of the political economic approach: The interpretations of the rural in the migration decision of young women and men in an economically backward region. *Journal of Rural Studies*, 43: 311-322, doi:10.1016/j.jrurstud.2015.11.012

Timár J, Fabula Sz. (2013): Whose identity politics? – Lessons for emerging critical disability geography in Hungary *Geographica Helvetica* 68:(3) pp. 171-179. doi:10.5194/gh-68-171-2013

Timár, J., G. Fekete, É. (2010): Fighting for Recognition: Feminist geography in East-Central Europe. *Gender Place and Culture, The Journal of Feminist Geography*. 17(6): 775–790.

List of relevant Projects:

Local Dimensions of a Wider European Neighbourhood: Developing Political Community through Practices and Discourses of Cross-Border Co-operation: EUDIMENSIONS (2006-2008) Commissioning body: European Commission (EU 6th Framework).

Governance for Sustainability: G-FORS (EU 6.FP) (2006-2008) Commissioning body: European Commission (EU 6th Framework).

ET 2050 - Territorial Scenarios and Visions for Europe Luxembourg: ESPON (European Spatial Planning Observation Network), (2011-2015) Commissioning body: ESPON.

Bordering, Political Landscapes and Social Arenas: Potentials and Challenges of Evolving Border Concepts in a post-Cold War World. European Union 7th Framework Programme, (2012-2016) Brussels.

ESPON TANGO - Territorial Approaches for New Governance (2011-2014) Commissioning body: ESPON.

Pol. Instytut Geografii i Organizacji Przestrzeni Polskiej Akademii Nauk

Stanisław Leszczycki Institute of Geography and Spatial Organization Polish Academy of Sciences (*Instytut Geografii i Przestrzennego Zagospodarowania Polskiej Akademii Nauk*) was founded in 1953 (initially as the Institute of Geography PAS). The Institute is a leading research centre in Poland in the fields of socio-economic geography, physical geography as well as land use, spatial planning and organization. The rich collection of books, serial publications, scientific journals and electronic

resources is gathered and regularly updated by the Central Library of Geography and Environmental Protection (one of the IGiPZ's units), being one of the largest geographical sciences libraries in the world.

The IGiPZ PAN's special asset is an active involvement in international scientific collaboration that, in recent years, have resulted in participation in more than 100 scientific projects and applied research. In addition, in the last decade there have been ca. 300 national research and applied studies, expert evaluations, etc., carried out by the IGiPZ PAN. Our staff's annual publishing output comes to a total of 400 published items (e.g. peer-reviewed articles, monographs, notes, etc.), including our own journals and publication series.

The IGiPZ PAN's tasks include, in particular:

- carrying out research studies in the field of: physical geography (geomorphology, the Quaternary paleogeography, hydrology, climatology, geoecology and environmental protection), socio-economic geography (urban and population geography, geography of agriculture and rural areas, geography of industry, transport and services), political geography, cartography, spatial organization, local and regional development,
- training of scientific staff and researchers as well as specialists with high qualifications in geographical sciences and spatial analyses,
- supporting young researchers and early career scholars,
- dissemination of the findings of studies among governmental institutions and local authorities in order to apply theoretical knowledge in practice for the benefit of the economic, social and spatial development,
- promotion of an international scientific cooperation through bilateral and international research projects and participation in scientific consortia,
- dissemination of the knowledge gained in a wide range of scientific activities undertaken in the IGiPZ PAN,
- publishing activities.

Key personnel being involved in REPAIR

Dr. Konrad Czapiewski (male) currently works for the Institute of Geography and Spatial Organisation, Polish Academy of Sciences. Konrad's research interests are in areas of rural geography – successful rural areas, rural development, functions of rural areas, local development – and human geography – education, human capital, intraregional differences, knowledge transfer and endogenous growth. Konrad has held a number of scientific posts, including on the board of the Polish Geographical Society, the Scientific Council of the Institute of Geography and Spatial Organization, member of the Main Board of Commission on Rural Areas of Polish Geographical Society, an associate member of the Local and regional Development Commission IGU and the Task Force for Development of Rural Areas Committee for Spatial Economy and Regional Planning. He is an Editor-in-Chief of journal "Studia Obszarów Wiejskich / Rural Studies". He has authored more than sixty scientific publications in areas of rurality, locality, regional periphery and spatial analysis and participated in ca. 40 international and domestic research and application projects including among others scientific projects for Polish National Centre of Science, ESPON Projects, other international projects and applied projects for Ministry of Agriculture and Rural Development, Ministry of Infrastructure and Development and Regional and Local Self-Governments.

Prof. Jerzy Bański (male) is a full professor of human geography in the Institute of Geography and Spatial Organization, Polish Academy of Sciences (IGSO PAS) and a professor of Maria Curie-Skłodowska University in Lublin, Poland. He earned his Ph.D in 1996 and habilitation in 1999. His main research interests include: rural and agricultural geography, land use, regional policy, spatial organization and local development. From 2008 is the head of Department of Rural Geography and Local Development at the IGSO PAS and in the period 2006-2012 was the President of the Polish Geographical Society. Jerzy Bański is author of 320 publications, including 20 books and more than 150 papers with review processes. He was co-ordinator of 35 research projects and the member of 30 other projects.

Prof. Marcin Wójcik (male) is researcher and teacher at the University of Łódź (Poland). Graduated geography in 2002, specialising in human and regional geography. PhD thesis (2006) entitled "Social and economic transformations in suburban villages in the Łódź metropolitan area" concerned the impact of the big city (Łódź) on the transformations of rural structures in a time of rapid transformation during the post-socialist transition (1990-2004). His research interests are focused on the social and cultural dimension of transformations in Polish rural areas, the problems of history of Polish human and social geography. His scientific output includes approx. 100 works such as books, collections of articles he edited, maps and high

school textbooks. Since 2013, he has been the chairman of the Rural Study Group at the Polish Geographical Society, as well as a member of The Task Force for Development of Rural Areas at the Committee for Spatial Economy and Regional Planning (Polish Academy of Sciences). Winner of the awards of the Rector of the University of Łódź, the Mayor of Łódź and the Foundation of the University of Łódź.

Dr. Magdalena Górczyńska (female) is a researcher at the Institute of Geography and Spatial Organization, Polish Academy of Sciences and currently conducts the study on segregation and social mix policy in France as an invited research fellow in the CNRS in Paris (laboratory Géographie-Cités). Her research interests cover the comparison of socio-spatial changes in the Western and Central European metropolitan areas (social segregation, exclusion, gentrification), including analysis of local urban policies (mainly housing policy and urban renewal) as drivers of these evolutions. Her researches conducted both in Warsaw and in Paris were supported by Polish National Science Centre, Polish Ministry of Science and Higher Education and French Embassy in Poland. She published her findings in English, French and Polish peer-reviewed journals and books and won several awards from the Mazovia Voivodeship (Poland) as well as from the University of Paris 1 and Foundation for Social Sciences in France. In addition, she participated in several ESPON and INTERREG projects as well as in applied studies financed by the Polish Ministry of Infrastructure and Development.

Professor Wójcik is going to have an employment contract with IGiPZ during the project duration.

Relevant publications:

Bański J., Wesolowska M., 2012, Architectural Transformations of Residential Buildings in Rural Areas of the Lublin Region, *Architectoni.ca*, 2, 174-186.

Bański J., 2011, Changes in agricultural land ownership in Poland in the period of the market economy, *Agricultural Economics*, 57, 2, 93-101.

Czapiewski K., Wójcik M., 2014, Towards a post-structuralist and cultural turn in researching rurality in Poland: a geographical perspective. (in): *Rural cooperation in Europe. In search of the 'relational rurals'*. Ed. Edward Kasabov. Houndmills: Palgrave Macmillan, 231-265.

Czapiewski K., 2012, Intraregional peripheries of economic development - a case study of Mazovia Region in Poland, *Studia Obszarów Wiejskich*, 27, 33-45.

Górczyńska M., 2014, Unique or universal? Mechanisms and processes of social change in post-socialist Warsaw. - *Hungarian Geographical Bulletin* 2014, 63, 3, 255-277.

Górczyńska M., Ferenc M., Konopski M., Essig S., Kaucic J., Schuh B., Lange Scherbenske S., Dymen C., 2014, Accessible ESPON knowledge and its application in local and regional context. - *EUROPA XXI*, 25, 51-68.

Wójcik M., 2014, Territorial identity of countryside residents in the suburban areas of Łódź, Poland, *Quaestiones Geographicae* 32 (2), 69-79.

Relevant Projects:

European Land Use Patterns (EU-LUPA) – ESPON 2013
Detecting Territorial Potentials and Challenges (DeTeC) – ESPON 2013

Indicators and Perspectives for Services of General Interests in Territorial Cohesion and Development (SeGI) - ESPON 2013
Best Development Conditions in European Metropolises: Paris, Berlin and Warsaw (Best Metropolises) - ESPON 2013
Peri-urban Land Use Relationships - Strategies and Sustainability Assessments Tools for Urban-Rural Linkages (PLUREL) – FP6

The Joint Research Centre (JRC) is the European Commission's in-house science service which employs scientists to carry out research in order to provide independent scientific advice and support to EU policy. The mission of the JRC's Institute for Environment and Sustainability (JRC-IES) is to provide scientific and technical support to EU policies for the protection of the environment, and the more efficient and sustainable management of natural resources at global and continental scales. IES carries out research to understand, monitor and anticipate the complex interactions between human activity and the natural environment, in order to support the development and implementation of policies that protect the global environment and ensure that strategic resources (water, land, forests, food, minerals) are managed in a more sustainable manner for the benefit of present and future generations. The following experts from the Sustainability Assessment Unit of the JRC-IES will be involved in the supervision of the work under REPAIR:

Key personnel being involved in REPAIR

Simone Manfredi holds a Master Degree in Environmental engineering and a PhD in environmental assessment of waste management systems. He is author / co-author of about 20 papers in peer-reviewed scientific journals. His expertise includes analysis and environmental assessment of waste management systems and technologies, life cycle assessment, development of environmental indicators, and environmental footprinting of products and organisations. He will act as the JRC-IES contact person for REPAIR and provide his contribution to REPAIR mainly with respect to the foreseen environmental and sustainability assessment work.

Fabrice Mathieux holds a Master Degree in Mechanical engineering and another in Solid waste Management Life Cycle Analysis and a PhD in Industrial Engineering on design for recycling of electr(on)ic Equipment. He is author / co-author of more than 20 papers in peer-reviewed scientific journals. His current activities concern the development of policy relevant methods (and underlying data) to assess environmental performances of products and systems, in particular in the context of the Circular Economy. He has recurrent contacts with several policy DGs (including DG ENV, DG GROW and DG ENER). Moreover, the recruitment of a dedicated research staff (i.e. post-doctoral fellow type) to carry out the work is planned.

List of relevant publications:

- EC - European Commission (2010c) - JRC (Joint Research Centre) - Institute for Environment and Sustainability (IES): International Reference Life Cycle Data System (ILCD) Handbook – General guide for Life Cycle Assessment – Detailed guidance, First edition March 2010, EUR 24708 EN, Luxembourg, Publications Office of the European Union. Available online at <http://lct.jrc.ec.europa.eu/assessment/projects>
- EC – European Commission (2012c): Life cycle indicators for waste management: development of life cycle based macro-level monitoring indicators for resources, products and waste for the eu-27. European Commission, Joint Research Centre, Institute for Environment and Sustainability. Available online at <http://lct.jrc.ec.europa.eu/assessment/publications>
- EC - European Commission (2011b): Supporting environmentally sound decisions for waste management - Technical guidelines (3 reports). Available online at http://sa.jrc.ec.europa.eu/?page_id=777
- Manfredi, S., Allacker, K., Pelletier, N., Schau, E., Pant, R., Chomkhamisri, K., and Pennington, D. (2015): Comparing the European Commission product environmental footprint method with other environmental accounting methods. *The International Journal of Life Cycle Assessment* 20, 389-404
- Allacker K., Mathieux F., Manfredi S., Pelletier N., de Camillis C., Ardente F., and Pant R. (2014): Allocation solutions for secondary material production and end of life recovery: proposals for policy initiatives. *Resources, Conservation & Recycling*, 88, 1-12
- Manfredi, S., Goralczyk, M. (2013): Life cycle indicators for monitoring the environmental performance of European waste management. *Resources, Conservation & Recycling* 81, 8-16.
- Manfredi, S., Pant, R., Pennington, D. & Versmann, A. (2011): Supporting environmentally sound decisions for waste management with LCT & LCA. *The International Journal of Life Cycle Assessment* 16(9), 937-939
- Huysman, S., Sala, S., Mancini, L., Ardente, F., Alvarenga, R.A.F., De Meester, S., Mathieux, F., Dewulf, J. Toward a systematized framework for resource efficiency indicators. *Resources, Conservation and Recycling* 95 (2015) 68–76.
- Fulvio Ardente, Maria Calero Pastor, Fabrice Mathieux, Laura Talens Peiró. Analysis of end-of-life treatments of commercial refrigerating appliances: Bridging product and waste policies. *Resources, Conservation and Recycling* 101 (2015) 42–52.

Harvesting solar energy with multifunctional glass-polymer Windows: HarWin (2012-2015). Commissioning body: European Commission (EU 7th Framework Programme).

Recovered Fuels combined with Biomass: RECOMBIO (2010-2013). Commissioning body: European Commission (EU 7th Framework Programme).

Environmental Footprint and Material Efficiency: EFME (2012-2015). Commissioning body: European Commission (Contract with DG ENVIRONMENT).

Support to selection methods for critical raw materials (2015-2016). Commissioning body: European Commission (Contract with DG GROW).

Geographic Information Systems Regional layers (2012-2015). Commissioning body: European Commission (Contract with DG REGIO).

Participant 8 - Geo-Col GIS and Collaborative Planning (Geo-Col)

Geo-Col specializes in researching, developing, testing, and implementing GIS-based spatial decision support systems (SDSS) and planning support systems (PSS) that are used in collaborative workshop-based settings for Geodesign, participatory planning and sustainable development. These GIS solutions are typically used in combination with interactive hardware instruments, such as the MapTable. In particular, with many years of successful project experience, Geo-Col has grown as a certified consultant with proven in-depth knowledge and training capabilities regarding the ArcGIS-based CommunityViz software and applications.

Key personnel being involved in REPAIR

Gustavo Arciniegas (male) is the owner and lead consultant at Geo-Col. He received in 2012 a Ph.D. in 'Map-based decision support tools for collaborative land use planning' from IVM, VU University Amsterdam, the Netherlands. He also holds an M.Sc. degree in Geoinformatics from the University of Twente, ITC faculty, the Netherlands, (2005) and a B.Sc. degree in civil engineering from the UIS, Colombia (2000). He specializes in the integration of GIS, SDSS, PSS and geo-instruments for collaborative spatial decision-making and geodesign, focusing on sustainable and environmental planning. Gustavo is a certified CommunityViz authorized GOLD consultant. His profile can be summarized as:

- Advisor on the use of GIS and Spatial Decision Support Systems for multidisciplinary collaborative and sustainable planning
- Experienced in training and capacity building about GIS, PSS and SDSS
- GIS expert and environmental scientist with strong analytical and statistical skills
- Experienced in setting up geospatial data models for customers and projects
- Experienced in remote sensing: image processing and analysis
- Familiar with user communities, multi-disciplinary teams, and different clients
- Oriented towards problem-solving and timely delivery of results of high quality and accuracy
- Strong interest in bridging scientific knowledge and real planning practice

Dr. Arciniegas would like to declare his personal costs as an SME owner without salary.

Alexander, K.A., Janssen, R., Arciniegas, G.A., O'Higgins, T.G., Eikelboom, T., Wilding, T.A., 2012. Interactive Marine Spatial Planning: Siting tidal energy arrays around the Mull of Kintyre. PLoS ONE, 7(1): e30031. doi:10.1371/journal.pone.0030031.

Arciniegas, G.A., 2012. Map-based decision support tools for collaborative land use planning. PhD thesis. VU University Amsterdam. 148 pp. Available online at: <http://dare.uvu.vu.nl/handle/1871/39296>

Arciniegas, G.A., Janssen, R., 2012. Spatial decision support for collaborative land use planning workshops. *Landscape and Urban Planning* 107(2012), 332-342.

Arciniegas, G.A., Janssen, R., Rietveld, P., 2013. Effectiveness of collaborative map-based decision support tools: results of an experiment, *Environmental Modelling & Software*. *Environmental modelling & Software*, 39(2013), 159-175.

Arciniegas, G.A., Janssen, R., Omtzigt, N., 2011. Map-based multicriteria analysis to support interactive land use allocation. *International Journal of Geographical Information Science* 25(12), 1931-1947.

Part of relevant projects:

KnowSeas FP7

FOODMETRES FP7

Participant II - Delta Development Group (DEL CG)

Delta is an independent, privately owned real estate development and investment company. We were founded in the Netherlands in 1988 and since then have expanded internationally with offices in Germany, France and Italy. We have a strong backbone in commercial real estate with a proven track record in the field of high quality project development and value-adding asset management.

Commitment: At Delta, real estate development is not about producing more, it is about making more of what we create and making more of what already exists whilst maintaining a good balance between function and profitability. We adhere to the principles of Cradle to Cradle™ Design for Disassembly in able to ensure a transition towards a circular Economy. Our commitment is therefore to create sustainable buildings of quality that will retain their value indefinitely whether a new development, a redevelopment or an upgrade of an existing object. By our focus on projects that improve and give positive spin off to their surroundings we give something back to our society and environment, while remaining a successful, viable and visionary company.

Organisation: Delta is led by its Director/owner Coert Zachariasse. Each country has its own director and local management team. Within the company there is a separate asset management division. Via means of a regular international meeting strategy we are able to structure our business and meet our challenges from a European perspective while at the same time manage our cross border growth ambitions.

Partners: Our compact organisation of highly skilled and experienced professionals is complemented by a network of excellent long-term and reliable partners giving flexibility and strong added value. At Delta, we know that good partnerships and good collaboration come from transparency and sharing information. Clear, open communication that involves and engages people which in turn leads to motivation and impetus. From this open and frank approach as well as our drive to improve and innovate, stems our competitive edge.

Key personnel responsible for REPAIR

Dr. O.J. (Olaf) Blaauw (male), Senior Strategic Consultant. Olaf has an extensive background in Systems Thinking and is working with Delta specifically to conceptualise and implement the CE Hotbed Project in Haarlemmermeer, ensuring the proper transformation of data into information on behalf of the REPAIR program

Participating in the REPAIR program

BIOKOM is a municipality owned city service company. This is the biggest waste management company in the Sout-West part of Hungary: with more than 60 years of operational experience, it serves 460.000 inhabitants and 4.800 companies in 233 cities and villages. We are certified of ISO 9001:2009, ISO 14001:2005, and ISO/IEC 27001:2006. The company is also responsible

for several city operation activities: road maintenance, winter services, car parking, public park and forest maintenance, waterway and drainage maintenance.

It is also involved in:

- applied research projects,
- strategic planning of the city,
- higher education (BIOKOM is an industrial partner of the local university in dual education).

Personnel being involved in REPAIR

Mr. Tibor KISS (male), managing director of BIOKOM since 1995. PhD at the Faculty of Earth Sciences of the University of Miskolc, in 2008. He is the leader of the **SMART CITY Technologies** research team of the University of Pécs (2012 onward). Senior Research Fellow at the Faculty of Engineering and Information Technology of the University of Pécs, responsible for lectures on waste management, environmental economics, and city operations (2009 onward). He was Commissioner of Ministry of Environment and Water (2008-2009).

Relevant Publications

Kiss, T., – Drescher, L.: Effects of the landfill tax on waste management. Pollack Periodica An International Journal for Engineering and Information Sciences. (DOI: 10.1556/Pollack.9.2014.S.4) Vol. 9, Suppl., pp. 31-42, 2014, Akadémia Kiadó, Budapest (ISSN: 1788-1994) Editors: Amalia Ivanyi and Peter Ivanyi

Kiss, T.: Systemic approach in city operation – Possible synergies between waste management systems and energetics. Pollack Periodica An International Journal for Engineering and Information Sciences. (DOI: 10.1556/Pollack.7.2012.3.6) Vol. 7, No. 3, pp. 55–63, 2012, Akadémia Kiadó, Budapest (ISSN: 1788-1994) Editors: Amalia Ivanyi and Miklos Ivanyi

Kiss, T.: Coordination and ecomarketing: market conform harmonization of the interests of economy and state. Abstract. Proceedings of the International Innovation Conference for Co-operation Development (InCoDe), Published by Faculty of Business and Economics at University of Pécs (ISBN: 978-963-642-248-6) Pécs, 2008. október 16-18. pp.349-350 Editor: Fojtik János

Kiss, T. – Girán, J.: Local Resources, Local Values; The Pécs ECOCITY – Mecsek-Dráva ECOREGION Program In: Sustainable Triangle 1.; Pécs – Graz – Maribor; Sciences, Municipalities, Companies for the Sustainable Future, Pécs, 2006 pp. 99-109. (ISBN-10: 963-642-122-6; ISBN-13:978-963-642-122-9) Published by University of Pécs, Faculty of Sciences Institute of Geography, editor: Ronczyk Levente, dr. Tóth József, dr. Wilhelm Zoltán. B&D Stúdió, Pécs

List of Relevant Projects

- Planning of regional waste management programs in Hungary ("South-Balaton Sio-valley" and "Mecsek-Drava", 2000-2014). Operation of the latter one since 2014.
- Reorganization and rationalization of Pécs city management public services (2011-2012)
- Creation of the environment strategy of Pécs, based on the Ecocity - Ecoregion concept (2005).
- Introduction of the selective waste collection in Pécs (1998), kerbside collection of packaging material and garden waste (2003)
- Construction of the first Material Recovery Facility in Hungary (1998)

Activities

- 2 Material Recovery Facilities
- Several civic amenity sites
- Mechanical-Biological Treatment plant
- Composting plant
- Transfer stations

- 30+ waste trucks

Concept of Gert Gutsche Rümenapp Stadtplanung und Mobilität (GGR)

Gertz Gutsche Rümenapp (GGR) was founded in 2003 as a spin-off of Hamburg University of Technology. Today, 5 managing partners and 7 employees are working on a variety of projects for clients in municipalities, counties, state and federal ministries and other public bodies in four interrelated fields:

- transport and mobility
- regional development and infrastructure
- urban development and public finances
- simulation of regional development processes

GGR applies a methodology that links the close participation of the relevant stakeholders with a sound GIS- and model based analysis of the problems and the impact assessment of the possible solutions and strategies.

Key personnel being involved in REPAIR

Dr.-Ing. Jens-Martin Gutsche studied transport planning in Berlin, Lyon und Dresden und was researcher at Hamburg University of Technology from 1998 to 2005. He also was Visiting Scholar at Center for Urban Policy Research (CUPR) at Rutgers University, USA. His scientific focus is the link between travel behaviour and urban structure, the impact of new housing projects and its long term financial impact for the public bodies and the private households budgets. His special focus lies upon the "costs of sprawl". **Dipl.-Ing. Max Bohnet** studied spatial planning in Dortmund and Madrid. He worked in consultancies in Brussels and Dortmund until 2005. From 2005 to 2014 he worked as researcher at Hamburg University of Technology on various research projects in the field of spatial development, transport and mobility. Since 2010 he is one of the partners at GGR.

Dr. Gutsche would like to declare his personal costs as an SME owner without salary.

List of relevant publications

Bohnet, Max; Gutsche, Jens-Martin; Menze, Axel; Stul, Dmitry; Weiner, Thomas (2006): GIS-Werkzeuge zur Aufbereitung von Strukturdaten für Verkehrsmodelle ECTL Working Paper 34, Hrsg.: Technische Universität Hamburg-Harburg, Institut für Verkehrsplanung und Logistik, Hamburg 2006.

Bohnet, Max; Gutsche, Jens-Martin; Menze, Axel (2006): Verkehrswirkungen der Regionalplanung. Ein Leitfaden zur Nutzung von Verkehrsmodellen durch die Regionalplanung zur Abschätzung der verkehrlichen Auswirkungen ihrer Leitbilder und Einzelentscheidungen. Bundesministerium für Verkehr, Bau und Stadtentwicklung (BMVBS) (Hrsg.): Werkstatt Praxis

BBR (2006): Siedlungsentwicklung und Infrastrukturfolgekosten. Bilanzierung und Strategieentwicklung. Bonn.

BMVBS/BBSR (2010): Regionale Daseinsvorsorgeplanung. Ein Leitfaden zur Anpassung der öffentlichen Daseinsvorsorge an den demographischen Wandel. Bonn.

BMVBS (2011): Regionalstrategie Daseinsvorsorge. Denkanstöße für die Praxis. Berlin.

Gertz, Carsten; Maaß, Jacqueline; Guimarães, Thiago; Bohnet, Max et al.(2015): Auswirkungen von steigenden Energiepreisen auf die Mobilität und Landnutzung in der Metropolregion Hamburg - Ergebnisse des Projekts

EUROLAN – Energiepreisentwicklung und Landnutzung. Harburger Berichte zur Verkehrsplanung und Logistik, Schriftenreihe des Instituts für Verkehrsplanung und Logistik, Band 13, herausgegeben von Heike Fläming und Carsten Gertz, Technische Universität Hamburg-Harburg, ISBN 978-3-95645-507-0

GGR (and its partners working for Hamburg University of Technology) developed several software tools used in projects with clients, such as

REFINA Kostentransparenz: Cost estimation tool for new housing development recommended by four state governments to their respective municipalities.

FIA RegioProjektCheck and Planspiel Flächenhandel

GIS-based Travel Demand Models for different cities and regions (e.g. Hannover Region, Kassel Region, ...)

Development of a GIS-based accessibility tool for the Frankfurt RheinMain Metropolitan Area

GIS-based small scale analysis and forecasts of population and jobs for different regions

An agent-based simulation of landuse and transport for the metropolitan region of Hamburg within the project €LAN funded by the German Ministry of Research

Participant 12 - OVAM - Public Waste Agency of Flanders (OVAM)

The Public Waste Agency of Flanders, better known as OVAM, is a dynamic Flemish Government institution that was established in 1981. OVAM prepares legislation on waste, material and soil management on behalf of the Flemish Minister for the Environment. Once the legislation has been approved by the Flemish Government, OVAM implements the legislation and supervises the implementation thereof. More important, however, is that the Agency also supports and acts as a partner for universities and institutes, companies, industries or citizens committed to working towards a better living environment for the future.

Over the past 30 years (the first Waste Decree dates from 1981), the way in which we handle waste has fundamentally changed. The policy advocated by OVAM is continuously evolving. Whereas this policy initially focused on cleaning up waste and setting up an efficient waste management infrastructure, the focus has now shifted to waste prevention and sustainable material use.

Today, Flanders' waste management and its waste management policy are among the most successful in Europe. About 71% of the household waste in Flanders is collected separately at the source in order to be reused, recycled or composted. Some 27% is incinerated in incinerators equipped with state-of-the-art flue gas cleaning systems and energy recovery systems. Less than 1% of all household waste is being landfilled.

To achieve these objectives, the Flemish Government and OVAM developed a whole host of policy instruments, including levies, takeback obligations, voluntary environmental agreements, landfilling and incineration bans, waste management plans, awareness raising and information campaigns, financial schemes, etc.

Despite the excellent results of our waste management policy and systems, we are still wasting materials and energy on a massive scale. The obvious solution is to produce and consume in a more sustainable way. Traditional waste management focuses mainly on the end-of-life phase, the phase where a product becomes waste. Recently OVAM has broadened its horizon towards sustainable material management. The idea behind this is to manage the entire material chain, from "cradle to cradle". As primary raw materials are becoming more and more scarce, the aim is to close the material loop and to become a green circular economy where discarded products are reused and recycled to replace primary raw materials.

With this goal in mind, we actively go for the transition towards a sustainable materials management. Since 2012, the new Materials Decree stands for the new policy direction, with the development and support of a number of instruments and measures to help producers, designers and consumers to apply principles of cleaner production, eco-efficiency, ecodesign and innovation. The Flanders' Materials Program was initiated by OVAM to work towards a sustainable materials management, together with a broad group of stakeholders. 45 actions make the transition concrete, Plan C is a network that continuously develops the long term vision. And the Policy Research Centre (SuMMa) studies sustainable materials management and provides academic support.

OVAM was a partner in the Interreg IVC project "C2C network" (www.C2Cnetwork.com). In this project several EU regions shared regional cradle to cradle good practices.

OVAM was also a partner in the Regions for Recycling (R4R www.regions4recycling.com) project. This Interreg IVC project was

a 3-year European project (2012-2014) aiming to enable its partners to improve their recycling performance through consistent comparisons and an exchange of good practices.

OVAM was lead partner of a InterregIB project 'CityChlor' (www.citychlor.eu) that aimed to improve the quality and minimize the pollution of soil and groundwater.

2.4 personnel being involved in NEPAIR

Elmar Willems (male) As a policy officer at the department of Policy Innovation Elmar is responsible for taking up specific projects and exploring new policy-solutions with regard to sustainable materials management. Elmar has been working on and with local governments (eg. Ghent), innovative and sustainable business models, the sharing economy, ecodesign, policy evaluations, and more. He has been coordinating the realization of new legislation like the Materials decree up until February 2012. He has actively pursued new ways of policy-making through the concept of Multi-actor governance. Elmar has a strong expertise on end-of-waste legislation and practices. During a previous job at OVAM, as policy officer organic waste, Elmar was specialized in bioplastics and animal-by-products.

Veerle Labeeuw (femal) (Master in Political and Social Sciences – Communication) is Program Manager in the Flanders' Materials Program. Her expertise lies in project management and in motivating and inspiring multidisciplinary groups to work together. Specific topics Veerle is working on are: increasing the knowledge on circular economy in educational programs and the transformation of urban metabolism from its current operation as an inefficient and wasteful linear input-output system into a resource-efficient and regenerative, circular system. In her previous function at OVAM VL was the Project Manager of an Interreg IVB NWE project named CityChlor. In this project Veerle had the final responsibility for all the results and publications and for the smart cooperation between the 9 partners from Belgium, France, Germany and The Netherlands. With her background as communication expert she will assure a good dissemination of the results and a straight forward communication throughout the project.

Hans Maes (male) studied Ecology at the University of Antwerp and Environmental Technologies at the University of Leuven. He is a policy officer responsible for creating new types of cooperation between the Flemish Government and several local governments (eg. Ghent) in Flanders. The good results of the past regarding waste management was a result of the strategic partnership between the different local governments and the OVAM. New challenges in the field of circular economy demand a renewal of this partnership. A shared, intergovernmental ambition is the first step for testing/puzzling out new contemporary solutions, realizing a change in real terms. Hans creates a starting point, a fundament for realizing new partnerships with different Flemish cities. His active support is crucial for reaching a state of trust between the partners. Trust is a key concept for reaching a win-win prospect. Hans has a profound interest in communication techniques, eg. cooperated aimed negotiations, and 4th generation time management. On a previous job at OVAM, Hans worked as policy officer on the topic of ship waste.

Eline De Rocker (female) is expert environmental management & coordination and in her function at the OVAM Eline advises citizens, industry and governments on all aspects of building waste (eg asbestos). Eline is also project leader of a project on closing the material loop for mineral wool, in which she collaborates with the sector, the local governments (Gent en Destelbergen) and the intercommunal(?) IVAGO.

Ann Braekevelt (female) (master in geography and environmental sanitation) is project manager in the waste and material policy. She has launched the separate collection and quality control on the treatment of bio- and greenwaste in Flanders in the nineties. She is still involved with the optimization of it and with actions and (European) research projects for e.g. the prevention and reduction of the food waste in the Flemish region. She coordinated several Flemish household and biowaste management plans. Recently she has realized a compromise between environment and energy targets with all stakeholders (from municipalities to private sector) and the Flemish government for the execution of the first biomass action plan 2015-2020. Her expertise lies in policy analyzes based on local data, reaching (bio)waste policy agreements, and results on the field in closing the bio(material) circular system based on good communication with different groups of stakeholders. She introduces often the principle of "learning by doing" and focus on realistic goals in several study projects with e.g. municipalities.

Participant 13 - Municipality of Haarlemmermeer (GHM)

Municipality of Haarlemmermeer is a municipality in the Netherlands, in the province of North Holland. It is a polder, consisting of land reclaimed from water. GHM is home to 145.000 inhabitants and an economic strong region with the (economic) powerhouse of Schiphol Airport in its boundaries. Over 9.000 locally, nationally and globally operating companies, pose challenges towards resource management. With projects like the par 2020 GHM is a frontrunner in the field of circular economy among Dutch municipalities. The more rural characteristics of the polder (lowlands) and therefore peri-urban characteristics which are in strong contrast to the urban area of Amsterdam. Makes it a perfect showcase for Repair.

Key personnel being involved in REPAIR

Joost van Faassen (male) is strategic spatial planner and urban designer, working for the municipality of Haarlemmermeer. He is involved in spatial planning and economic-/ airport-affairs, projects dealing with urban design, economic development and sustainability both on meta- and micro level. Van Faassen is directly involved in the decision-making process concerning Amsterdam Airport Schiphol. His focus is on creating innovative policies and noise-ascending measures, to redefine governance around Schiphol. Main policy and research related developments are the spatial and economic development of the Schiphol region (REVS, project leader, with B. de Jong), member of the integral design team of the Schiphol corridor, core member of the team working on the development around sustainability and economics in accordance with the Ellen MacArthur foundation (as a regional member), co-creator (with B. de Jong), of the fundamentals of the Internationale BauAusstellung Airport Region (in progress and early stage), aiming at defining social, economic, spatial policy in another way than is established now. Furthermore, creating positive awareness, innovation and governance models to become the new sustainable order of an airport region. Van Faassen was also a member of the Better Airport Regions (BAR) team for the municipality. He has given guest lectures in Zurich (Swiss) and in the Netherlands. He obtained a BSc in traffic engineering and urban design at the Polytechnic University of Leeuwarden and studied at the Academy of Architecture Amsterdam. Van Faassen has been affiliated with various architecture firms in The Netherlands and United States.

Participant 14 - Campania Regional Authority (CRA)

Campania Region is an Italian region situated in the South of Italy. It has 5.856.649 inhabitants.

Campania Regional Authority is an orientation and planning authority. It sets laws and its administrative functions can be either delegated by State or exerted by itself. In order to develop laws application activities it has a proper administrative organization. It is divided in 8 Areas (Assessorati). Each Area comprehends Departments (Dipartimenti) which include Head Directorates (Direzioni Generali). Each Head Directorate is divided in Offices (U.O.D.). Head Directorate of Territorial Government (hereafter referred to as DG09) is a part of the Territorial Policies Department.

DG09 is going to take part to REPAIR Project, considering its institutional roles and all its directives included in the Regional Territorial Plan (PTR Pianificazione Territoriale Regionale). It is going to identify urban and regional model of planning to find eco-innovative solutions to prevent "waste" generation and to promote recycling approaches. Its main application field is a dynamic and efficient resources management especially in the peripheral areas. Final research target will be to facilitate the transformation of the waste-areas in the peripheral areas into instruments for re-naturing cities. Through its Territorial Informative System (SIT – Sistema Informativo Territoriale) DG09 will be able to provide, in digital version, maps, data and information about Campania Region.

Key personnel being involved in REPAIR

Pietro Angelino (male)– graduated in Engineering. He has attended a course of energy management. At present he's Head Executive Officer of DG09.

Previous regional roles: Executive Officer of Civil Engineering Directorate in Caserta; Executive Officer of Civil Engineering Directorate in Naples; Executive Officer of State Project Directorate.

Donata Vizzino (female) – Architect and Executive Officer of U.O.D. 04 (Planning and Monitoring of urban and environmental requalification).

Antonella Calligaris (female) – Officer of UOD 04 – Architect and Expert in Regeneration and Urban Quality.

Flora Guida (female) – Employee in the Administrative Office of DG09. Graduated in Foreign Languages.

Key relevant publications:

Regional Territorial Plan (PTR Piano territoriale Regionale) published on BURC nr. 45 bis , 10th november 2008;

Guideline about Urban Quality ratified through as per Resolution nr. 572 – 22nd July 2010 published on BURC n. 52 , 2nd August 2010.

Participant 13 - Pheno Horizon (PHH)

PHENO HORIZON (a brand of OLP Sp. z o.o.) aims at creating a better life space within cities, communes, districts, provinces and whole regions. This is a consulting company which joins specialist knowledge on urban planning, economic analysis and developing strategies. In our projects we focus a lot on social participation. So far we have carried out projects in Poland, taking advantage of our perfect knowledge of social conditions. We base on global strategic guidelines. The stakeholders are included in the project development process – main trends are developed with their participation. We think that each of the partners invited for cooperation on various stages of the process brings in an inestimable value.

Key personnel being involved in REPAIR

Malgorzata Grodzicka-Kowalczyk (female) – a town-planner, deals with space planning processes. Malgorzata is a cofounder and the main designer of Pheno Horizon. She has graduated Faculty of Architecture, Civil Engineering and Environmental Engineering of the Institute of Architecture and Urban Planning at Lodz University of Technology. She has also completed post-graduate studies at Warsaw University of Technology – Spatial Planning, and at University of Lodz – The Real Estate Market – Valuation. Since 2006 a manager of a multidisciplinary team developing acts of local law. Author and co-author of many planning documents – including documents for Lodz province region.

Maciej Kowalczyk (male) – a sociologist mainly focused on cities and regions development strategies. Pheno Horizon cofounder and director. A graduate of Faculty of Economics and Sociology at University of Lodz. He manages projects related to appointing new directions of development – using their specific potential and current economic and social conditions, and development trends. Author of brand strategies and numerous promotional campaigns in marketing of places. Responsible for social participation in projects developed by the team.

Lukasz Pancewicz (male) – Pheno Horizon partner, PhD, member of the International Society of City and Regional Planners, Northern Chamber of the Town Planners, Society of Polish Town Planners, Graduate of the Gdansk University of Technology (Msc and PhD), since 2013 a chief urban planner at the Municipal Planning Bureau of Lodz, where he prepares Lodz Structure Plan 2030. Lukasz taught at Faculty of Geography and Oceanography University of Gdansk, he currently is an Assistant Professor at the Faculty of Architecture, GUT. Lukasz worked as a town planner in Poland (PPR DOM sp. z o.o.), Ireland (RPS Planning and Environment Dublin), and as intern for Boston Metropolitan Area Planning Council (MAPC). In 2011-2012 he took part in SPURS at the Department of Urban Studies and Planning, Massachusetts Institute of Technology (MIT).

Katarzyna Hess (female) – Pheno Horizon partner. She has graduated Faculty of Civil Engineering at Czestochowa University of Technology. She manages preparation and implementation of strategic documents, economic and development programmes as well as technical and urban infrastructure plans. Responsible for managing investment processes in the province of Łódź. She perfectly knows aspects of cities functioning and local law conditions.

All key personal has either an employment contract with PHH or under a direct contract of PPH.

Participant 14 - Bauer Umwelt GmbH

Bauer Umwelt GmbH is one of many subsidiaries of the BAUER Group, and it is held under the Resources division of the company. Bauer Resources' GmbH Headquarter is located in Schrobenuhausen, Germany and was established in 2007. It is focused on a number of very important key fields for the future: water, environment and natural resources. Bauer Umwelt provides a comprehensive range of services including planning and consulting in several areas of the environmental industry.

The company's expert remediation work is backed by strong in-house manufacturing facilities that build the necessary equipment to complete the work in the field. As well as treating contaminated soil and water, the company also specializes in landfill site remediation and waste disposal. Bauer Umwelt operates its own soil treatment centres in the states of Bavaria, Thuringia, Saxony and Hamburg, which treat and recycle materials from around Germany and neighbouring European countries.

Key personnel being involved in REPAiR

Manuel Sakowski (male) is the Head of Waste Management Department at BMU since 2013. He holds a diploma degree in Logistics with a specialization in quality and environmental management, circular economy, planning of logistic systems and transportation. From 2006 to 2009, he was a research assistant at RIF e.V. in the field of quality management. He has many years of working experience as a project manager in the area of plant technology, substitute fuels, waste treatment and waste storage installations, as well as in the area of setting up key performance indicator systems that enables operational business controlling. In his current position at BMU he is responsible for all development related issues as well as for financial concerns.

Gregor Schmid (male) holds a PhD in Geoscience with specialization in Geomicrobiology and Analytical Microscopy. He worked on the immobilization of heavy metals by biogenic iron minerals during his PhD.

Since 2016 he is employed as a development manager at the BMU, responsible for the development of (bio-)remediation and treatment techniques of contaminated soils.

Both will contribute towards the development of specific solution for challenges related with remediation within REPAiR. BMU will also contribute with their expertise and facilities in the data collection, specifically in the Italian and German case studies.

List of relevant publications:

Schmidt-Modrow, Thomas; Mesch, Johann: Constructed wetlands to clean up poisonous cocktails. In: E.L.B.W., March 2011.

Schmidt-Modrow, Thomas; Karius, Michael: Hot-Spot remediation with replacement borings Diameter 2300 mm. In: TerraTech, Zeitschrift für Altlasten und Bodenschutz (WLB), 3/2012.

Schmidt-Modrow, Thomas; Haidacher Dominic: BAUER executes complex soil remediation in Milano (Project City Life). In: TerraTech, Zeitschrift für Altlasten und Bodenschutz (WLB), May 2012.

Schmidt-Modrow, Thomas; Meißner, Torsten: Zugunglück Bleicherode – schnelle Hilfe und anschließende Sicherungsmaßnahmen. In: TerraTech, Zeitschrift für Altlasten und Bodenschutz (WLB), 1/2013, p. 16.

(Translation: Train accident in Bleicherode – rapid assistance followed by technical safeguards)

Schlenker, Uwe: Industriestandort Leuna, Mikrobieller Abbau von organischen Schadstofffrachten in Böden eines ehemaligen Hydrierwerks. In: TerraTech, Zeitschrift für Altlasten und Bodenschutz, 4/2013, p. 10-11.

(Translation: Microbial reduction of organic contamination of polluted soils)

Richter, Rüdiger B.; Hosemann, Peter; Schmülling, Marcus: Behandlung und Deponierung natürlicher radioaktiver Abfälle (NORM) der Erdöl- und Erdgasindustrie - ein Überblick. In: Altlasten Spektrum, 1/2014, p. 22-31. *(Translation: Disposal methods for natural radioactive waste yielded in the oil and natural gas industries)*

Tidden, Frank, Schlenker Uwe: Mikrobieller Abbau von organischen Schadstoffen in Böden und Grundwasser im Umfeld der „Alten Raffinerie Leuna“ in Sachsen-Anhalt. In: 14. Karlsruher Altlastenseminar (ICP), July 2014. *(Translation: Microbial reduction of organic contamination of polluted soils and groundwater in the area of "Alte Raffinerie Leuna" in Saxony-Anhalt)*

Mair, Willi: Grundwasserreinigung unter „explosiven“ Bedingungen. In: bbr, Fachmagazin für Leitungsbau, Brunnenbau und Geothermie, 3/2015, p. 10. (*Translation: Groundwater purification under explosive conditions*)

Tidden, Frank, Illing Sebastian: Sanierung eines LHKW-Grundwasserschadens über Tiefdrainage im Hebeverfahren. In: ITVA Altlastensymposium, June 2015. (*Translation: Decontamination of LHKW-groundwater damage using drainage and lifting procedure*)

Scope of relevant projects:

Brownfield Remediation: Soil Remediation and Disposal – Wedel

- **Client:** City of Wedel
- **Location:** Wedel, Germany
- **Execution:** Nov. 2011 – Dec. 2012
- **Scope of performance:** 160.000 m³ contaminated soil
- **Contaminants:** PAH

Brownfield Remediation "Sattleraltlast": Schonungen, Germany

- **Client:** District Administration of Schweinfurt
- **Location:** Schonungen, Germany
- **Execution:** Oct. 2013 – Sep. 2015
- **Contaminants:** Heavy metals and LHKW

Landfill Restoration: Biological Soil Treatment – Nimr Hazardous Waste Yard

- **Client:** Petroleum Development Oman
- **Location:** Nimr Oilfield, Oman
- **Execution:** Sept. 2011 – July 2012
- **Scope of performance:** 167.000 m³ contaminated soil
- **Contaminants:** TPH

Brownfield Remediation: Grenzach-Whylen

- **Client:** Roche and BASF
- **Location:** Grenzach-Whylen, Germany
- **Execution:** Sept. 2015 - 2020
- **Scope of performance:** 310.000 m³ of highly contaminated soil
- **Contaminants:** mixture of hazardous substances of chemical and pharmaceutical industry

Participant 17 - IVAGO (IVAGO)

IVAGO is a public private inter-municipal association. IVAGO manages the household waste for more than 275.000 inhabitants and more than 5000 small enterprises. The city of Ghent and the municipality Destelbergen are the government partners. ECOV is the private partner. IVAGO is the first inter-municipal waste management company which was established in Flanders. Since 1996 IVAGO is operating as a future-oriented and modern waste collecting, management and recycling company. IVAGO runs a high-tech incinerator with energy recovery. IVAGO annually processes 100.000 tons of combustible household waste and provides for its own need for electricity and heat, but also delivers electricity to the public grid. Through an underground steam pipe IVAGO helps to provide for the heating of the Ghent University Hospital. IVAGO runs six recycling parks for 40 different waste streams and is therefore the ideal Partner for REPAIR's case study in Flanders. One of the key projects the coming years is the introduction of a system of waste collection using containers equipped with 'diftar'-system that are placed partially under the surface. The plan is to install the coming 3 to 5 years more than 225 containers and is therefore the ideal Partner for REPAIR's case study in Flanders.

Alain Neels (male) has a degree in industrial maintenance engineering and started his career in the automotive business. After working as a plant manager in a metal packaging company he is now director of operations at IVAGO with 15 years of

experience in managing waste management companies. Besides the operations he is the project manager of the 'diftar-container' project.

Relevant infrastructure to the project

- Separate collection of organic waste in the city of Gent and Destelbergen since 1998
- Operation of the combined heat and power plant since 2005
- More than 170 trucks for the waste collection and transport
- More than 50.000 collection points using small diftar-containers (2 - wheels)
- One incineration plant for residual waste with a capacity of 100.000 tons/a

Participant 18 - Stadtreinigung Hamburg (SRH)

With a population of 1.8 million residents and more than 120.000 businesses, the Free and Hanseatic City of Hamburg is one of the most attractive economic centres in northern Europe. Hamburg's cosmopolitan character is also evident in the promotion of innovative growth sectors, such as the renewable energy sector. The SRH is a public waste management organisation that offers not only environmentally friendly waste collection and recycling services, but also cleaning services such as keeping roads, walkways and public areas clean and safe in summer and also in winter. The SRH is a public-law company with approximately 2.600 employees, which has performed services as prescribed by state law. This structure creates the framework as a public law disposal company and, at the same time, ensures that SRH has the flexibility of a modern service company. SRH is owned by the Free and Hanseatic City of Hamburg. SRH guarantees responsible and sustainable waste management, while decisively contributing to the protection of the climate and resources. In order to promote waste sorting, SRH launched a recycling offensive that has been underway since 2011, thereby maximising the amount of recycled materials. To collect the maximum amount of organic waste for the production of renewable energy, SRH offers all private customers green bins for organic and green waste. The company selects the most effective recycling methods for all recyclable waste types. For this reason, SRH has a network of waste treatment plants to truly get the best out of waste in consideration of ecological and economic criteria. SRH is in charge of material flow management for over a million tonnes of waste and has now achieved a recycling quota that eliminates nearly 400.000 tonnes of carbon dioxide annually.

Key personnel being involved in REPAIR

Dr. Stefan Lübben (male), agricultural scientist, is the climate protection manager of SRH since 2007. As project director, he implemented the separate collection of bio-waste in Hamburg and has given his expert opinion on compost quality in the first years of composting at the SRH. In the role of project leader, he managed several scientific projects about energy, from organic waste (biogas / gasification) and resource management to resource efficiency (organic matter / strategic metals). In his role as expert and consultant to the company, he evaluates the action of the SRH in the matter of climate protection and he reports annually to the Hamburg Ministry of Urban Development and Environment.

List of relevant publications:

Gasification of urban biomass residues for SNG production.- 22nd European Biomass Conference and Exhibition 2014

Household and garden waste in the city of Hamburg – Their energetic potential and integration possibilities into a biorefinery approach.- 3rd International Conference on Engineering for Waste and Biomass Valorisation 2010

Biomass material flow management of Bergedorf district in the city of Hamburg.- Müll und Abfall, 3, 2015, 112-122

Neue Methoden zur Erfassung von organischen Abfällen aus Haushalten – Vorstellung und Bewertung.- www.berbion.de – Symposium 2011

5) Beitrag der Stadtreinigung Hamburg zur Erreichung der Klimaschutzziele der Freien und Hansestadt Hamburg.- Abfallwirtschaft in Städten und Ballungsräumen, ANS-Symposium 2010

6) Hamburg's experiences with the collection of organic waste via underground systems.- Müll und Abfall, 3, 2015, 123-125

7) Maßnahmen zur besseren Potenzialerschließung kommunaler und gewerblicher Bioabfälle.- Hamburg T.R.E.N.D 2011

Relevant activities to the project

Since 2011, SRH has operated a dry fermentation plant upstream of its composting plant – this biogas- and compost plant is one of the largest of its kind in Germany. Every year, up to 70.000 tonnes of organic waste are pre-treated in a fermentation process making it possible for up to 28 million kilowatt hours of environmentally friendly energy to be produced. This would be enough electricity for approximately 10.000 households. The volume of organic waste, which is reduced by nearly half during fermentation, is then composted into a nutrient-rich soil fertiliser. SRH has also been significantly involved in another wet fermentation plant since 2006. There, enough biogas to generate more than ten million kilowatt hours of electricity and district heating, is produced based on decomposition of foodstuffs and leftover meals. Waste combustion in modern incineration plants in Hamburg also produces climate-friendly energy. The amount of electricity and heat produced at proprietary and contract plants totals more than one million megawatt hours annually. For more than 20 years, a combined heat- and power plant built at a former landfill for household waste, converts landfill gas into energy.

SRH will continue to play its role as a pioneer in its sector, by implementing concepts for the benefit of the citizens of Hamburg and the environment, now and in the future. For example, SRH is one of the co-initiators of a platform where representatives from large German urban centres exchange information and experience on the topic of climate protection of a city cleaning company. As a member of national and international organisations, it also utilises forums for exchanging information and experiences. Amongst others, the SRH is a member of the German Association of Municipal Companies (VKU) as well as the International Solid Waste Association (ISWA). Electro-mobility, in the form of economising or completely eliminating conventional fuels for operating a fleet of more than 600 vehicles, is becoming a topic of increasing importance at the SRH. In this way, SRH has successfully saved up to 250.000 litres of fuel and prevented the emission of over 600 tonnes of carbon dioxide every year. SRH is taking part in various tests and projects exploring the use of electric vehicles. Currently, more than 20 electric vehicles are in use at the SRH.

SRH was a member in the BERBION-project (www.berbion.de). The main goal was the production of energy from organic waste from households, gardens and the maintenance of parks and dykes

Relevant infrastructure to the project

- Separate collection of organic waste in the city of Hamburg since 1994
- Operation of the combined heat and power plant on a landfill since 20 years
- Operation of the wet fermentation plant together with a CHP-Plant since 2006
- Operation of a compost-plant with an annual input of 32,000 Mg organic waste since 1994
- Operation of a dry fermentation plant with an annual input of 70,000 Mg organic waste since 2011
- More than 200 trucks for the waste collection and transport
- One incineration plant for pure organic matter with a capacity of 160.000 tons/a

2.2 Third parties involved in the project (including use of third party resources)

Participant 1: Leibniz University of Technology (TUD)

Table 1.1: Direct costs of subcontracting

1: TUD	Cost (€)	Justification
Subcontracting	€ 27.000	Reprogramming and development of different features of the open earth data platform in relation to the adaptation and further development of the open earth data platform towards the specific needs of REPAiR. This very specific knowledge from the field of computer sciences is not existing within the REPAiR consortium and will therefore be subcontracted.

The consortium adheres to the principles laid down in the European Code of Conduct for Research Integrity, the Charter of Fundamental Rights and the Treaty on the Functioning of the European Union. All consortium members will receive a copy of the European Code of Conduct for Research Integrity.

All REPAiR researchers will adhere to their own institutions' and national ethical guidelines, for example the coordinator TU Delft is bound by the TU Delft Code of Ethics (last update 2012) and the Netherlands Code of Conduct for Scientific Practice, which defines the essential principles of research integrity, responsibility and transparency. All consortium members will avoid plagiarism of any kind and abide by the principle of intellectual property and joint data ownership in the case of research carried out in collaboration with other researchers. An open atmosphere in which researchers feel free to question each other's conduct and address issues about which they have doubts, will be encouraged at all times. The coordinator will act as ethical issues ombudsman and can be contacted confidentially to discuss any issues which may arise.

REPAiR researchers are aware that they are accountable towards their employers, funders, as well as, on more ethical grounds, towards society as a whole. They will adhere to the principles of sound, transparent and efficient financial management and cooperate with any authorised audits of their research, whether undertaken by their employers/funders or by ethics committees. Methods of collection and analysis, the outputs and, where applicable, details of the data will be open to internal and external scrutiny, whenever necessary and as requested by the appropriate authorities.

REPAiR researchers will at all times adopt safe working practices, in line with national legislation, including taking the necessary precautions for health and safety and for recovery from information technology disasters, e.g. by preparing proper back-up strategies.

REPAiR has the following three ethical issues:

- the research involves human participants;
- there are volunteers for social science research involved and
- personal data is collected and stored.

Research participants are identified in three different ways:

- Key stake holders for the development of circular economy will be identified through studies of , reports, planning documents, newspapers and via the network of the consortium partners.
- Students of the university, enrol to course that specifically state that they are part of REPAiR, and
- A representative sample of households, will be selected using existing data as well as random selection. Vulnerable individuals or groups are not a specific target group of the interviews.

To all three groups the following procedure of consent apply:

The following information will be provided to the research subjects before they participate:

- -The purposes of the research and information about what will happen with the results of the research.
- -The experimental procedures and a detailed description of the involvement of the participants, including the expected duration, and all the relevant procedures.
- -All benefits to the participants or to others which may reasonably be expected to occur. / That no benefits are expected to be connected to participation in the study.
- -A description of the procedures adopted to guarantee the participant's privacy:
- the levels of confidentiality, the measures to protect the data, the duration of the storage of the data and what will happen with the data or samples at the end of the research.
- -Contact details for researchers who can be contacted at any time to answer pertinent questions about the research and the participant's rights and that can be contacted in the event of a research related injury.
- -A clear statement that the participation is voluntary, that the refusal to participate will involve no penalty or loss of benefits to which the participant would otherwise be entitled and that the participant may decide, at any time, to discontinue participation without penalty.

- -Information about the organisation and funding of the research project

The consortium adheres to the principles laid down in the Charter of Fundamental Rights and the Treaty on the Functioning of the European Union that privacy and data protection are fundamental rights which need to be protected at all time. The consortium will handle data in accordance with EU Directive 95/46/EC (Data Protection Directive) and the relevant national legislations for the countries where data will be collected, processed, and stored.

The essential national legislations for the case study areas are the Dutch regulations, as data will be stored in the Netherlands predominantly:

Personal data protection:

Data cannot always be collected anonymously because of the need to clearly locate possible synergies for the development of circular economy, this counts rather for business data but may also be true for personal data in rare cases. Data will be coded so that each respondent will be assigned a reference number. The key linking respondent and reference number will be stored separately to the data and only the PULL coordinator will have access to it. Data will be stored in a key-word protected database to which only the direct team members working with the data will have access. It will not be shared with any external parties. Where ever possible the data will be aggregated to levels (Block, Neighbourhood), so that individuals cannot be singled out easily. Datasets that contain personal information as referred to in the Personal Data Protection Act (Wet Bescherming Persoonsgegevens) may be used only for historical, statistical or scientific research. Persons who use datasets containing personal data are required to comply with the Code of Conduct for the Use of Personal Data in Scientific Research (Gedragscode voor gebruik van persoonsgegevens in wetenschappelijk onderzoek) published by the VSNU (Association of Universities in the Netherlands) or the respective legislation of their country..

During the research, the research data will be stored in the REPAiR DataLab, using the OpenEarth DataLab facilities of 3TU.Datacentrum. This is a closed online data management environment for scientific and monitoring data, where we will safely store, share, edit, process and visualise the most up-to-date research data. Raw data and scripts will be uploaded from partners laptops or workstations. Once uploaded, REPAiR members can run Python and Matlab scripts in the cloud on their data. This processed data can be shared again in standard formats. This enables us to review and improve the scripts that run on the data, increasing the overall quality of the data and analysis. The OpenEarth DataLab enables collaboration and data standardisation.

After the research: the data that is suitable to make open available (including necessary documentation, metadata, code, consent form, software, etc.) will be stored and made open available in 3TU.Datacentrum data archive under the Deposit License agreement. By doing so, 3TU.Datacentrum is granted a non-exclusive licence to store the data and make them available to third parties. For data users, the General Terms of Use applies. These terms specify that, when re-using the data, they will clearly state the name(s) of the original author(s) and that the data will not be used for commercial purposes. 3TU.Datacentrum data archive is a long term archive with a Data Seal of Approval. 3TU.Datacentrum will keep the data available for at least 15 years in an open and - if needed - closed data archive. This complies with The Netherlands Code of Conduct for Academic Practice: "Raw research data are stored for at least ten years. These data are made available to other academic practitioners upon request, unless legal provisions dictate otherwise."

Please indicate if your project will involve:

- activities or results raising security issues: (NO)
- 'EU-classified information' as background or results: (NO)

6	Annex: Letters of Support User Board Members	79

The member has access to the project knowledge under the agreement of confidentiality. The travel costs to the project meetings will be reimbursed by the project.

The members of this Group will have the following tasks (examples):

- To provide input and feedback on the roadmap which will draw a clear strategy and work plan to further the application of the technologies created, investigated and invented in the project>
- To join stakeholder workshops in order to test and further develop the software developed by REPAiR
- To provide direction and additional requirements as they deemed necessary
- To participate in the evaluation of the project results, such as progress reports, analysis of logistic processes
- To participate in the evaluation of the final project results

It is the intention of the REPAiR consortium to share test results and elements of the scientific and technical evidence with individual stakeholders and as such provide stakeholders with an insight in the developed models, and decision support tools.

Yours Sincerely,

Signature:



Place:

Amsterdam

Date:

07-09-'15

RE-CYCLE ITALY

HORIZON 2020 LETTER OF SUPPORT USER GROUP Participation in the REPAIR User Group

On behalf of the university research network "Re-cycle Italy" I hereby like to confirm our participation in the proposed REPAIR user group.

It is understood that this participation does not include any financial contribution or any contractual or other obligation, but will be limited to provide support, advice and guidance to the project management and project members of the REPAIR Consortium. The REPAIR proposal will be submitted by 08-09-2015 under the H2020 Eco-innovative strategies WASTE-6b-2015 call.

 Associat

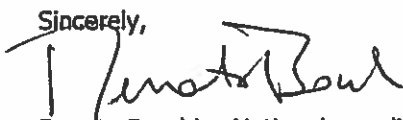
Members of the REPAIR User Group represent typical parties directly involved or interested in the results and deliverables of the REPAIR project due to their role in waste management and regional planning and design. The participation of this Group in REPAIR is essential for a successful completion and will be effected immediately after the start of the project. The REPAIR consortium recognizes the importance of the information and guidance provided by stakeholders and it is therefore the intention of the REPAIR consortium to involve the stakeholders on a case-by-case and bi-lateral basis in order to guarantee maximum confidentiality. At the same maximum effectiveness of the information exchange is provided. The member has access to the project knowledge under the agreement of confidentiality. The travel costs to the project meetings will be reimbursed by the project.

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- To participate in the evaluation of the final project results

It is the intention of the REPAIR consortium to share test results and elements of the scientific and technical evidence with individual stakeholders and as such provide stakeholders with an insight in the developed models, and decision support tools.

Sincerely,



Renato Bocchi National coordinator of the research network "Re-cycle Italy" – www.recycleitaly.it

Signature:

Place: Venice

Date: 26th August 2015

University of Lodz

UNIWERSYTET ŁÓDZKI
Wydział Nauk Geograficznych
Katedra Geografii Regionalnej i Społecznej
ul. Kopcińskiego 31, 90-142 Łódź

Faculty of Geographical Sciences

Department of Regional and Social Geography

31 Kopcińskiego st., 90-142 Łódź

georeg@geo.uni.lodz.pl, +48 42 6354586

HORIZON 2020 LETTER OF SUPPORT USER GROUP

Participation in the REPAIR User Group

On behalf of **University of Lodz** I hereby like to confirm our participation in the proposed REPAIR user group.

It is understood that this participation does not include any financial contribution or any contractual or other obligation, but will be limited to provide support, advice and guidance to the project management and project members of the REPAIR Consortium. The REPAIR proposal will be submitted by 08-09-2015 under the H2020 **Eco-innovative strategies WASTE-6b-2015 call**.

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- To participate in the evaluation of the final project results

It is the intention of the REPAIR consortium to share test results and elements of the scientific and technical evidence with individual stakeholders and as such provide stakeholders with an insight in the developed models, and decision support tools.

Sincerely,

University of Łódź

Faculty of Geographical Sciences
Department of Regional and Social Geography
31 Kopcińskiego st., 90-142 Łódź
georeg@geo.uni.lodz.pl, +48 42 6354586

Signature:



Karolina Dmochowska-Dudek

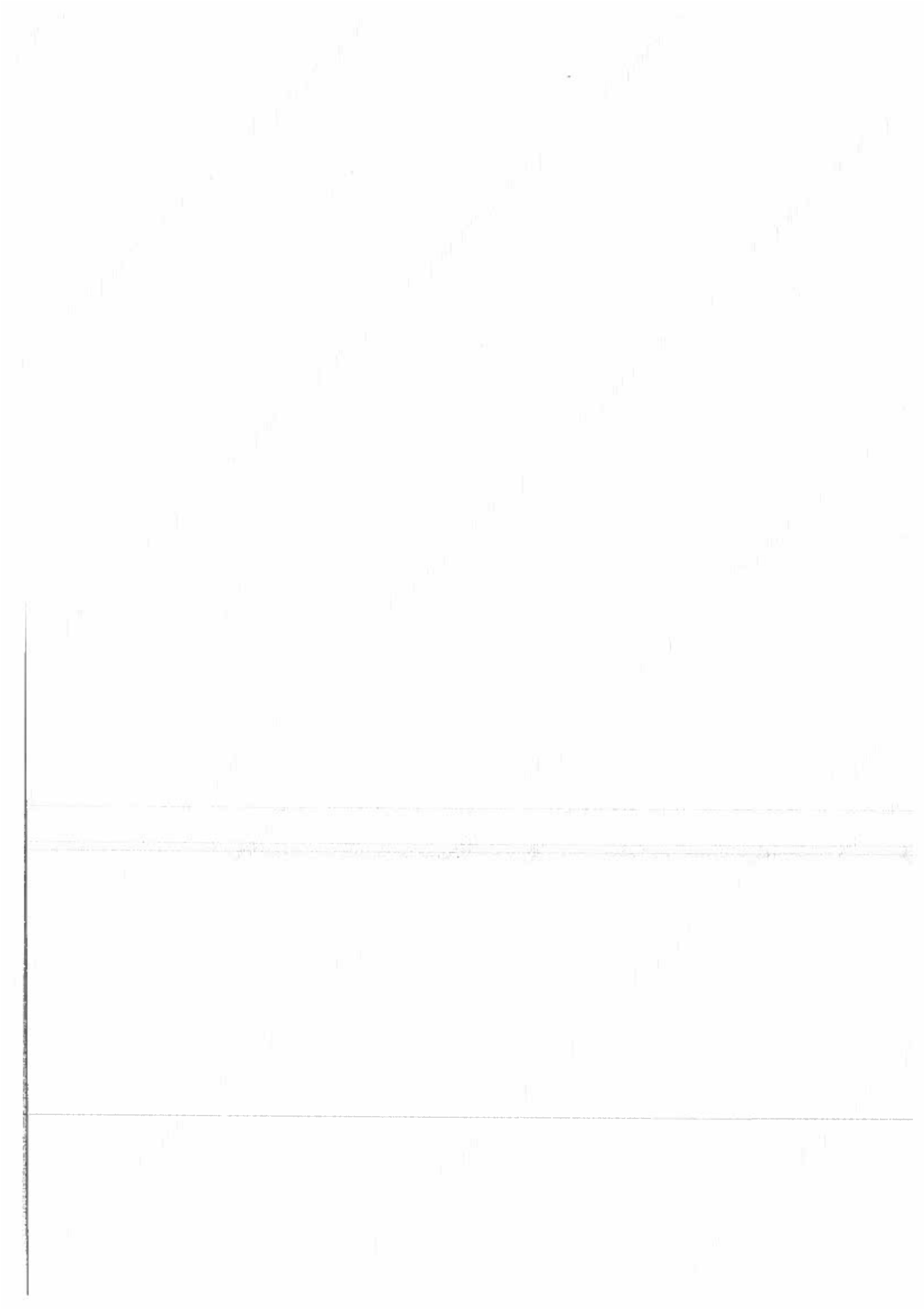
Place:

Łódź

Date:

29.06.2016

UNIwersytet Łódzki
Wydział Nauk Geograficznych
Katedra Geografii Regionalnej i Społecznej
ul. Kopcińskiego 31, 90-142 Łódź





IZBA ROLNICZA
WOJEWÓDZTWA ŁÓDZKIEGO

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interaktywnie

91- 420 Łódź, ul. Północna 27/29
☎ (0-42) 632 70 21 Tel/Fax 632 70 31
www.izbarolnicza.lodz.pl
e-mail: info@izbarolnicza.lodz.pl

HORIZON 2020 LETTER OF SUPPORT USER GROUP

Participation in the REPAIR User Group

On behalf of the Agricultural Chamber in Łódź Province, I hereby like to confirm our participation in the proposed REPAIR user group.

It is understood that this participation does not include any financial contribution or any contractual or other obligation, but will be limited to provide support, advice and guidance to the project management and project members of the REPAIR Consortium. The REPAIR proposal will be submitted by 08-09-2015 under the H2020 **Eco-innovative strategies WASTE-6b-2015 call**.

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- To join stakeholder workshops in order to test and further develop the software developed by REPAIR
- To provide direction and additional requirements as they deemed necessary
- To participate in the evaluation of the project results, such as progress reports, analysis of logistic processes
- To participate in the evaluation of the final project results

It is the intention of the REPAIR consortium to share test results and elements of the scientific and technical evidence with individual stakeholders and as such provide stakeholders with an insight in the developed models, and decision support tools.

Sincerely,

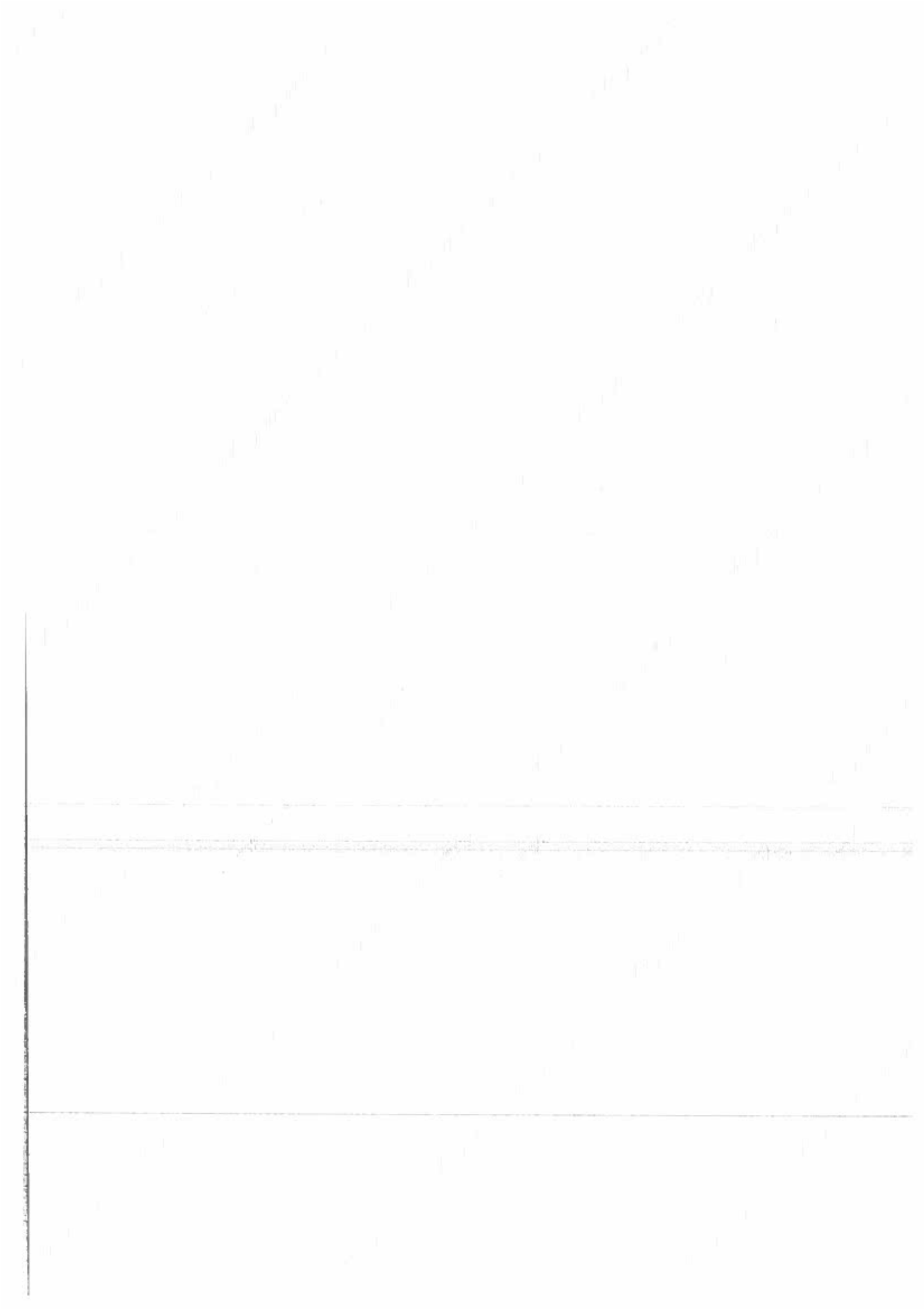
PREZES ZARZĄDU
Izby Rolniczej Województwa
Łódzkiego
Andrzej Góracyński
mgr inż. Andrzej Góracyński

Signature:

IZBA ROLNICZA
WOJEWÓDZTWA ŁÓDZKIEGO
91-420 Łódź, ul. Północna 27/29
tel. 42 632 70 21, tel/fax 42 632 70 31
KRP 72545-12 675 REG. 471558119

Łódź
Place:

25.06.2015
Date:



HORIZON 2020 LETTER OF SUPPORT USER GROUP

Participation in the REPAiR User Group

On behalf of Lodz Regional Development Agency, I hereby like to confirm our participation in the proposed REPAiR user group.

It is understood that this participation does not include any financial contribution or any contractual or other obligation, but will be limited to provide support, advice and guidance to the project management and project members of the REPAiR Consortium. The REPAiR proposal will be submitted by 08-09-2015 under the H2020 **Eco-innovative strategies WASTE-6b-2015 call**.

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- To participate in the evaluation of the project results, such as progress reports, analysis of logistic processes
- To participate in the evaluation of the final project results

It is the intention of the REPAiR consortium to share test results and elements of the scientific and technical evidence with individual stakeholders and as such provide stakeholders with an insight in the developed models, and decision support tools.

Sincerely,

Signature:

Przemysław Andrzejak

.....

Izabela Witaszek

Place: Lodz

Date: 30.06.2015





Freie und Hansestadt Hamburg Bezirksamt Altona

Bezirksamt Altona - Fachamt Stadt- und
Landschaftsplanung - 22758 Hamburg

Fachamt Stadt- und Landschaftsplanung
A/SL1 - Übergeordnete Planung

Jessenstraße 1 - 3
22767 Hamburg
Telefon 040 - 4 28 11 - 6014
Ansprechpartner: Frau Sabine Hilfert
Zimmer 517
Telefon 040 - 4 28 11 - 6016

E-Mail Sabine.Hilfert@altona.hamburg.de

Hamburg, den 31.07.2015

HORIZON 2020 LETTER OF SUPPORT USER GROUP Participation in the REPAiR User Group

On behalf of Bezirksamt Hamburg-Altona (Free and Hanseatic City of Hamburg - District of Altona), I hereby like to confirm our participation in the proposed REPAiR user group.

It is understood that this participation does not include any financial contribution or any contractual or other obligation, but will be limited to provide support, advice and guidance to the project management and project members of the REPAiR Consortium. The REPAiR proposal will be submitted by 08-09-2015 under the H2020 Eco-innovative strategies WASTE-6b-2015 call.

Members of the REPAiR User Group represent typical parties directly involved or interested in the results and deliverables of the REPAiR project due to their role in waste management and regional planning and design. The participation of this Group in REPAiR is essential for a successful completion and will be effected immediately after the start of the project. The REPAiR consortium recognizes the importance of the information and guidance provided by stakeholders and it is therefore the intention of the REPAiR consortium to involve the stakeholders on a case-by-case and bi-lateral basis in order to guarantee maximum confidentiality. At the same maximum effectiveness of the information exchange is provided. The member has access to the project knowledge under the agreement of confidentiality. The travel costs to the project meetings will be reimbursed by the project.

The members of this Group will have the following tasks (examples):

- To provide input and feedback on the roadmap which will draw a clear strategy and work plan to further the application of the technologies created, investigated and invented in the project>
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It is the intention of the REPAiR consortium to share test results and elements of the scientific and technical evidence with individual stakeholders and as such provide stakeholders with an insight in the developed models, and decision support tools.

Sincerely,

Sabine Hilfert, Hamburg, 31.07.15

HORIZON 2020 LETTER OF SUPPORT USER GROUP

Participation in the REPAIR User Group

On behalf of Staffordshire County Council I hereby like to confirm our participation in the proposed REPAIR user group.

It is understood that this participation does not include any financial contribution or any contractual or other obligation, but will be limited to provide support, advice and guidance to the project management and project members of the REPAIR Consortium. The REPAIR proposal will be submitted by 08-09-2015 under the H2020 **Eco-innovative strategies WASTE-6b-2015 call**.

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- To participate in the evaluation of the final project results

It is the intention of the REPAIR consortium to share test results and elements of the scientific and technical evidence with individual stakeholders and as such provide stakeholders with an insight in the developed models, and decision support tools.

Sincerely,

Signature:

E. Talbot

GROUP MANAGER, WASTE
& ENVIRONMENTAL
PROJECTS

Place:

STAFFORDSHIRE
COUNTY COUNCIL
PLACE 1

Date:

6/8/15

STIG ZLD



**BARANYA MEGYEI
KORMÁNYHIVATAL**

Ügyiratszám: BAB/10/2354 - 4 / 2015

Ügyintéző: Szabó Réka Kata

Telefon: (06-72) 507-087

Tárgy: Támogató nyilatkozat megküldése

Varjú Viktor
tudományos munkatárs részére
MTA KRTK Regionális Kutatási Intézete
Pécs
Papnövelde u. 22.
7621

Tisztelt Varjú Viktor Úr!

Hivatkozva 2015. június 24-én küldött megkeresésére, mellékelten küldöm a Baranya Megyei Kormányhivatal képviselőjében aláírt Támogató Nyilatkozatot.

Pécs, 2015. augusztus „3”.

Tisztelettel:




Dr. Horváth Zoltán
kormány megbízott

HORIZON 2020 LETTER OF SUPPORT USER GROUP

Participation in the REPAiR User Group

On behalf of the Government Office of Baranya County, I hereby like to confirm our participation in the proposed REPAiR user group.

It is understood that this participation does not include any financial contribution or any contractual or other obligation, but will be limited to provide support, advice and guidance to the project management and project members of the REPAiR Consortium. The REPAiR proposal will be submitted by 08-09-2015 under the H2020 Eco-innovative strategies WASTE-6b-2015 call.

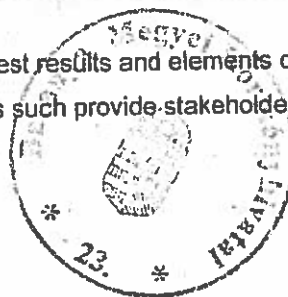
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- To provide direction and additional requirements as they deemed necessary
- To participate in the evaluation of the project results, such as progress reports, analysis of logistic processes
- To participate in the evaluation of the final project results

It is the intention of the REPAiR consortium to share test results and elements of the scientific and technical evidence with individual stakeholders and as such provide stakeholders with an insight in the developed models, and decision support tools.

Sincerely,




Dr. Horváth Zoltán

Pécs, 5 August 2015

kreis pinneberg

Der Landrat

HORIZON 2020 LETTER OF SUPPORT USER GROUP **Participation In the REPAIR User Group**

On behalf of the County of Pinneberg, I hereby like to confirm our participation in the proposed REPAIR user group.

It is understood that this participation does not include any financial contribution or any contractual or other obligation, but will be limited to provide support, advice and guidance to the project management and project members of the REPAIR Consortium. The REPAIR proposal will be submitted by 08-09-2015 under the H2020 **Eco-innovative strategies WASTE-6b-2015 call**.

Members of the REPAIR User Group represent typical parties directly involved or interested in the results and deliverables of the REPAIR project due to their role in waste management and regional planning and design. The participation of this Group in REPAIR is essential for a successful completion and will be effected immediately after the start of the project. The REPAIR consortium recognizes the importance of the information and guidance provided by stakeholders and it is therefore the intention of the REPAIR consortium to involve the stakeholders on a case-by-case and bi-lateral basis in order to guarantee maximum confidentiality. At the same maximum effectiveness of the information exchange is provided. The member has access to the project knowledge under the agreement of confidentiality. The travel costs to the project meetings will be reimbursed by the project.

The members of this Group will have the following tasks (examples):

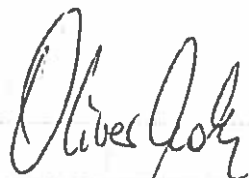
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It is the intention of the REPAiR consortium to share test results and elements of the scientific and technical evidence with individual stakeholders and as such provide stakeholders with an insight in the developed models, and decision support tools.

Sincerely,

Oliver Stolz
District Administrator

Signature:



Place: Elmshorn

Date: 17th July 2015

STAD GENT

**Research Group ENVOC
Ghent University
Coupure Links 653
9000 Ghent
Belgium**

contactpersoon
Joris Demoor
09/266.53.28

uw kenmerk

ons kenmerk

datum
16/04/2015

Letter of Support
concerning the "REPAIR project proposal

Correspondentieadres

Stadhuis
Botermarkt 1
9000 Gent
Tel. (09)266 50 00
Fax (09)266 50 19
E-mail burgemeester@gent.be
Internet <http://www.gent.be>

Bezoekadres

AC PORTUS
Keizer Karelstraat 1
9000 GENT

Tel. (09) 266 57 36
Fax (09) 266 56 29

Openingsuren

Elke werkdag 09.00 - 12.00 uur
14.00 - 16.00 uur

Bereikbaar

Trolleybus 3
Bus 16/17/18/19/38
(halte stadhuis)

Bus 5/50/52/53/54/55/57/57
(halte Sint-Jacobs)

Tram 1/10/11/12/13
(halte Korenmarkt)

Tram 40/41/42
(halte Sint-Baafsplein)

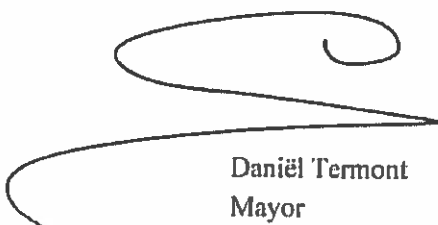
On behalf of the City of Ghent, I, the undersigned, hereby express our interest in acting as an observer of the activities of the network formed by the "Resource management in pri-urban rareas (REPAIR)" project. This proposal will be submitted in response to the Horizon 2020 call Waste-6b-2015-eco-innovative strategies.

The City of Ghent wishes to be kept informed about the REPAIR consortium's activities, and will participate in relevant workshops or seminars organized by this consortium.

This agreement is not intended and shall not be invoked to create a binding obligation to enter follow up agreements.

Yours Sincerely,


Paul Teerlinck
City manager


Daniël Termont
Mayor

HORIZON 2020 LETTER OF SUPPORT USER GROUP

Participation in the REPAiR User Group

On behalf of **STRDA South Transdanubian Regional Development Agency Nonprofit Ltd.**
(Address: 7621 Pécs, Mária u. 3., Hungary; represented by SITÁNYI László dr., executive; Community tax no.: HU 20145103; telephone: +36 72 513760; email: info@ddrfu.hu; web: ddrfu.hu), I hereby like to confirm our participation in the proposed REPAiR user group.

It is understood that this participation does not include any financial contribution or any contractual or other obligation, but will be limited to provide support, advice and guidance to the project management and project members of the REPAiR Consortium. The REPAiR proposal will be submitted by 08-09-2015 under the H2020 Eco-innovative strategies **WASTE-6b-2015 call**.

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It is the intention of the REPAiR consortium to share test results and elements of the scientific and technical evidence with individual stakeholders and as such provide stakeholders with an insight in the developed models, and decision support tools.

Sincerely,

Signature:



Place: Pécs

Date: 18 June 2015



Il Sindaco

HORIZON 2020 LETTER OF SUPPORT USER GROUP

Participation in the REPAIR User Group

On behalf of COMUNE DI NAPOLI, I hereby like to confirm our participation in the proposed REPAIR user group.

It is understood that this participation does not include any financial contribution or any contractual or other obligation, but will be limited to provide support, advice and guidance to the project management and project members of the REPAIR Consortium. The REPAIR proposal will be submitted by 08-09-2015 under the H2020 **Eco-Innovative strategies WASTE-6b-2015 call**.

Members of the REPAIR User Group represent typical parties directly involved or interested in the results and deliverables of the REPAIR project due to their role in waste management and regional planning and design. The participation of this Group in REPAIR is essential for a successful completion and will be effected immediately after the start of the project. The REPAIR consortium recognizes the importance of the information and guidance provided by stakeholders and it is therefore the intention of the REPAIR consortium to involve the stakeholders on a case-by-case and bi-lateral basis in order to guarantee maximum confidentiality. At the same maximum effectiveness of the information exchange is provided. The member has access to the project knowledge under the agreement of confidentiality. The travel costs to the project meetings will be reimbursed by the project.

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It is the intention of the REPAIR consortium to share test results and elements of the scientific and technical evidence with individual stakeholders and as such provide stakeholders with an insight in the developed models, and decision support tools.

Sincerely,

Signature: Luigi de Magistris, the Mayor

Place: NAPLES

Date: 01.09.2015



HORIZON 2020 LETTER OF SUPPORT USER GROUP
Participation in the REPAIR User Group



On behalf of AEB Amsterdam, I hereby like to confirm our participation in the proposed REPAIR user group.

It is understood that this participation does not include any financial contribution or any contractual or other obligation, but will be limited to provide support, advice and guidance to the project management and project members of the REPAIR Consortium. The REPAIR proposal will be submitted by 08-09-2015 under the H2020 **Eco-innovative strategies WASTE-6b-2015** call.

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Assoc

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It is the intention of the REPAIR consortium to share test results and elements of the scientific and technical evidence with individual stakeholders and as such provide stakeholders with an insight in the developed models, and decision support tools.

Sincerely,

Sietse A. Agema

Advisor of the board

Signature:

Place: Amsterdam

Date: 3 September 2015

From: [Girán János](#)
To: [Alexander Wandl - BK](#)
Subject: HORIZON 2020 LETTER OF SUPPORT USER GROUP
Date: vrijdag 4 september 2015 9:59:38

Participation in the REPAiR User Group

On behalf of the Municipality of Pécs, I hereby like to confirm our participation in the proposed REPAiR user group.

It is understood that this participation does not include any financial contribution or any contractual or other obligation, but will be limited to provide support, advice and guidance to the project management and project members of the REPAiR Consortium. The REPAiR proposal will be submitted by 08-09-2015 under the H2020 **Eco-innovative strategies WASTE-6b-2015 call**.

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It is the intention of the REPAiR consortium to share test results and elements of the scientific and technical evidence with individual stakeholders and as such provide stakeholders with an insight in the developed models, and decision support tools.

Sincerely,

Signature: Mr. Janos Giran, deputy-mayor

Place: Pécs, Hungary

Date: 04.09.2015.

Girán János PhD

first deputy mayor

Municipality of Pécs

HU-7621 Pécs, Széchenyi tér 1.

Office: 0672/533-819

Mobile: 0620/566-4095

Email: giran.janos@ph.pecs.hu

Web: www.pecs.hu

HORIZON 2020 LETTER OF SUPPORT USER GROUP

Participation in the REPAIR User Group

On behalf of EVOLV, ASU's Global Sustainability Solutions Services at Haarlemmermeer, I hereby like to confirm our participation in the proposed REPAIR user group.

It is understood that this participation does not include any financial contribution or any contractual or other obligation, but will be limited to provide support, advice and guidance to the project management and project members of the REPAIR Consortium. The REPAIR proposal will be submitted by 08-09-2015 under the H2020 **Eco-innovative strategies WASTE-6b-2015 call**.

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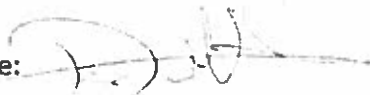
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It is the intention of the REPAIR consortium to share test results and elements of the scientific and technical evidence with individual stakeholders and as such provide stakeholders with an insight in the developed models, and decision support tools.

Sincerely,

F. J. DUKKENS

Signature:



Place: OEGSTIGLOST
NETHERLANDS

Date: 4 SEPT 2015



City of
Amsterdam

Associated with document Ref: (2016)1693984 - 11/04/2016

Weesperplein 8
1018 XA Amsterdam
The Netherlands

PO Box 2758
1000 CT Amsterdam
The Netherlands
Phone +31 20 624 1111
amsterdam.nl

Return to: PO Box 2758, 1000 CT Amsterdam, The Netherlands

TU Delft, Faculty of Architecture and the Built
Environment
Prof.dr.ir. Arjan van Timmeren
Chair of Environmental Technology & Design
Department of Urbanism
Postbus 5043
2600 GA Delft

Date 7 Septembre 2015
Our reference 15-832
Your reference
Dealt with by E. Jonkhoff, e.jonkhoff@amsterdam.nl, 06 2244 8370
Copy to E. Jonkhoff, A. Wiersma
Attachement
Subject Horizon 2020 Letter of Support User Group

HORIZON 2020 LETTER OF SUPPORT USER GROUP

Participation in the REPAiR User Group

On behalf of the City of Amsterdam, I hereby like to confirm our participation in the proposed REPAiR user group.

It is understood that this participation does not include any financial contribution or any contractual or other obligation, but will be limited to provide support, advice and guidance to the project management and project members of the REPAIR Consortium. The REPAIR proposal will be submitted by 08-09-2015 under the H2020 **Eco-innovative strategies WASTE-6b-2015 call**.

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ESTIMATED BUDGET FOR THE ACTION (page 2 of 2)

- (1) See Article 6 for the eligibility conditions
- (2) The indirect costs covered by the operating grant (received under any EU or Euratom funding programme; see Article 6.5 (b)) are ineligible under the GA. Therefore, a beneficiary that receives an operating grant during the action's duration cannot declare indirect costs for the year(s)/reporting period(s) covered by the operating grant (see Article 6.2 E)
- (3) This is the theoretical amount of EU contribution that the system calculates automatically (by multiplying all the budgeted costs by the reimbursement rate). This theoretical amount is capped by the 'maximum grant amount' (that the Commission/Agency decided to grant for the action) (see Article 3.1)
- (4) The 'maximum grant amount' is the maximum grant amount decided by the Commission/Agency. It normally corresponds to the requested grant, but may be lower
- (5) Depending on its type, this specific cost category will or will not cover indirect costs. Specific unit costs that include indirect costs are: costs for energy efficiency measures in buildings, access costs for providing trans-national access to research infrastructure and costs for clinical studies
- (6) See Article 5 for the forms of costs
- (7) Unit: hours worked on the action, costs per unit (hourly rate) calculated according to beneficiary's usual accounting practice
- (8) See Annex 2a 'Additional information on the estimated budget' for the details (costs per hour (hourly rate))
- (9) Flat rate: 25% of eligible direct costs, from which are excluded: direct costs of subcontracting, costs of in-kind contributions not used on premises, direct costs of financial support, and unit costs declared under budget category F if they include indirect costs
- (10) See Annex 2a 'Additional information on the estimated budget' for the details (units, costs per unit)
- (11) See Annex 2a 'Additional information on the estimated budget' for the details (units, costs per unit, estimated number of units, etc.)
- (12) Only specific unit costs that do not include indirect costs
- (13) See Article 9 for beneficiaries not receiving EU funding
- (14) Only for linked third parties that receive EU funding

ANNEX 2a

ADDITIONAL INFORMATION ON THE ESTIMATED BUDGET

1. Costs for a SME owner [GGR] that is not receiving a salary

Units: hours worked on the action

Amount per unit ('hourly rate')*:

- partner Max Bohnet: EUR 32,13
- partner Jens Martin Gutsche: EUR 32,13

$4650 \text{ €} * 98,8 \% \text{ coefficient for Germany} = 4594,20 \text{ €} (4590 \text{ €})$

Per hour: $4590 \text{ €} / 143 = 32,10 \text{ €}$

* Amount calculated as follows:

{[insert amount for MSC-IF living allowance of the Main Work Programme — MSCA in force at the time of the call] / 143 hours}

multiplied by

{country-specific correction coefficient of the country where the GGR is established}

Estimated number of units: $36,9 \text{ Monate} * 143 \text{ Stunden} = 5276,7 \text{ Stunden}$ see Annex 2

2. Costs for a SME owner [Geo-Col] that is not receiving a salary

Units: hours worked on the action

Amount per unit ('hourly rate')*:

- owner Gustavo Arciniegas: EUR [33,92]

$4650 \text{ €} * 104,3 \% \text{ coefficient for The Netherlands} = 4849,95 \text{ €}$

pro hour: $4849,95 \text{ €} / 143 = 33,92 \text{ €}$

* Amount calculated as follows:

{[insert amount for MSC-IF living allowance of the Main Work Programme — MSCA in force at the time of the call] / 143 hours}

multiplied by

{country-specific correction coefficient of the country where the Geo-Col is established}

Estimated number of units: $18,7 \text{ Monate} * 143 \text{ Stunden} = 2674,1 \text{ hours}$ see Annex 2

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

UNIVERSITEIT GENT (UGENT), 248015142, established in SINT PIETERSNIEUWSTRAAT 25, GENT 9000, Belgium, BE0248015142 ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become *beneficiary* No ('2')

in Grant Agreement No 688920 ('the Agreement')

between TECHNISCHE UNIVERSITEIT DELFT and *the Executive Agency for Small and Medium-sized Enterprises (EASME) ('the Agency')*, under the power delegated by the European Commission ('the Commission'),

for the action entitled 'REPAIR - REsource Management in Peri-urban AREas: Going Beyond Urban Metabolism (REPAIR)'.

and mandates

the *coordinator* to submit and sign in its name and on its behalf any **amendments to the Agreement, in accordance with Article 55.**

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement the grant in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

UNIVERSITA DEGLI STUDI DI NAPOLI FEDERICO II. (UNINA), D17903H4, established in Corso Umberto I 40, NAPOLI 80138, Italy, IT00876220633 ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become *beneficiary* No ('3')

in Grant Agreement No 688920 ('the Agreement')

between TECHNISCHE UNIVERSITEIT DELFT and the *Executive Agency for Small and Medium-sized Enterprises (EASME)* ('the Agency'), under the power delegated by the European Commission ('the Commission'),

for the action entitled 'REPAiR - REsource Management in Peri-urban AReas: Going Beyond Urban Metabolism (REPAiR)'.

and mandates

the *coordinator* to submit and sign in its name and on its behalf any **amendments to the Agreement, in accordance with Article 55.**

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement the grant in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

HAFENCITY UNIVERSITAT HAMBURG (HCU), NONE, established in UBERSEEALLEE 16, HAMBURG 20457, Germany, DE256502509 ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become *beneficiary* No ('4')

in Grant Agreement No 688920 ('the Agreement')

between TECHNISCHE UNIVERSITEIT DELFT and *the Executive Agency for Small and Medium-sized Enterprises (EASME) ('the Agency')*, under the power delegated by the European Commission ('the Commission'),

for the action entitled 'REPAiR - REsource Management in Peri-urban AREas: Going Beyond Urban Metabolism (REPAiR)'.

and mandates

the *coordinator* to submit and sign in its name and on its behalf any amendments to the Agreement, in accordance with Article 55.

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement the grant in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

MAGYAR TUDOMANYOS AKADEMIA KOZGAZDASAG- ES REGIONALIS TUDOMANYI KUTATOKOZPONT (RKI), 15300681722034202, established in PAPNOVELDE U 22, PECS 7621, Hungary, HU15300681 ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become *beneficiary* No ('5')

in Grant Agreement No 688920 ('the Agreement')

between TECHNISCHE UNIVERSITEIT DELFT and the *Executive Agency for Small and Medium-sized Enterprises (EASME)* ('the Agency'), under the power delegated by the European Commission ('the Commission'),

for the action entitled 'REPAiR - REsource Management in Peri-urban AREas: Going Beyond Urban Metabolism (REPAiR)'.

and mandates

the *coordinator* to submit and sign in its name and on its behalf any **amendments to the Agreement, in accordance with Article 55.**

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement the grant in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

INSTYTUT GEOGRAFII I PRZESTRZENNEGO ZAGOSPODAROWANIA IM STANISŁAWA LESZCZYCKIEGO POLSKIEJ AKADEMII NAUK (IGiPZ), 000325854, established in UL. TWARDA 51/55, WARSZAWA 00-818, Poland, PL5250012188 ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become *beneficiary* No ('6')

in Grant Agreement No 688920 ('the Agreement')

between TECHNISCHE UNIVERSITEIT DELFT and *the Executive Agency for Small and Medium-sized Enterprises (EASME)* ('the Agency'), under the power delegated by the European Commission ('the Commission'),

for the action entitled 'REPAiR - REsource Management in Peri-urban AREas: Going Beyond Urban Metabolism (REPAiR)'.

and mandates

the *coordinator* to submit and sign in its name and on its behalf any **amendments to the Agreement, in accordance with Article 55.**

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement the grant in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

ARCINIEGAS LOPEZ GUSTAVO (Geo-Col), 60965452, established in MARCO POLOSTRAAT 218-2, AMSTERDAM 1057XA, Netherlands, NL252240704B01 ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become *beneficiary* No ('8')

in Grant Agreement No 688920 ('the Agreement')

between TECHNISCHE UNIVERSITEIT DELFT and *the Executive Agency for Small and Medium-sized Enterprises (EASME) ('the Agency')*, under the power delegated by the European Commission ('the Commission'),

for the action entitled 'REPAiR - REsource Management in Peri-urban AREas: Going Beyond Urban Metabolism (REPAiR)'.

and mandates

the *coordinator* to submit and sign in its name and on its behalf any **amendments to the Agreement, in accordance with Article 55.**

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement the grant in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

DELTA PROJECTONTWIKKELING BV (Delta) BV, 23088605, established in BINNEN KALKHAVEN 39, DORDRECHT 3311 JC, Netherlands, NL806587751B01 ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become *beneficiary* No ('9')

in Grant Agreement No 688920 ('the Agreement')

between TECHNISCHE UNIVERSITEIT DELFT and the Executive Agency for Small and Medium-sized Enterprises (EASME) ('the Agency'), under the power delegated by the European Commission ('the Commission'),

for the action entitled 'REPAIR - REsource Management in Peri-urban AREas: Going Beyond Urban Metabolism (REPAIR)'.

and mandates

the *coordinator* to submit and sign in its name and on its behalf any **amendments to the Agreement, in accordance with Article 55.**

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement the grant in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

BIOKOM Pecs Varosuzemeltetesi es Kornyezetgazdalkodasi Nonprofit Korlatolt Felelossegu Tarsasag (BIOKOM) HU11, 0209062862, established in Siklosi ut 52, Pecs 7632, Hungary, HU11014959 ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become *beneficiary* No ('10')

in Grant Agreement No 688920 ('the Agreement')

between TECHNISCHE UNIVERSITEIT DELFT and *the Executive Agency for Small and Medium-sized Enterprises (EASME) ('the Agency'), under the power delegated by the European Commission ('the Commission')*,

for the action entitled 'REPAiR - REsource Management in Peri-urban AREas: Going Beyond Urban Metabolism (REPAiR)'.

and mandates

the *coordinator* to submit and sign in its name and on its behalf any **amendments to the Agreement, in accordance with Article 55.**

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement the grant in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

Gertz Gutsche Rümenapp - Stadtentwicklung und Mobilität GbR (GGR) GBR, 4162202613, established in Ruhrstraße 11, Hamburg 22761, Germany, DE232599881 ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become *beneficiary* No ('11')

in Grant Agreement No 688920 ('the Agreement')

between TECHNISCHE UNIVERSITEIT DELFT **and** *the Executive Agency for Small and Medium-sized Enterprises (EASME)* ('the Agency'), under the power delegated by the European Commission ('the Commission'),

for the action entitled 'REPAiR - REsource Management in Peri-urban AREas: Going Beyond Urban Metabolism (REPAiR)'.

and mandates

the *coordinator* to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 55.

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement the grant in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

OPENBARE VLAAMSE AFVALSTOFFENMAATSCHAPPIJ (OVAM), 0842399963, established in STATIONSSTRAAT 110, MECHELEN 2800, Belgium, BE ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become *beneficiary* No ('12')

in Grant Agreement No 688920 ('the Agreement')

between TECHNISCHE UNIVERSITEIT DELFT and *the Executive Agency for Small and Medium-sized Enterprises (EASME) ('the Agency')*, under the power delegated by the European Commission ('the Commission'),

for the action entitled 'REPAiR - REsource Management in Peri-urban AREas: Going Beyond Urban Metabolism (REPAiR)'.

and mandates

the *coordinator* to submit and sign in its name and on its behalf any **amendments to the Agreement, in accordance with Article 55.**

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement the grant in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

GEMEENTE HAARLEMMERMEER (GHM), 34366641, established in RAADHUISPLEIN 1, HOOFDORF 2130 AG, Netherlands, NL001708879B01 ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become *beneficiary* No ('13')

in Grant Agreement No 688920 ('the Agreement')

between TECHNISCHE UNIVERSITEIT DELFT and the Executive Agency for Small and Medium-sized Enterprises (EASME) ('the Agency'), under the power delegated by the European Commission ('the Commission'),

for the action entitled 'REPAiR - REsource Management in Peri-urban AREas: Going Beyond Urban Metabolism (REPAiR)'.

and mandates

the *coordinator* to submit and sign in its name and on its behalf any **amendments to the Agreement, in accordance with Article 55.**

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement the grant in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

REGIONE CAMPANIA (CAMPANIA), Italian constitution act of 1.1.1948 art 131, established in VIA S. LUCIA 81, NAPOLI 80132, Italy, IT80011990639 ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become *beneficiary* No ('14')

in Grant Agreement No 688920 ('the Agreement')

between TECHNISCHE UNIVERSITEIT DELFT and *the Executive Agency for Small and Medium-sized Enterprises (EASME) ('the Agency'), under the power delegated by the European Commission ('the Commission')*,

for the action entitled 'REPAiR - REsource Management in Peri-urban AREas: Going Beyond Urban Metabolism (REPAiR)'.

and mandates

the *coordinator* to submit and sign in its name and on its behalf any amendments to the Agreement, in accordance with Article 55.

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement the grant in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

OLP SPOLKA Z OGRANICZONA ODPOWIEDZILNOSCIA (PHH) SP(ZOO), 361282378, established in UL GABRIELA NARUTOWICZA 34, LODZ 90 135, Poland, PL7252084980 ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become *beneficiary* No ('15')

in Grant Agreement No 688920 ('the Agreement')

between TECHNISCHE UNIVERSITEIT DELFT and the Executive Agency for Small and Medium-sized Enterprises (EASME) ('the Agency'), under the power delegated by the European Commission ('the Commission'),

for the action entitled 'REPAiR - REsource Management in Peri-urban AREas: Going Beyond Urban Metabolism (REPAiR)'.

and mandates

the *coordinator* to submit and sign in its name and on its behalf any amendments to the Agreement, in accordance with Article 55.

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement the grant in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

BAUER UMWELT GMBH (BAUER) GMBH, 101124, established in In der Scherau, 1, SCHROBENHAUSEN 86529, Germany, DE814453909 ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become *beneficiary* No ('16')

in Grant Agreement No 688920 ('the Agreement')

between TECHNISCHE UNIVERSITEIT DELFT and *the Executive Agency for Small and Medium-sized Enterprises (EASME) ('the Agency')*, under the power delegated by the European Commission ('the Commission'),

for the action entitled 'REPAiR - REsource Management in Peri-urban AREas: Going Beyond Urban Metabolism (REPAiR)'.

and mandates

the *coordinator* to submit and sign in its name and on its behalf any **amendments to the Agreement, in accordance with Article 55.**

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement the grant in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

INTERGEMEENTELIJKE VERENIGING VOORAFVALBEHEER IN GENT EN OMSTREKEN (IVAGO) BE30, 252828916, established in BOTERMARKT 1, GENT 9000, Belgium, BE0252828916 ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become *beneficiary* No ('17')

in Grant Agreement No 688920 ('the Agreement')

between TECHNISCHE UNIVERSITEIT DELFT and *the Executive Agency for Small and Medium-sized Enterprises (EASME) ('the Agency')*, under the power delegated by the European Commission ('the Commission'),

for the action entitled 'REPAiR - REsource Management in Peri-urban AREas: Going Beyond Urban Metabolism (REPAiR)'.

and mandates

the *coordinator* to submit and sign in its name and on its behalf any **amendments to the Agreement, in accordance with Article 55.**

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement the grant in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

STADTREINIGUNG HAMBURG AOR (SRH), HRA118369, established in BULLERDEICH 19, HAMBURG 20537, Germany, DE811657326 ('the beneficiary'), represented for the purpose of signing this Accession Form by the undersigned,

hereby agrees

to become *beneficiary* No ('18')

in Grant Agreement No 688920 ('the Agreement')

between TECHNISCHE UNIVERSITEIT DELFT and *the Executive Agency for Small and Medium-sized Enterprises (EASME) ('the Agency')*, under the power delegated by the European Commission ('the Commission'),

for the action entitled 'REPAIR - REsource Management in Peri-urban AREas: Going Beyond Urban Metabolism (REPAIR)'.

and mandates

the *coordinator* to submit and sign in its name and on its behalf any **amendments to the Agreement, in accordance with Article 55.**

By signing this Accession Form, the beneficiary accepts the grant and agrees to implement the grant in accordance with the Agreement, with all the obligations and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3b

ADMINISTRATIVE ARRANGEMENT WITH THE JOINT RESEARCH CENTRE (JRC)

This Administrative Arrangement is between the following parties:

on the one part,

the Executive Agency for Small and Medium-sized Enterprises ('the Agency'), under the power delegated by the European Commission ('the Commission'), represented by Head of Unit, Executive Agency for Small and Medium-sized Enterprises (EASME) H2020 Environment & Resources, Arnoldas MILUKAS,¹

and

on the other part,

the Joint Research Centre (JRC), represented by the Director of the Institute for Environment and Sustainability.

By signing this Administrative Arrangement, the parties agree to consider the JRC as beneficiary in Grant Agreement No 688920 ('the Agreement') between TECHNISCHE UNIVERSITEIT DELFT (TUD) and the Executive Agency for Small and Medium-sized Enterprises (EASME) ('the Agency'), under the power delegated by the European Commission ('the Commission'), for the action entitled "REPAiR - REsource Management in Peri-urban AREas: Going Beyond Urban Metabolism (REPAiR)"

By signing this Administrative Arrangement, the JRC accepts the grant and agrees to implement the action, as specified in Annex 1 of the Grant Agreement, under its own responsibility and in accordance with the Grant Agreement, with all the obligations and conditions it sets out.

The Grant Agreement contains the following specificities for the JRC:

- the JRC becomes part of the Grant Agreement not via an accession form but via an administrative arrangement (preamble);
- the JRC is considered a 'beneficiary' (preamble);
- the periodic financial report must contain information on the amount of each interim payment and payment of the balance to be paid by the Commission to the JRC (Article 20.3), and

¹ The person representing the Agency must be an authorising officer (by delegation or sub-delegation) designated in accordance with document 60008 of 22.02.2001 'Mise en place de la Charte des ordonnateurs'.

- the part of the pre-financing payment related to the JRC is not paid to the coordinator, but kept by the Commission or Agency for the JRC (Article 21.2).

In addition to these specificities, the parties agree:

1. Start of participation

The JRC will assume rights and obligations under the Grant Agreement with effect from *the date of entry into force of the Grant Agreement*.

2. Estimated budget

As set out in Annex 2 of the Grant Agreement, the estimated eligible costs of the action for the JRC are EUR 425,167.50 (*four hundred and twenty five thousand one hundred and sixty seven EURO and fifty eurocents*).

3. Payments

Payments will be transferred according to the Commission's accounting rules on internal invoicing and will be made from the operational budget line of the *Executive Agency for Small and Medium-sized Enterprises* to the Legal Entity File (LEF) number of the JRC, mentioning the Recovery Order (RO) number. The JRC will submit a debit note for each payment (including the pre-financing).

The *Executive Agency for Small and Medium-sized Enterprises* will make the following payments (see Articles 20.3 (b) and 21.2 of the Grant Agreement) to the JRC:

- (i) a pre-financing payment of EUR 184,239.25 (*one hundred and eighty four thousand two hundred and thirty nine EURO and twenty five eurocents*), within 30 days from the submission of a debit note from the JRC after the signature of the Administrative Arrangement.

The JRC agrees that the amount of EUR 21,258.38 (*twenty one thousand two hundred and fifty eight EURO and thirty eight eurocents*), corresponding to its contribution to the Guarantee Fund (see Article 21.2 of the Grant Agreement), is transferred in its name by the *Executive Agency for Small and Medium-sized Enterprises* to the Guarantee Fund;

- (ii) interim payments and payment of the balance (see Article 21.3 and 21.4 of the Grant Agreement).

4. Late payment interest

There will be no late-payment interest for delays in payments between the JRC and the *Executive Agency for Small and Medium-sized Enterprises*.

5. Audit certificates

The JRC Internal Audit Unit will act as the competent public officer for providing the required certificates in line with Articles 20.4 and 18.1.2 of the Grant Agreement.

6. Communications between the parties

Communications between the *Executive Agency for Small and Medium-sized Enterprises* and the JRC must be made in accordance with Article 52 of the Grant Agreement.

7. Amendments

Any modification to the Administrative Arrangement will be signed in the electronic exchange system (see Articles 52 and 55 of the Grant Agreement).

8. Interpretation

If the Grant Agreement conflicts with any provision of the Administrative Arrangement with regard to relations between the *Executive Agency for Small and Medium-sized Enterprises* and the JRC, the latter will prevail.

9. Termination

If the Grant Agreement is terminated (see Article 50.1 or 50.3 of the Grant Agreement), this Administrative Arrangement will terminate automatically in parallel with the Grant Agreement.

If the participation of the JRC is terminated (see Article 50.2 or 50.3 of the Grant Agreement), the Administrative Arrangement will be terminated under the conditions set out in the Grant Agreement — *mutatis mutandis*.

10. Entry into force

The Administrative Arrangement will enter into force on the day of signature by the *Executive Agency for Small and Medium-sized Enterprises* or the JRC, depending on which is later.

SIGNATURES

For the *Executive Agency for Small and Medium-sized Enterprises*

For the JRC

Print format: 44
beneficiary

MODEL ANNEX 4 FOR H2020 GENERAL MGA — MULTI

FINANCIAL STATEMENT FOR [BENEFICIARY (name)/ LINKED THIRD PARTY (name)]

Eligible costs (per budget category)										Receipts		EU contribution		Additional information
A. Direct personnel costs		B. Direct costs of subcontracting	C. Direct costs of in-scope support	D. Other direct costs		E. Indirect costs	F. Costs of ...		Total costs	Receipts	Reimbursement rate %	Maximum EU contribution	Requested EU contribution	
A.1 SME owners without salary				D.1 Travel			F.1 Costs of ...			Receipts of the action to be reported in the last reporting period, according to Article 5.3.3				
A.2 Natural persons under direct contract				D.2 Equipment										
A.3 Seconded persons				D.3 Other goods and services										
A.6 Personnel for providing access to research infrastructure														
A.4 SME owners without salary				D.4 Other direct costs										
A.5 Beneficiaries that are natural persons without salary														
A.6 Personnel for providing access to research infrastructure														
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The beneficiary/linked third party hereby confirms that:
The information provided is complete, reliable and true.
The costs declared are eligible (see Article 6).
The costs can be substantiated by adequate records and supporting documentation that will be produced upon request or in the context of checks, reviews, audits and investigations (see Articles 17, 18 and 22).
For the last reporting period, that all the receipts have been declared (see Article 5.3.3).

1 Please declare all eligible costs, even if they exceed the amounts indicated in the estimated budget (see Annex 2). Only amounts that were declared in your individual financial statements can be taken into account later on, in order to replace other costs that are found to be ineligible.

2 See Article 6 for the eligibility conditions.

3 The indirect costs claimed must be free of any amounts covered by an operating grant (received under any EU or Euratom funding programme: see Article 6.2 E). If you have received an operating grant during this reporting period, you cannot claim any indirect costs.

4 This is the theoretical amount of EU contribution that the system calculates automatically (by multiplying the reimbursement rate by the total costs declared). The amount you request (in the column 'requested EU contribution') may have to be less (e.g. if you and the other beneficiaries are above budget, if the 90% limit (see Article 21) is reached, etc).

5 See Article 5 for the form of costs.

6 Flat rate: 25% of eligible direct costs, from which are excluded: direct costs of subcontracting, costs of in-kind contributions not used on premises, direct costs of financial support, and unit costs declared under budget category F (if they include indirect costs) (see Article 6.2 E).

7 Only specific unit costs that do not include indirect costs.

H2020 Model Grant Agreements: H2020 General MGA — Multi: September 2014

ANNEX 5

MODEL FOR THE CERTIFICATE ON THE FINANCIAL STATEMENTS

- For options [*in italics in square brackets*]: choose the applicable option. Options not chosen should be deleted.
- For fields in [grey in square brackets]: enter the appropriate data

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H2020 Model Grant Agreements: H2020 General MGA — Multi: September 2014

Terms of Reference for an Independent Report of Factual Findings on costs declared under a Grant Agreement financed under the Horizon 2020 Research and Innovation Framework Programme

This document sets out the 'Terms of Reference (ToR)' under which

[OPTION 1: [insert name of the beneficiary] ('the Beneficiary')] [OPTION 2: [insert name of the linked third party] ('the Linked Third Party'), third party linked to the Beneficiary [insert name of the beneficiary] ('the Beneficiary')]

agrees to engage

[insert legal name of the auditor] ('the Auditor')

to produce an independent report of factual findings ('the Report') concerning the Financial Statement(s)¹ drawn up by the *[Beneficiary] [Linked Third Party]* for the Horizon 2020 grant agreement [insert number of the grant agreement, title of the action, acronym and duration from/to] ('the Agreement'), and

to issue a Certificate on the Financial Statements' ('CFS') referred to in Article 20.4 of the Agreement based on the compulsory reporting template stipulated by the Commission.

The Agreement has been concluded under the Horizon 2020 Research and Innovation Framework Programme (H2020) between the Beneficiary and *[OPTION 1: the European Union, represented by the European Commission ('the Commission')][OPTION 2: the European Atomic Energy Community (Euratom,) represented by the European Commission ('the Commission')][OPTION 3: the [Research Executive Agency (REA)] [European Research Council Executive Agency (ERCEA)] [Innovation and Networks Executive Agency (INEA)] [Executive Agency for Small and Medium-sized Enterprises (EASME)] ('the Agency'), under the powers delegated by the European Commission ('the Commission').]*

¹ By which costs under the Agreement are declared (see template 'Model Financial Statements' in Annex 4 to the Grant Agreement).

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The *[Commission]* *[Agency]* is mentioned as a signatory of the Agreement with the Beneficiary only.
The *[European Union]**[Euratom]**[Agency]* is not a party to this engagement.

1.1 Subject of the engagement

The coordinator must submit to the *[Commission]**[Agency]* the final report within 60 days following the end of the last reporting period which should include, amongst other documents, a CFS for each beneficiary and for each linked third party that requests a total contribution of EUR 325 000 or more, as reimbursement of actual costs and unit costs calculated on the basis of its usual cost accounting practices (see Article 20.4 of the Agreement). The CFS must cover all reporting periods of the beneficiary or linked third party indicated above.

The Beneficiary must submit to the coordinator the CFS for itself and for its linked third party(ies), if the CFS must be included in the final report according to Article 20.4 of the Agreement..

The CFS is composed of two separate documents:

- The Terms of Reference ('the ToR') to be signed by the *[Beneficiary]* *[Linked Third Party]* and the Auditor;
- The Auditor's Independent Report of Factual Findings ('the Report') to be issued on the Auditor's letterhead, dated, stamped and signed by the Auditor (or the competent public officer) which includes the agreed-upon procedures ('the Procedures') to be performed by the Auditor, and the standard factual findings ('the Findings') to be confirmed by the Auditor.

If the CFS must be included in the final report according to Article 20.4 of the Agreement, the request for payment of the balance relating to the Agreement cannot be made without the CFS. However, the payment for reimbursement of costs covered by the CFS does not preclude the *[Commission]*,*[Agency]*, the European Anti-Fraud Office and the European Court of Auditors from carrying out checks, reviews, audits and investigations in accordance with Article 22 of the Agreement.

1.2 Responsibilities

The *[Beneficiary]* *[Linked Third Party]*:

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- must draw up the Financial Statement(s) for the action financed by the Agreement in compliance with the obligations under the Agreement. The Financial Statement(s) must be drawn up according to the *[Beneficiary's] [Linked Third Party's]* accounting and book-keeping system and the underlying accounts and records;
- must send the Financial Statement(s) to the Auditor;
- is responsible and liable for the accuracy of the Financial Statement(s);
- is responsible for the completeness and accuracy of the information provided to enable the Auditor to carry out the Procedures. It must provide the Auditor with a written representation letter supporting these statements. The written representation letter must state the period covered by the statements and must be dated;
- accepts that the Auditor cannot carry out the Procedures unless it is given full access to the *[Beneficiary's] [Linked Third Party's]* staff and accounting as well as any other relevant records and documentation.

The Auditor:

- *[Option 1 by default: is qualified to carry out statutory audits of accounting documents in accordance with Directive 2006/43/EC of the European Parliament and of the Council of 17 May 2006 on statutory audits of annual accounts and consolidated accounts, amending Council Directives 78/660/EEC and 83/349/EEC and repealing Council Directive 84/253/EEC or similar national regulations].*
- *[Option 2 if the Beneficiary or Linked Third Party has an independent Public Officer: is a competent and independent Public Officer for which the relevant national authorities have established the legal capacity to audit the Beneficiary].*
- *[Option 3 if the Beneficiary or Linked Third Party is an international organisation: is an [internal] [external] auditor in accordance with the internal financial regulations and procedures of the international organisation].*

The Auditor:

- must be independent from the Beneficiary *[and the Linked Third Party]*, in particular, it must not have been involved in preparing the *[Beneficiary's] [Linked Third Party's]* Financial Statement(s);
- must plan work so that the Procedures may be carried out and the Findings may be assessed;
- must adhere to the Procedures laid down and the compulsory report format;
- must carry out the engagement in accordance with this ToR;
- must document matters which are important to support the Report;
- must base its Report on the evidence gathered;
- must submit the Report to the *[Beneficiary] [Linked Third Party]*.

The Commission sets out the Procedures to be carried out by the Auditor. The Auditor is not responsible for their suitability or pertinence. As this engagement is not an assurance engagement, the Auditor does not provide an audit opinion or a statement of assurance.

1.3 Applicable Standards

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The Auditor must comply with these Terms of Reference and with²:

- the International Standard on Related Services ('ISRS') 4400 *Engagements to perform Agreed-upon Procedures regarding Financial Information* as issued by the International Auditing and Assurance Standards Board (IAASB);
- the *Code of Ethics for Professional Accountants* issued by the International Ethics Standards Board for Accountants (IESBA). Although ISRS 4400 states that independence is not a requirement for engagements to carry out agreed-upon procedures, the [Commission][Agency] requires that the Auditor also complies with the Code's independence requirements.

The Auditor's Report must state that there is no conflict of interests in establishing this Report between the Auditor and the Beneficiary *[and the Linked Third Party]*, and must specify - if the service is invoiced - the total fee paid to the Auditor for providing the Report.

1.4 Reporting

The Report must be written in the language of the Agreement (see Article 20.7).

Under Article 22 of the Agreement, the [Commission] [Agency], the European Anti-Fraud Office and the Court of Auditors have the right to audit any work that is carried out under the action and for which costs are declared from *[the European Union]* *[Euratom]* budget. This includes work related to this engagement. The Auditor must provide access to all working papers (e.g. recalculation of hourly rates, verification of the time declared for the action) related to this assignment if the [Commission] [Agency], the European Anti-Fraud Office or the European Court of Auditors requests them.

1.5 Timing

The Report must be provided by *[dd Month yyyy]*.

² Supreme Audit Institutions applying INTOSAI-standards may carry out the Procedures according to the corresponding International Standards of Supreme Audit Institutions and code of ethics issued by INTOSAI instead of the International Standard on Related Services ('ISRS') 4400 and the Code of Ethics for Professional Accountants issued by the IAASB and the IESBA.

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1.6 Other terms

[The [Beneficiary] [Linked Third Party] and the Auditor can use this section to agree other specific terms, such as the Auditor's fees, liability, applicable law, etc. Those specific terms must not contradict the terms specified above.]

[legal name of the Auditor]

[legal name of the [Beneficiary]][Linked Third Party]]

[name & function of authorised representative][name & function of authorised representative]

[dd Month yyyy]

[dd Month yyyy]

Signature of the Auditor

Signature of the [Beneficiary]][Linked Third Party]

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Independent Report of Factual Findings on costs declared under Horizon 2020 Research and Innovation Framework Programme

(To be printed on the Auditor's letterhead)

To

[name of contact person(s)], [Position]

[{Beneficiary's} [Linked Third Party's] name]

[Address]

[dd Month yyyy]

Dear [Name of contact person(s)],

As agreed under the terms of reference dated [dd Month yyyy]

with [OPTION 1: [insert name of the beneficiary] ('the Beneficiary')] [OPTION 2: [insert name of the linked third party] ('the Linked Third Party'), third party linked to the Beneficiary [insert name of the beneficiary] ('the Beneficiary')],

we

[name of the auditor] ('the Auditor'),

established at

[full address/city/state/province/country],

represented by

[name and function of an authorised representative],

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have carried out the procedures agreed with you regarding the costs declared in the Financial Statement(s)³ of the [Beneficiary] [Linked Third Party] concerning the grant agreement

[insert grant agreement reference: number, title of the action and acronym] ('the Agreement'),

with a total cost declared of

[total amount] EUR,

and a total of actual costs and 'direct personnel costs declared as unit costs calculated in accordance with the [Beneficiary's] [Linked Third Party's] usual cost accounting practices' declared of

[sum of total actual costs and total direct personnel costs declared as unit costs calculated in accordance with the [Beneficiary's] [Linked Third Party's] usual cost accounting practices] EUR

and hereby provide our Independent Report of Factual Findings ('the Report') using the compulsory report format agreed with you.

The Report

Our engagement was carried out in accordance with the terms of reference ('the ToR') appended to this Report. The Report includes the agreed-upon procedures ('the Procedures') carried out and the standard factual findings ('the Findings') examined.

The Procedures were carried out solely to assist the [Commission] [Agency] in evaluating whether the [Beneficiary's] [Linked Third Party's] costs in the accompanying Financial Statement(s) were declared in accordance with the Agreement. The [Commission] [Agency] draws its own conclusions from the Report and any additional information it may require.

³ By which the Beneficiary declares costs under the Agreement (see template 'Model Financial Statement' in Annex 4 to the Agreement).

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The scope of the Procedures was defined by the Commission. Therefore, the Auditor is not responsible for their suitability or pertinence. Since the Procedures carried out constitute neither an audit nor a review made in accordance with International Standards on Auditing or International Standards on Review Engagements, the Auditor does not give a statement of assurance on the Financial Statements.

Had the Auditor carried out additional procedures or an audit of the [Beneficiary's] [Linked Third Party's] Financial Statements in accordance with International Standards on Auditing or International Standards on Review Engagements, other matters might have come to its attention and would have been included in the Report.

Not applicable Findings

We examined the Financial Statement(s) stated above and considered the following Findings not applicable:

Explanation (to be removed from the Report):

If a Finding was not applicable, it must be marked as 'N.A.' ('Not applicable') in the corresponding row on the right-hand column of the table and means that the Finding did not have to be corroborated by the Auditor and the related Procedure(s) did not have to be carried out.

The reasons of the non-application of a certain Finding must be obvious i.e.

- i) if no cost was declared under a certain category then the related Finding(s) and Procedure(s) are not applicable;*
- ii) if the condition set to apply certain Procedure(s) are not met the related Finding(s) and those Procedure(s) are not applicable. For instance, for 'beneficiaries with accounts established in a currency other than euro' the Procedure and Finding related to 'beneficiaries with accounts established in euro' are not applicable. Similarly, if no additional remuneration is paid, the related Finding(s) and Procedure(s) for additional remuneration are not applicable.*

List here all Findings considered not applicable for the present engagement and explain the reasons of the non-applicability.

....

Exceptions

Apart from the exceptions listed below, the [Beneficiary] [Linked Third Party] provided the Auditor all the documentation and accounting information needed by the Auditor to carry out the requested Procedures and evaluate the Findings.

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Explanation (to be removed from the Report):

- *If the Auditor was not able to successfully complete a procedure requested, it must be marked as 'E' ('Exception') in the corresponding row on the right-hand column of the table. The reason such as the inability to reconcile key information or the unavailability of data that prevents the Auditor from carrying out the Procedure must be indicated below.*
- *If the Auditor cannot corroborate a standard finding after having carried out the corresponding procedure, it must also be marked as 'E' ('Exception') and, where possible, the reasons why the Finding was not fulfilled and its possible impact must be explained here below.*

List here any exceptions and add any information on the cause and possible consequences of each exception, if known. If the exception is quantifiable, include the corresponding amount.

....

Example (to be removed from the Report):

1. *The Beneficiary was unable to substantiate the Finding number 1 on ... because*
2. *Finding number 30 was not fulfilled because the methodology used by the Beneficiary to calculate unit costs was different from the one approved by the Commission. The differences were as follows: ...*
3. *After carrying out the agreed procedures to confirm the Finding number 31, the Auditor found a difference of _____ EUR. The difference can be explained by ...*

Further Remarks

In addition to reporting on the results of the specific procedures carried out, the Auditor would like to make the following general remarks:

Example (to be removed from the Report):

1. *Regarding Finding number 8 the conditions for additional remuneration were considered as fulfilled because ...*
2. *In order to be able to confirm the Finding number 15 we carried out the following additional procedures:*

Use of this Report

This Report may be used only for the purpose described in the above objective. It was prepared solely for the confidential use of the [Beneficiary] [Linked Third Party] and the [Commission] [Agency], and only to be submitted to the [Commission] [Agency] in connection with the requirements set out in Article 20.4 of the Agreement. The Report may not be used by the [Beneficiary] [Linked Third Party] or by the [Commission] [Agency] for any other purpose, nor may it

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be distributed to any other parties. The [Commission] [Agency] may only disclose the Report to authorised parties, in particular to the European Anti-Fraud Office (OLAF) and the European Court of Auditors.

This Report relates only to the Financial Statement(s) submitted to the [Commission] [Agency] by the [Beneficiary] [Linked Third Party] for the Agreement. Therefore, it does not extend to any other of the [Beneficiary's] [Linked Third Party's] Financial Statement(s).

There was no conflict of interest⁴ between the Auditor and the Beneficiary [and Linked Third Party] in establishing this Report. The total fee paid to the Auditor for providing the Report was EUR _____ (including EUR _____ of deductible VAT).

We look forward to discussing our Report with you and would be pleased to provide any further information or assistance.

[legal name of the Auditor]

[name and function of an authorised representative]

[dd Month yyyy]

Signature of the Auditor

⁴ A conflict of interest arises when the Auditor's objectivity to establish the certificate is compromised in fact or in appearance when the Auditor for instance:

- was involved in the preparation of the Financial Statements;
- stands to benefit directly should the certificate be accepted;
- has a close relationship with any person representing the beneficiary;
- is a director, trustee or partner of the beneficiary; or
- is in any other situation that compromises his or her independence or ability to establish the certificate impartially.

Agreed-upon procedures to be performed and standard factual findings to be confirmed by the Auditor

The European Commission reserves the right to i) provide the auditor with additional guidance regarding the procedures to be followed or the facts to be ascertained and the way in which to present them (this may include sample coverage and findings) or to ii) change the procedures, by notifying the Beneficiary in writing. The procedures carried out by the auditor to confirm the standard factual finding are listed in the table below.

If this certificate relates to a Linked Third Party, any reference here below to 'the Beneficiary' is to be considered as a reference to 'the Linked Third Party'.

The 'result' column has three different options: 'C', 'E' and 'N.A.':

- 'C' stands for 'confirmed' and means that the auditor can confirm the 'standard factual finding' and, therefore, there is no exception to be reported.
- 'E' stands for 'exception' and means that the Auditor carried out the procedures but cannot confirm the 'standard factual finding', or that the Auditor was not able to carry out a specific procedure (e.g. because it was impossible to reconcile key information or data were unavailable),
- 'N.A.' stands for 'not applicable' and means that the Finding did not have to be examined by the Auditor and the related Procedure(s) did not have to be carried out. The reasons of the non-application of a certain Finding must be obvious i.e. i) if no cost was declared under a certain category then the related Finding(s) and Procedure(s) are not applicable; ii) if the condition set to apply certain Procedure(s) are not met then the related Finding(s) and Procedure(s) are not applicable. For instance, for 'beneficiaries with accounts established in a currency other than the euro' the Procedure related to 'beneficiaries with accounts established in euro' is not applicable. Similarly, if no additional remuneration is paid, the related Finding(s) and Procedure(s) for additional remuneration are not applicable.

Ref	Procedures	Standard factual finding	Result (C / E / N.A.)
A	ACTUAL PERSONNEL COSTS AND UNIT COSTS CALCULATED BY THE BENEFICIARY IN ACCORDANCE WITH ITS USUAL COST ACCOUNTING PRACTICE		

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Ref	Procedures	Standard factual finding	Result (C / E / N.A.)
	The Auditor draws a sample of persons whose costs were declared in the Financial Statement(s) to carry out the procedures indicated in the consecutive points of this section A. <i>(The sample should be selected randomly so that it is representative. Full coverage is required if there are fewer than 10 people (including employees, natural persons working under a direct contract and personnel seconded by a third party), otherwise the sample should have a minimum of 10 people, or 10% of the total, whichever number is the highest)</i> The Auditor sampled _____ people out of the total of _____ people.		
A.1	PERSONNEL COSTS For the persons included in the sample and working under an employment contract or equivalent act (general procedures for individual actual personnel costs and personnel costs declared as unit costs) To confirm standard factual findings 1-5 listed in the next column, the Auditor reviewed following information/documents provided by the Beneficiary: - o a list of the persons included in the sample indicating the period(s) during which they worked for the action, their position (classification or category) and type of contract; - o the payslips of the employees included in the sample; - o reconciliation of the personnel costs declared in the Financial Statement(s) with the accounting system (project accounting and general ledger) and payroll system; - o information concerning the employment status and employment conditions of personnel included in the sample, in particular their employment contracts or equivalent;	1) The employees were i) directly hired by the Beneficiary in accordance with its national legislation, ii) under the Beneficiary's sole technical supervision and responsibility and iii) remunerated in accordance with the Beneficiary's usual practices. 2) Personnel costs were recorded in the Beneficiary's accounts/payroll system. 3) Costs were adequately supported and reconciled with the accounts and payroll	

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Ref	Procedures	Standard factual finding	Result (C / E / N.A.)
	- the Beneficiary's usual policy regarding payroll matters (e.g. salary policy, overtime policy, variable pay); - applicable national law on taxes, labour and social security and - any other document that supports the personnel costs declared. The Auditor also verified the eligibility of all components of the retribution (see Article 6 GA) and recalculated the personnel costs for employees included in the sample.	records.	
		4) Personnel costs did not contain any ineligible elements.	
		5) There were no discrepancies between the personnel costs charged to the action and the costs recalculated by the Auditor.	
	<i>Further procedures if 'additional remuneration' is paid</i> To confirm standard factual findings 6-9 listed in the next column, the Auditor: - reviewed relevant documents provided by the Beneficiary (legal form, legal/statutory obligations, the Beneficiary's usual policy on additional remuneration, criteria used for its calculation...); - recalculated the amount of additional remuneration eligible for the action based on the supporting documents received (full-time or part-time work, exclusive or non-exclusive dedication to the action, etc.) to arrive at the applicable FTE/year and pro-rata rate (see data collected in the course of carrying out the procedures under A.2 'Productive hours' and A.4 'Time recording system').	6) The Beneficiary paying "additional remuneration" was a non-profit legal entity.	
		7) The amount of additional remuneration paid to the Beneficiary's usual remuneration practices and was consistently paid whenever the same kind of work or expertise was required.	

Grant Agreement number: [insert number] [insert acronym] [insert call/sub-call identifier]

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Ref	Procedures	Standard factual finding	Result (C / E / N.A.)
	IF ANY PART OF THE REMUNERATION PAID TO THE EMPLOYEE IS NOT MANDATORY ACCORDING TO THE NATIONAL LAW OR THE EMPLOYMENT CONTRACT ("ADDITIONAL REMUNERATION") AND IS ELIGIBLE UNDER THE PROVISIONS OF ARTICLE 6.2.A.1, THIS CAN BE CHARGED AS ELIGIBLE COST TO THE ACTION UP TO THE FOLLOWING AMOUNT: (A) IF THE PERSON WORKS FULL TIME AND EXCLUSIVELY ON THE ACTION DURING THE FULL YEAR: UP TO EUR 8 000/YEAR; (B) IF THE PERSON WORKS EXCLUSIVELY ON THE ACTION BUT NOT FULL-TIME OR NOT FOR THE FULL YEAR: UP TO THE CORRESPONDING PRO-RATA AMOUNT OF EUR 8 000, OR (C) IF THE PERSON DOES NOT WORK EXCLUSIVELY ON THE ACTION: UP TO A PRO-RATA AMOUNT CALCULATED IN ACCORDANCE TO ARTICLE 6.2.A.1.	8) The criteria used to calculate the additional remuneration were objective and generally applied by the Beneficiary regardless of the source of funding used. 9) The amount of additional remuneration included in the personnel costs charged to the action was capped at EUR 8,000 per FTE/year (up to the equivalent pro-rata amount if the person did not work on the action full-time during the year or did not work exclusively on the action). 10) The personnel costs included in the Financial Statement were calculated in accordance with the Beneficiary's usual cost accounting practice. This methodology was consistently used in all H2020 actions.	
	<i>Additional procedures in case "unit costs calculated by the Beneficiary in accordance with its usual cost accounting practices" is applied:</i> Apart from carrying out the procedures indicated above to confirm standard factual findings 1-5 and, if applicable, also 6-9, the Auditor carried out following procedures to confirm standard factual findings 10-13 listed in the next column:		

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Ref	Procedures	Standard factual finding	Result (C / E / N.A.)
	- obtained a description of the Beneficiary's usual cost accounting practice to calculate unit costs; - reviewed whether the Beneficiary's usual cost accounting practice was applied for the Financial Statements subject of the present CFS; - verified the employees included in the sample were charged under the correct category (in accordance with the criteria used by the Beneficiary to establish personnel categories) by reviewing the contract/HR-record or analytical accounting records; - verified that there is no difference between the total amount of personnel costs used in calculating the cost per unit and the total amount of personnel costs recorded in the statutory accounts; - verified whether actual personnel costs were adjusted on the basis of budgeted or estimated elements and, if so, verified whether those elements used are actually relevant for the calculation, objective and supported by documents.	11) The employees were charged under the correct category.	
		12) Total personnel costs used in calculating the unit costs were consistent with the expenses recorded in the statutory accounts.	
		13) Any estimated or budgeted element used by the Beneficiary in its unit-cost calculation were relevant for calculating personnel costs and corresponded to objective and verifiable information.	
		14) The natural persons reported to the Beneficiary (worked under the Beneficiary's instructions).	
		15) They worked on the Beneficiary's premises (unless otherwise agreed with the Beneficiary).	
	<u>For natural persons included in the sample and working with the Beneficiary under a direct contract other than an employment contract, such as consultants (no subcontractors).</u> To confirm standard factual findings 14-18 listed in the next column the Auditor reviewed following information/documents provided by the Beneficiary: the contracts, especially the cost, contract duration, work description, place of work, ownership of the results and reporting obligations to the Beneficiary;		

Grant Agreement number: [insert number] [insert acronym] [insert call/sub-call identifier]

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Ref	Procedures	Standard factual finding	Result (C / E / N.A.)
	- the employment conditions of staff in the same category to compare costs and; - any other document that supports the costs declared and its registration (e.g. invoices, accounting records, etc.).	16) The results of work carried out belong to the Beneficiary.	
		17) Their costs were not significantly different from those for staff who performed similar tasks under an employment contract with the Beneficiary.	
		18) The costs were supported by audit evidence and registered in the accounts.	
	<u>For personnel seconded by a third party and included in the sample (not subcontractors)</u> To confirm standard factual findings 19-22 listed in the next column, the Auditor reviewed following information/documents provided by the Beneficiary: - their secondment contract(s) notably regarding costs, duration, work description, place of work and ownership of the results; - if there is reimbursement by the Beneficiary to the third party for the resource made available (in-kind contribution against payment): any documentation that supports the costs declared (e.g. contract, invoice, bank payment, and proof of registration in its accounting/payroll, etc.) and reconciliation of the Financial Statement(s) with the accounting system (project accounting and general ledger) as well as any proof that the amount invoiced by the third party did not include any profit;	19) Seconded personnel reported to the Beneficiary and worked on the Beneficiary's premises (unless otherwise agreed with the Beneficiary).	
		20) The results of work carried out belong to the Beneficiary.	
		<i>If personnel is seconded against payment:</i> 21) The costs declared were supported with documentation and recorded in the	

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Ref	Procedures	Standard factual finding	Result (C / E / N.A.)
	- if there is no reimbursement by the Beneficiary to the third party for the resource made available (in-kind contribution free of charge): a proof of the actual cost borne by the Third Party for the resource made available free of charge to the Beneficiary such as a statement of costs incurred by the Third Party and proof of the registration in the Third Party's accounting/payroll; - any other document that supports the costs declared (e.g. invoices, etc.).	Beneficiary's accounts. The third party did not include any profit. <i>If personnel is seconded free of charge:</i> 22) The costs declared did not exceed the third party's cost as recorded in the accounts of the third party and were supported with documentation.	
A.2	PRODUCTIVE HOURS To confirm standard factual findings 23-28 listed in the next column, the Auditor reviewed relevant documents, especially national legislation, labour agreements and contracts and time records of the persons included in the sample, to verify that: - the annual productive hours applied were calculated in accordance with one of the methods described below, - the full-time equivalent (FTEs) ratios for employees not working full-time were correctly calculated.	23) The Beneficiary applied method [choose one option and delete the others] [A: 1720 hours] [B: the 'total number of hours worked'] [C: 'annual productive hours' used correspond to usual accounting practices]	

Grant Agreement number: [insert number] [insert acronym] [insert call/sub-call identifier]

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Ref	Proc	Standard factual finding	Result (C / E / N.A.)
	If the Beneficiary applied method B, the auditor verified that the number of hours worked was calculated and that the contracts show hours. If the Beneficiary applied method C, the auditor verified that the 'annual productive hours' applied when calculating the hourly rate were equivalent to at least 90 % of the 'standard annual workable hours'. The Auditor can only do this if the calculation of the standard annual workable hours can be supported by records, such as national legislation, labour agreements, and contracts. BENEFICIARY'S PRODUCTIVE HOURS' FOR PERSONS WORKING FULL TIME SHALL BE ONE OF THE FOLLOWING METHODS: A. 1720 ANNUAL PRODUCTIVE HOURS (PRO-RATA FOR PERSONS NOT WORKING FULL-TIME) B. THE TOTAL NUMBER OF HOURS WORKED BY THE PERSON FOR THE BENEFICIARY IN THE YEAR (THIS METHOD IS ALSO REFERRED TO AS 'TOTAL NUMBER OF HOURS WORKED' IN THE NEXT COLUMN). THE CALCULATION OF THE TOTAL NUMBER OF HOURS WORKED WAS DONE AS FOLLOWS: ANNUAL WORKABLE HOURS OF THE PERSON ACCORDING TO THE EMPLOYMENT CONTRACT, APPLICABLE LABOUR AGREEMENT OR NATIONAL LAW PLUS OVERTIME WORKED MINUS ABSENCES (SUCH AS SICK LEAVE OR SPECIAL LEAVE).	24) Productive hours were calculated annually. 25) For employees not working full-time the full-time equivalent (FTE) ratio was correctly applied. <i>If the Beneficiary applied method B.</i> 26) The calculation of the number of 'annual workable hours', overtime and absences was verifiable based on the documents provided by the Beneficiary. <i>If the Beneficiary applied method C.</i> 27) The calculation of the number of 'standard annual workable hours' was verifiable based on the documents provided by the Beneficiary.	

Grant Agreement number: [insert number] [insert acronym] [insert call/sub-call identifier]

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Ref	Procedures	Standard factual finding	Result (C / E / N.A.)
	C. THE STANDARD NUMBER OF ANNUAL HOURS GENERALLY APPLIED BY THE BENEFICIARY FOR ITS PERSONNEL IN ACCORDANCE WITH ITS USUAL COST ACCOUNTING PRACTICES (THIS METHOD IS ALSO REFERRED TO AS 'TOTAL ANNUAL PRODUCTIVE HOURS' IN THE NEXT COLUMN). THIS NUMBER MUST BE AT LEAST 90% OF THE STANDARD ANNUAL WORKABLE HOURS. 'ANNUAL WORKABLE HOURS' MEANS THE PERIOD DURING WHICH THE PERSONNEL MUST BE WORKING, AT THE EMPLOYER'S DISPOSAL AND CARRYING OUT HIS/HER ACTIVITY OR DUTIES UNDER THE EMPLOYMENT CONTRACT, APPLICABLE COLLECTIVE LABOUR AGREEMENT OR NATIONAL WORKING TIME LEGISLATION.	28) The 'annual productive hours' used for calculating the hourly rate were consistent with the usual cost accounting practices of the Beneficiary and were equivalent to at least 90 % of the 'annual workable hours'.	
A.3	HOURLY PERSONNEL RATES <u>1) For unit costs calculated in accordance to the Beneficiary's usual cost accounting practice (unit costs):</u> If the Beneficiary has a "Certificate on Methodology to calculate unit costs " (CoMUC) approved by the Commission, the Beneficiary provides the Auditor with a description of the approved methodology and the Commission's letter of acceptance. The Auditor verified that the Beneficiary has indeed used the methodology approved. If so, no further verification is necessary. If the Beneficiary does not have a "Certificate on Methodology" (CoMUC) approved by the	29) The Beneficiary applied [choose one option and delete the other]: [Option I: "Unit costs (hourly rates) were calculated in accordance with the Beneficiary's usual cost accounting practices"] [Option II: Individual hourly rates were applied]	

Grant Agreement number: [insert number] [insert acronym] [insert call/sub-call identifier]

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Ref	Procedures	Standard factual finding	Result (C / E / N.A.)
	Commission, or if the methodology approved was not applied, then the Auditor: - o reviewed the documentation provided by the Beneficiary, including manuals and internal guidelines that explain how to calculate hourly rates; - o recalculated the unit costs (hourly rates) of staff included in the sample following the results of the procedures carried out in A.1 and A.2. <u>III) For individual hourly rates:</u> The Auditor: - o reviewed the documentation provided by the Beneficiary, including manuals and internal guidelines that explain how to calculate hourly rates; - o recalculated the hourly rates of staff included in the sample following the results of the procedures carried out in A.1 and A.2. <u>"UNIT COSTS CALCULATED BY THE BENEFICIARY IN ACCORDANCE WITH ITS USUAL COST ACCOUNTING PRACTICES":</u> IT IS CALCULATED BY DIVIDING THE TOTAL AMOUNT OF PERSONNEL COSTS OF THE CATEGORY TO WHICH THE EMPLOYEE BELONGS VERIFIED IN LINE WITH PROCEDURE A.1 BY THE NUMBER OF FTE AND THE ANNUAL TOTAL PRODUCTIVE HOURS OF THE SAME CATEGORY CALCULATED BY THE BENEFICIARY IN ACCORDANCE WITH PROCEDURE A.2. <u>HOURLY RATE FOR INDIVIDUAL ACTUAL PERSONAL COSTS:</u> IT IS CALCULATED BY DIVIDING THE TOTAL AMOUNT OF PERSONNEL COSTS OF AN EMPLOYEE VERIFIED IN LINE WITH	<i>For option I concerning unit costs and if the Beneficiary applies the methodology approved by the Commission (CoMUC):</i> 30) The Beneficiary used the Commission-approved methodology to calculate hourly rates. It corresponded to the organisation's usual cost accounting practices and was applied consistently for all activities irrespective of the source of funding. <i>For option I concerning unit costs and if the Beneficiary applies a methodology not approved by the Commission:</i> 31) The unit costs re-calculated by the Auditor were the same as the rates applied by the Beneficiary. <i>For option II concerning individual hourly rates:</i>	

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Ref	Procedures	Standard factual finding	Result (C / E / N.A.)
	PROCEDURE A.1 BY THE NUMBER OF ANNUAL PRODUCTIVE HOURS VERIFIED IN LINE WITH PROCEDURE A.2.	32) The individual rates re-calculated by the Auditor were the same as the rates applied by the Beneficiary.	
A.4	TIME RECORDING SYSTEM To verify that the time recording system ensures the fulfilment of all minimum requirements and that the hours declared for the action were correct, accurate and properly authorised and supported by documentation, the Auditor made the following checks for the persons included in the sample that declare time as worked for the action on the basis of time records: - o description of the time recording system provided by the Beneficiary (registration, authorisation, processing in the HR-system); - o its actual implementation; - o time records were signed at least monthly by the employees (on paper or electronically) and authorised by the project manager or another manager; - o the hours declared were worked within the project period; - o there were no hours declared as worked for the action if HR-records showed absence due to holidays or sickness (further cross-checks with travels are carried out in B.1 below) ;	33) All persons recorded their time dedicated to the action on a daily/ weekly/ monthly basis using a paper/computer-based system. <i>(delete the answers that are not applicable)</i> 34) Their time-records were authorised at least monthly by the project manager or other superior. 35) Hours declared were worked within the project period and were consistent with the presences/absences recorded in HR-records.	

Grant Agreement number: [insert number] [insert acronym] [insert call/sub-call identifier]

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Ref	Procedures	Standard factual finding	Result (C / E / N.A.)
	o the hours charged to the action matched those in the time recording system. <i>ONLY THE HOURS WORKED ON THE ACTION CAN BE CHARGED. ALL WORKING TIME TO BE CHARGED SHOULD BE RECORDED THROUGHOUT THE DURATION OF THE PROJECT, ADEQUATELY SUPPORTED BY EVIDENCE OF THEIR REALITY AND RELIABILITY (SEE SPECIFIC PROVISIONS BELOW FOR PERSONS WORKING EXCLUSIVELY FOR THE ACTION WITHOUT TIME RECORDS).</i> <u>If the persons are working exclusively for the action and without time records</u> For the persons selected that worked exclusively for the action without time records, the Auditor verified evidence available demonstrating that they were in reality exclusively dedicated to the action and that the Beneficiary signed a declaration confirming that they have worked exclusively for the action.	36) There were no discrepancies between the number of hours charged to the action and the number of hours recorded. 37) The exclusive dedication is supported by a declaration signed by the Beneficiary's and by any other evidence gathered.	
B	COSTS OF SUBCONTRACTING		
B.1	The Auditor obtained the detail/breakdown of subcontracting costs and sampled _____ cost items selected randomly (full coverage is required if there are fewer than 10 items, otherwise the sample should have a minimum of 10 item, or 10% of the total, whichever number is highest). To confirm standard factual findings 38-42 listed in the next column, the Auditor reviewed the	38) The use of claimed subcontracting costs was foreseen in Annex 1 and costs were declared in the Financial Statements under the subcontracting category.	

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Ref	Procedures	Standard factual finding	Result (C / E / N.A.)
	following for the items included in the sample: - the use of subcontractors was foreseen in Annex 1; - subcontracting costs were declared in the subcontracting category of the Financial Statement; - supporting documents on the selection and award procedure were followed; - the Beneficiary ensured best value for money (key elements to appreciate the respect of this principle are the award of the subcontract to the bid offering best price-quality ratio, under conditions of transparency and equal treatment. In case an existing framework contract was used the Beneficiary ensured it was established on the basis of the principle of best value for money under conditions of transparency and equal treatment). In particular, - if the Beneficiary acted as a contracting authority within the meaning of Directive 2004/18/EC or of Directive 2004/17/EC, the Auditor verified that the applicable national law on public procurement was followed and that the subcontracting complied with the Terms and Conditions of the Agreement. - if the Beneficiary did not fall under the above-mentioned category the Auditor verified that the Beneficiary followed their usual procurement rules and respected the Terms and Conditions of the Agreement.. For the items included in the sample the Auditor also verified that: - the subcontracts were not awarded to other Beneficiaries in the consortium;	39) There were documents of requests to different providers, different offers and assessment of the offers before selection of the provider in line with internal procedures and procurement rules. Subcontracts were awarded in accordance with the principle of best value for money. <i>(When different offers were not collected the Auditor explains the reasons provided by the Beneficiary under the caption "Exceptions" of the Report. The Commission will analyse this information to evaluate whether these costs might be accepted as eligible)</i>	
		40) The subcontracts were not awarded to other Beneficiaries of the consortium.	

Grant Agreement number: [insert number] [insert acronym] [insert call/sub-call identifier]

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Ref	Procedures	Standard factual finding	Result (C / E / N.A.)
	- there were signed agreements between the Beneficiary and the subcontractor; - there was evidence that the services were provided by subcontractor;	41) All subcontracts supported by agreements between the Beneficiary and the subcontractor. 42) There was evidence that the services were provided by the subcontractors.	
C	COSTS OF PROVIDING FINANCIAL SUPPORT TO THIRD PARTIES		
C.1	The Auditor obtained the detail/breakdown of the costs of providing financial support to third parties and sampled _____ cost items selected randomly (full coverage is required if there are fewer than 10 items, otherwise the sample should have a minimum of 10 items, or 10% of the total, whichever number is highest). The Auditor verified that the following minimum conditions were met: a) the maximum amount of financial support for each third party did not exceed EUR 60 000, unless explicitly mentioned in Annex 1; b) the financial support to third parties was agreed in Annex 1 of the Agreement and the other provisions on financial support to third parties included in Annex 1 were	43) All minimum conditions were met	

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Ref	Procedures	Standard factual finding	Result (C / E / N.A.)
	respected.		

Grant Agreement number: [insert number] [insert acronym] [insert call/sub-call identifier]

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D	OTHER ACTUAL DIRECT COSTS	
D.1	COSTS OF TRAVEL AND RELATED SUBSISTENCE ALLOWANCES The Auditor sampled _____ cost items selected randomly (full coverage is required if there are fewer than 10 items, otherwise the sample should have a minimum of 10 items, or 10% of the total, whichever number is the highest). The Auditor inspected the sample and verified that: - o travel and subsistence costs were consistent with the Beneficiary's usual policy for travel. In this context, the Beneficiary provided evidence of its normal policy for travel costs (e.g. use of first class tickets, reimbursement by the Beneficiary on the basis of actual costs, a lump sum or per diem) to enable the Auditor to compare the travel costs charged with this policy; - o travel costs are correctly identified and allocated to the action (e.g. trips are directly linked to the action) by reviewing relevant supporting documents such as minutes of meetings, workshops or conferences, their registration in the correct project account, their consistency with time records or with the dates/duration of the workshop/conference; - o no ineligible costs or excessive or reckless expenditure was declared.	44) Costs were incurred, approved and reimbursed in line with the Beneficiary's usual policy for travels. 45) There was a link between the trip and the action. 46) The supporting documents were consistent with each other regarding subject of the trip, dates, duration and reconciled with time records and accounting. 47) No ineligible costs or excessive or reckless expenditure was declared.
D.2	DEPRECIATION COSTS FOR EQUIPMENT, INFRASTRUCTURE OR OTHER ASSETS The Auditor sampled _____ cost items selected randomly (full coverage is required if there are fewer than 10 items, otherwise the sample should have a minimum of 10 items, or 10% of the total, whichever number is the highest). For "equipment, infrastructure or other assets" [from now on called "asset(s)"] selected in the	48) Procurement rules, principles and guides were followed. 49) There was a link between the grant agreement and the asset charged to the action.

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	sample the Auditor verified that: - the assets were acquired in conformity with the Beneficiary's internal guidelines and procedures; - they were correctly allocated to the action (with supporting documents such as delivery note invoice or any other proof demonstrating the link to the action) - they were entered in the accounting system; - the extent to which the assets were used for the action (as a percentage) was supported by reliable documentation (e.g. usage overview table); The Auditor recalculated the depreciation costs and verified that they were in line with the applicable rules in the Beneficiary's country and with the Beneficiary's usual accounting policy (e.g. depreciation calculated on the acquisition value). The Auditor verified that no ineligible costs such as deductible VAT, exchange rate losses, excessive or reckless expenditure were declared (see Article 6.5 GA).	50) The asset charged to the action was traceable to the accounting records and the underlying documents.	51) The depreciation method used to charge the asset to the action was in line with the applicable rules of the Beneficiary's country and the Beneficiary's usual accounting policy.	52) The amount charged corresponded to the actual usage for the action.	53) No ineligible costs or excessive or reckless expenditure were declared.	54) Contracts for works or services did not cover tasks described in Annex 1.	55) Costs were allocated to the correct action and the goods were not placed in the inventory of durable equipment.
D.3	COSTS OF OTHER GOODS AND SERVICES The Auditor sampled _____ cost items selected randomly (full coverage is required if there are fewer than 10 items, otherwise the sample should have a minimum of 10 items, or 10% of the total, whichever number is highest). For the purchase of goods, works or services included in the sample the Auditor verified that: the contracts did not cover tasks described in Annex 1;						

Grant Agreement number: [insert number] [insert acronym] [insert call/sub-call identifier]

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- they were correctly identified, allocated to the proper action, entered in the accounting system (traceable to underlying documents such as purchase orders, invoices and accounting); - the goods were not placed in the inventory of durable equipment; - the costs charged to the action were accounted in line with the Beneficiary's usual accounting practices; - no ineligible costs or excessive or reckless expenditure were declared (see Article 6 GA). In addition, the Auditor verified that these goods and services were acquired in conformity with the Beneficiary's internal guidelines and procedures, in particular: - if Beneficiary acted as a contracting authority within the meaning of Directive 2004/18/EC or of Directive 2004/17/EC, the Auditor verified that the applicable national law on public procurement was followed and that the procurement contract complied with the Terms and Conditions of the Agreement. - if the Beneficiary did not fall into the category above, the Auditor verified that the Beneficiary followed their usual procurement rules and respected the Terms and Conditions of the Agreement. For the items included in the sample the Auditor also verified that: - the Beneficiary ensured best value for money (key elements to appreciate the respect of this principle are the award of the contract to the bid offering best price-quality ratio, under conditions of transparency and equal treatment. In case an existing framework contract was used the Auditor also verified that the Beneficiary ensured it was established on the basis of the principle of best value for money under conditions of transparency and equal treatment); SUCH GOODS AND SERVICES INCLUDE, FOR INSTANCE, CONSUMABLES AND SUPPLIES, DISSEMINATION (INCLUDING OPEN ACCESS), PROTECTION OF RESULTS, SPECIFIC EVALUATION OF THE ACTION IF IT IS REQUIRED BY THE	56) The costs were charged in line with the Beneficiary's accounting policy and were adequately supported. 57) No ineligible costs or excessive or reckless expenditure were declared. For internal invoices/charges only the cost element was charged, without any mark-ups. 58) Procurement rules, principles and guides were followed. There were documents of requests to different providers, different offers and assessment of the offers before selection of the provider in line with internal procedures and procurement rules. The purchases were made in accordance with the principle of best value for money. <i>(When different offers were not collected the Auditor explains the reasons provided by the Beneficiary under the</i>	

	AGREEMENT, CERTIFICATES ON THE FINANCIAL STATEMENTS IF THEY ARE REQUIRED BY THE AGREEMENT AND CERTIFICATES ON THE METHODOLOGY, TRANSLATIONS, REPRODUCTION.	<i>caption "Exceptions" of the Report. The Commission will analyse this information to evaluate whether these costs might be accepted as eligible)</i>	
D.4	AGGREGATED CAPITALISED AND OPERATING COSTS OF RESEARCH INFRASTRUCTURE The Auditor ensured the existence of a positive ex-ante assessment (issued by the EC Services) of the cost accounting methodology of the Beneficiary allowing it to apply the guidelines on direct costing for large research infrastructures in Horizon 2020. <i>In the cases that a positive ex-ante assessment has been issued (see the standard factual findings 59-60 on the next column),</i> The Auditor ensured that the beneficiary has applied consistently the methodology that is explained and approved in the positive ex ante assessment; <i>In the cases that a positive ex-ante assessment has NOT been issued (see the standard factual findings 61 on the next column),</i> The Auditor verified that no costs of Large Research Infrastructure have been charged as direct costs in any costs category;	59) The costs declared as direct costs for Large Research Infrastructures (in the appropriate line of the Financial Statement) comply with the methodology described in the positive ex-ante assessment report. 60) Any difference between the methodology applied and the one positively assessed was extensively described and adjusted accordingly. 61) The direct costs declared were free from any indirect costs items related to the Large Research Infrastructure.	

Grant Agreement number: [insert number] [insert acronym] [insert call/sub-call identifier]

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		<i>In the cases that a draft ex-ante assessment report has been issued with recommendation for further changes (see the standard factual findings 61 on the next column),</i> The Auditor followed the same procedure as above (when a positive ex-ante assessment has NOT yet been issued) and paid particular attention (testing reinforced) to the cost items for which the draft ex-ante assessment either rejected the inclusion as direct costs for Large Research Infrastructures or issued recommendations.		
E	USE OF EXCHANGE RATES			
E.1	a) For Beneficiaries with accounts established in a currency other than euros The Auditor sampled _____ cost items selected randomly and verified that the exchange rates used for converting other currencies into euros were in accordance with the following rules established in the Agreement (full coverage is required if there are fewer than 10 items, otherwise the sample should have a minimum of 10 item, or 10% of the total, whichever number is highest): COSTS INCURRED IN ANOTHER CURRENCY SHALL BE CONVERTED INTO EURO AT THE AVERAGE OF THE DAILY EXCHANGE RATES PUBLISHED IN THE C SERIES OF OFFICIAL JOURNAL OF THE EUROPEAN UNION (https://www.ecb.int/stats/exchange/eurofxref/html/index.en.html), DETERMINED OVER THE CORRESPONDING REPORTING PERIOD. IF NO DAILY EURO EXCHANGE RATE IS PUBLISHED IN THE OFFICIAL JOURNAL OF THE EUROPEAN UNION FOR THE CURRENCY IN QUESTION, CONVERSION SHALL BE MADE AT THE AVERAGE OF THE MONTHLY ACCOUNTING RATES ESTABLISHED BY THE COMMISSION AND PUBLISHED ON ITS WEBSITE (http://ec.europa.eu/budget/contracts_grants/info_contracts/infoeuro/infoeuro_en.cfm),	62) The exchange rates used to convert other currencies into Euros were in accordance with the rules established of the Grant Agreement and there was no difference in the final figures.		

DETERMINED OVER THE CORRESPONDING REPORTING PERIOD.		
	b) For Beneficiaries with accounts established in euros The Auditor sampled _____ cost items selected randomly and verified that the exchange rates used for converting other currencies into euros were in accordance with the following rules established in the Agreement (full coverage is required if there are fewer than 10 items, otherwise the sample should have a minimum of 10 item, or 10% of the total, whichever number is highest): COSTS INCURRED IN ANOTHER CURRENCY SHALL BE CONVERTED INTO EURO BY APPLYING THE BENEFICIARY'S USUAL ACCOUNTING PRACTICES.	
	63) The Beneficiary applied its usual accounting practices.	

[legal name of the audit firm]

[name and function of an authorised representative]

[dd Month yyyy]

<Signature of the Auditor>

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ANNEX 6

MODEL FOR THE CERTIFICATE ON THE METHODOLOGY

- For options [*in italics in square brackets*]: choose the applicable option. Options not chosen should be deleted.
- For fields in [grey in square brackets]: enter the appropriate data.

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INDEPENDENT REPORT OF FACTUAL FINDINGS ON THE METHODOLOGY CONCERNING GRANT AGREEMENTS FINANCED UNDER THE HORIZON 2020 RESEARCH AND INNOVATION FRAMEWORK PROGRAMME 7

Terms of reference for an audit engagement for a methodology certificate in connection with one or more grant agreements financed under the Horizon 2020 Research and Innovation Framework Programme

This document sets out the 'Terms of Reference (ToR)' under which

[OPTION 1: *[insert name of the beneficiary]* ('the Beneficiary')] [OPTION 2: *[insert name of the linked third party]* ('the Linked Third Party'), third party linked to the Beneficiary *[insert name of the beneficiary]* ('the Beneficiary')]

agrees to engage

[insert legal name of the auditor] ('the Auditor')

to produce an independent report of factual findings ('the Report') concerning the *[Beneficiary's]* *[Linked Third Party's]* usual accounting practices for calculating and claiming direct personnel costs declared as unit costs ('the Methodology') in connection with grant agreements financed under the Horizon 2020 Research and Innovation Framework Programme.

The procedures to be carried out for the assessment of the methodology will be based on the grant agreement(s) detailed below:

[title and number of the grant agreement(s)] ('the Agreement(s)')

The Agreement(s) has(have) been concluded between the Beneficiary and [OPTION 1: *the European Union, represented by the European Commission ('the Commission')*][OPTION 2: *the European Atomic Energy Community (Euratom,) represented by the European Commission ('the Commission')*][OPTION 3: *the [Research Executive Agency (REA)] [European Research Council Executive Agency (ERCEA)] [Innovation and Networks Executive Agency (INEA)] [Executive Agency for Small and Medium-sized Enterprises (EASME)] ('the Agency'), under the powers delegated by the European Commission ('the Commission').*].

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The [Commission] [Agency] is mentioned as a signatory of the Agreement with the Beneficiary only.
The [European Union] [Euratom] [Agency] is not a party to this engagement.

1.1 Subject of the engagement

According to Article 18.1.2 of the Agreement, beneficiaries *[and linked third parties]* that declare direct personnel costs as unit costs calculated in accordance with their usual cost accounting practices may submit to the [Commission] [Agency], for approval, a certificate on the methodology ('CoMUC') stating that there are adequate records and documentation to prove that their cost accounting practices used comply with the conditions set out in Point A of Article 6.2.

The subject of this engagement is the CoMUC which is composed of two separate documents:

- the Terms of Reference ('the ToR') to be signed by the [Beneficiary] [Linked Third Party] and the Auditor;
- the Auditor's Independent Report of Factual Findings ('the Report') issued on the Auditor's letterhead, dated, stamped and signed by the Auditor which includes; the standard statements ('the Statements') evaluated and signed by the [Beneficiary] [Linked Third Party], the agreed-upon procedures ('the Procedures') performed by the Auditor and the standard factual findings ('the Findings') assessed by the Auditor. The Statements, Procedures and Findings are summarised in the table that forms part of the Report.

The information provided through the Statements, the Procedures and the Findings will enable the Commission to draw conclusions regarding the existence of the [Beneficiary's] [Linked Third Party's] ~~usual cost accounting practice and its suitability to ensure that direct personnel costs claimed on that~~ basis comply with the provisions of the Agreement. The Commission draws its own conclusions from the Report and any additional information it may require.

1.2 Responsibilities

The parties to this agreement are the [Beneficiary] [Linked Third Party] and the Auditor.

The [Beneficiary] [Linked Third Party]:

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- is responsible for preparing financial statements for the Agreement(s) ('the Financial Statements') in compliance with those Agreements;
- is responsible for providing the Financial Statement(s) to the Auditor and enabling the Auditor to reconcile them with the [Beneficiary's] [Linked Third Party's] accounting and bookkeeping system and the underlying accounts and records. The Financial Statement(s) will be used as a basis for the procedures which the Auditor will carry out under this ToR;
- is responsible for its Methodology and liable for the accuracy of the Financial Statement(s);
- is responsible for endorsing or refuting the Statements indicated under the heading 'Statements to be made by the Beneficiary/ Linked Third Party' in the first column of the table that forms part of the Report;
- must provide the Auditor with a signed and dated representation letter;
- accepts that the ability of the Auditor to carry out the Procedures effectively depends upon the [Beneficiary] [Linked Third Party] providing full and free access to the [Beneficiary's] [Linked Third Party's] staff and to its accounting and other relevant records.

The Auditor:

- *[Option 1 by default: is qualified to carry out statutory audits of accounting documents in accordance with Directive 2006/43/EC of the European Parliament and of the Council of 17 May 2006 on statutory audits of annual accounts and consolidated accounts, amending Council Directives 78/660/EEC and 83/349/EEC and repealing Council Directive 84/253/EEC or similar national regulations].*
- *[Option 2 if the Beneficiary or Linked Third Party has an independent Public Officer: is a competent and independent Public Officer for which the relevant national authorities have established the legal capacity to audit the Beneficiary].*
- *[Option 3 if the Beneficiary or Linked Third Party is an international organisation: is an [internal] [external] auditor in accordance with the internal financial regulations and procedures of the international organisation].*

The Auditor:

- must be independent from the Beneficiary *[and the Linked Third Party]*, in particular, it must not have been involved in preparing the Beneficiary's *[and Linked Third Party's]* Financial Statement(s);
- must plan work so that the Procedures may be carried out and the Findings may be assessed;
- must adhere to the Procedures laid down and the compulsory report format;
- must carry out the engagement in accordance with these ToR;
- must document matters which are important to support the Report;
- must base its Report on the evidence gathered;
- must submit the Report to the *[Beneficiary] [Linked Third Party]*.

The Commission sets out the Procedures to be carried out and the Findings to be endorsed by the Auditor. The Auditor is not responsible for their suitability or pertinence. As this engagement is not an assurance engagement the Auditor does not provide an audit opinion or a statement of assurance.

1.3 Applicable Standards

The Auditor must comply with these Terms of Reference and with¹:

- the International Standard on Related Services ('ISRS') 4400 *Engagements to perform Agreed-upon Procedures regarding Financial Information* as issued by the International Auditing and Assurance Standards Board (IAASB);
- the *Code of Ethics for Professional Accountants* issued by the International Ethics Standards Board for Accountants (IESBA). Although ISRS 4400 states that independence is not a requirement for engagements to carry out agreed-upon procedures, the Commission requires that the Auditor also complies with the Code's independence requirements.

The Auditor's Report must state that there was no conflict of interests in establishing this Report between the Auditor and the Beneficiary *[and the Linked Third Party]* that could have a bearing on the Report, and must specify – if the service is invoiced - the total fee paid to the Auditor for providing the Report.

1.4 Reporting

The Report must be written in the language of the Agreement (see Article 20.7 of the Agreement).

Under Article 22 of the Agreement, the Commission, *[the Agency]*, the European Anti-Fraud Office and the Court of Auditors have the right to audit any work that is carried out under the action and for which costs are claimed from *[the European Union]* *[Euratom]* budget. This includes work related to this engagement. The Auditor must provide access to all working papers related to this assignment if the Commission, *[the Agency]*, the European Anti-Fraud Office or the European Court of Auditors requests them.

1.5 Timing

The Report must be provided by [dd Month yyyy].

¹ Supreme Audit Institutions applying INTOSAI-standards may carry out the Procedures according to the corresponding International Standards of Supreme Audit Institutions and code of ethics issued by INTOSAI instead of the International Standard on Related Services ('ISRS') 4400 and the Code of Ethics for Professional Accountants issued by the IAASB and the IESBA.

1.6 Other Terms

[The [Beneficiary] [Linked Third Party] and the Auditor can use this section to agree other specific terms, such as the Auditor's fees, liability, applicable law, etc. Those specific terms must not contradict the terms specified above.]

[legal name of the Auditor]

[legal name of the [Beneficiary] [Linked Third Party]]

[name & title of authorised representative]

[name & title of authorised representative]

[dd Month yyyy]

[dd Month yyyy]

Signature of the Auditor Signature

Signature of the [Beneficiary] [Linked Third Party]

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**Independent report of factual findings on the methodology concerning grant agreements financed
under the Horizon 2020 Research and Innovation Framework Programme**

(To be printed on letterhead paper of the auditor)

To

[name of contact person(s)], [Position]

[[Beneficiary's] [Linked Third Party's] name]

[Address]

[dd Month yyyy]

Dear [Name of contact person(s)],

As agreed under the terms of reference dated [dd Month yyyy]

with [OPTION 1: [insert name of the beneficiary] ('the Beneficiary')] [OPTION 2: [insert name of the
linked third party] ('the Linked Third Party'), third party linked to the Beneficiary [insert name of the
beneficiary] ('the Beneficiary')],

we

[name of the auditor] ('the Auditor'),

established at

[full address/city/state/province/country],

represented by

[name and function of an authorised representative],

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have carried out the agreed-upon procedures ('the Procedures') and provide hereby our Independent Report of Factual Findings ('the Report'), concerning the *[Beneficiary's] [Linked Third Party's]* usual accounting practices for calculating and declaring direct personnel costs declared as unit costs ('the Methodology').

You requested certain procedures to be carried out in connection with the grant(s)

[title and number of the grant agreement(s)] ('the Agreement(s)').

The Report

Our engagement was carried out in accordance with the terms of reference ('the ToR') appended to this Report. The Report includes: the standard statements ('the Statements') made by the *[Beneficiary] [Linked Third Party]*, the agreed-upon procedures ('the Procedures') carried out and the standard factual findings ('the Findings') confirmed by us.

The engagement involved carrying out the Procedures and assessing the Findings and the documentation requested appended to this Report, the results of which the Commission uses to draw conclusions regarding the acceptability of the Methodology applied by the *[Beneficiary] [Linked Third Party]*.

The Report covers the methodology used from [dd Month yyyy]. In the event that the *[Beneficiary] [Linked Third Party]* changes this methodology, the Report will not be applicable to any Financial Statement² submitted thereafter.

The scope of the Procedures and the definition of the standard statements and findings were determined solely by the Commission. Therefore, the Auditor is not responsible for their suitability or pertinence.

Since the Procedures carried out constitute neither an audit nor a review made in accordance with International Standards on Auditing or International Standards on Review Engagements, we do not

² Financial Statement in this context refers solely to Annex 4 of the Agreement by which the Beneficiary declares costs under the Agreement.

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give a statement of assurance on the costs declared on the basis of the [Beneficiary's] [Linked Third Party's] Methodology. Had we carried out additional procedures or had we performed an audit or review in accordance with these standards, other matters might have come to its attention and would have been included in the Report.

Exceptions

Apart from the exceptions listed below, the [Beneficiary] [Linked Third Party] agreed with the standard Statements and provided the Auditor all the documentation and accounting information needed by the Auditor to carry out the requested Procedures and corroborate the standard Findings.

List here any exception and add any information on the cause and possible consequences of each exception, if known. If the exception is quantifiable, also indicate the corresponding amount.

.....

Explanation of possible exceptions in the form of examples (to be removed from the Report):

- i. the [Beneficiary] [Linked Third Party] did not agree with the standard Statement number ... because...;*
- ii. the Auditor could not carry out the procedure ... established because (e.g. due to the inability to reconcile key information or the unavailability or inconsistency of data);*
- iii. the Auditor could not confirm or corroborate the standard Finding number ... because*

Remarks

We would like to add the following remarks relevant for the proper understanding of the Methodology applied by the [Beneficiary] [Linked Third Party] or the results reported:

Example (to be removed from the Report):

Regarding the methodology applied to calculate hourly rates ...

Regarding standard Finding 15 it has to be noted that ...

The [Beneficiary] [Linked Third Party] explained the deviation from the benchmark statement XXIV concerning time recording for personnel with no exclusive dedication to the action in the following manner:

...

Annexes

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Please provide the following documents to the auditor and annex them to the report when submitting this CoMUC to the Commission:

1. Brief description of the methodology for calculating personnel costs, productive hours and hourly rates;
2. Brief description of the time recording system in place;
3. An example of the time records used by the [Beneficiary] [Linked Third Party];
4. Description of any budgeted or estimated elements applied, together with an explanation as to why they are relevant for calculating the personnel costs and how they are based on objective and verifiable information;
5. A summary sheet with the hourly rate for direct personnel declared by the [Beneficiary] [Linked Third Party] and recalculated by the Auditor for each staff member included in the sample (the names do not need to be reported);
6. A comparative table summarising for each person selected in the sample a) the time claimed by the [Beneficiary] [Linked Third Party] in the Financial Statement(s) and b) the time according to the time record verified by the Auditor;
7. A copy of the letter of representation provided to the Auditor.

Use of this Report

This Report has been drawn up solely for the purpose given under Point 1.1 Reasons for the engagement.

The Report:

- is confidential and is intended to be submitted to the Commission by the [Beneficiary] [Linked Third Party] in connection with Article 18.1.2 of the Agreement;
- may not be used by the [Beneficiary] [Linked Third Party] or by the Commission for any other purpose, nor distributed to any other parties;
- may be disclosed by the Commission only to authorised parties, in particular the European Anti-Fraud Office (OLAF) and the European Court of Auditors.
- relates only to the usual cost accounting practices specified above and does not constitute a report on the Financial Statements of the [Beneficiary] [Linked Third Party].

No conflict of interest³ exists between the Auditor and the Beneficiary [and the Linked Third Party] that could have a bearing on the Report. The total fee paid to the Auditor for producing the Report was EUR _____ (including EUR _____ of deductible VAT).

³ A conflict of interest arises when the Auditor's objectivity to establish the certificate is compromised in fact or in appearance when the Auditor for instance:

- was involved in the preparation of the Financial Statements;

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We look forward to discussing our Report with you and would be pleased to provide any further information or assistance which may be required.

Yours sincerely

[legal name of the Auditor]

[name and title of the authorised representative]

[dd Month yyyy]

Signature of the Auditor

-
- stands to benefit directly should the certificate be accepted;
 - has a close relationship with any person representing the beneficiary;
 - is a director, trustee or partner of the beneficiary; or
 - is in any other situation that compromises his or her independence or ability to establish the certificate impartially.

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Statements to be made by the Beneficiary/Linked Third Party ('the Statements') and Procedures to be carried out by the Auditor ('the Procedures') and standard factual findings ('the Findings') to be confirmed by the Auditor

The Commission reserves the right to provide the auditor with guidance regarding the Statements to be made, the Procedures to be carried out or the Findings to be ascertained and the way in which to present them. The Commission reserves the right to vary the Statements, Procedures or Findings by written notification to the Beneficiary/Linked Third Party to adapt the procedures to changes in the grant agreement(s) or to any other circumstances.

If this methodology certificate relates to the Linked Third Party's usual accounting practices for calculating and claiming direct personnel costs declared as unit costs any reference here below to 'the Beneficiary' is to be considered as a reference to 'the Linked Third Party'.

Please explain any discrepancies in the body of the Report.	
Statements to be made by Beneficiary	Procedures to be carried out and Findings to be confirmed by the Auditor
A. Use of the Methodology I. The cost accounting practice described below has been in use since {dd Month yyyy}. II. The next planned alteration to the methodology used by the Beneficiary will be from {dd Month yyyy}.	Procedure: ✓ The Auditor checked these dates against the documentation the Beneficiary has provided. Factual finding: 1. The dates provided by the Beneficiary were consistent with the documentation.
B. Description of the Methodology III. The methodology to calculate unit costs is being used in a consistent manner and is reflected in the relevant procedures. <i>[Please describe the methodology your entity uses to calculate <u>personnel</u> costs, productive hours and hourly rates, present your description to the Auditor and annex it to this certificate]</i> <i>[If the statement of section "B. Description of the methodology" cannot be endorsed by the Beneficiary or there is no written methodology to calculate unit costs it should be listed here below and reported as exception by the Auditor in the main Report of</i>	Procedure: ✓ The Auditor reviewed the description, the relevant manuals and/or internal guidance documents describing the methodology. Factual finding: 2. The brief description was consistent with the relevant manuals, internal guidance and/or other documentary evidence the Auditor has reviewed. 3. The methodology was generally applied by the Beneficiary as part of its usual costs accounting practices.

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Please explain any discrepancies in the body of the Report.	
Statements to be made by Beneficiary	Procedures to be carried out and Findings to be confirmed by the Auditor
Factual Findings: - ...]	
C. Personnel costs <u>General</u> IV. The unit costs (hourly rates) are limited to salaries including during parental leave, social security contributions, taxes and other costs included in the remuneration required under national law and the employment contract or equivalent appointing act; V. Employees are hired directly by the Beneficiary in accordance with national law, and work under its sole supervision and responsibility; VI. The Beneficiary remunerates its employees in accordance with its usual practices. This means that personnel costs are charged in line with the Beneficiary's usual payroll policy (e.g. salary policy, overtime policy, variable pay) and no special conditions exist for employees assigned to tasks relating to the European Union or Euratom, unless explicitly provided for in the grant agreement(s); VII. The Beneficiary allocates its employees to the relevant group/category/cost centre for the purpose of the unit cost calculation in line with the usual cost accounting practice; VIII. Personnel costs are based on the payroll system and accounting system. IX. Any exceptional adjustments of actual personnel costs resulted from relevant budgeted or estimated elements and were based on objective and verifiable information. <i>[Please describe the 'budgeted or estimated elements' and their relevance to personnel costs, and explain how they were reasonable and based on objective and verifiable information, present your explanation to the Auditor and annex it to this certificate].</i> X. Personnel costs claimed do not contain any of the following ineligible costs: costs related to return on capital; debt and debt service charges; provisions for future losses	Procedure: <i>The Auditor draws a sample of employees to carry out the procedures indicated in this section C and the following sections D to F.</i> <i>[The Auditor has drawn a random sample of 10 full-time equivalents made up of employees assigned to the action(s). If fewer than 10 full-time equivalents are assigned to the action(s), the Auditor has selected a sample of 10 full-time equivalents consisting of all employees assigned to the action(s), complemented by other employees irrespective of their assignments.]. For this sample:</i> ✓ the Auditor reviewed all documents relating to personnel costs such as employment contracts, payslips, payroll policy (e.g. salary policy, overtime policy, variable pay policy), accounting and payroll records, applicable national tax, labour and social security law and any other documents corroborating the personnel costs claimed; ✓ in particular, the Auditor reviewed the employment contracts of the employees in the sample to verify that: i. they were employed directly by the Beneficiary in accordance with applicable national legislation; ii. they were working under the sole technical supervision and responsibility of the latter; iii. they were remunerated in accordance with the Beneficiary's usual practices; iv. they were allocated to the correct group/category/cost centre for the purposes of calculating the unit cost in line with the Beneficiary's usual cost accounting practices; ✓ the Auditor verified that any ineligible items or any costs claimed under other costs categories or costs covered by other types of grant or by other grants financed from the European Union budget have not been taken

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Please explain any discrepancies in the body of the Report.	
Statements to be made by Beneficiary	Procedures to be carried out and Findings to be confirmed by the Auditor
or debts; interest owed; doubtful debts; currency exchange losses; bank costs charged by the Beneficiary's bank for transfers from the Commission/Agency; excessive or reckless expenditure; deductible VAT or costs incurred during suspension of the implementation of the action. XI. Personnel costs were not declared under another EU or Euratom grant (including grants awarded by a Member State and financed by the EU budget and grants awarded by bodies other than the Commission/Agency for the purpose of implementing the EU budget). <u>If additional remuneration as referred to in the grant agreement(s) is paid</u> XII. The Beneficiary is a non-profit legal entity; XIII. The additional remuneration is part of the beneficiary's usual remuneration practices and paid consistently whenever the relevant work or expertise is required; XIV. The criteria used to calculate the additional remuneration are objective and generally applied regardless of the source of funding; XV. The additional remuneration included in the personnel costs used to calculate the hourly rates for the grant agreement(s) is capped at EUR 8 000 per full-time equivalent (reduced proportionately if the employee is not assigned exclusively to the action). <i>[If certain statement(s) of section "C. Personnel costs" cannot be endorsed by the Beneficiary they should be listed here below and reported as exception by the Auditor in the main Report of</i>	into account when calculating the personnel costs; ✓ the Auditor numerically reconciled the total amount of personnel costs used to calculate the unit cost with the total amount of personnel costs recorded in the statutory accounts and the payroll system. ✓ to the extent that actual personnel costs were adjusted on the basis of budgeted or estimated elements, the Auditor carefully examined those elements and checked the information source to confirm that they correspond to objective and verifiable information; ✓ if additional remuneration has been claimed, the Auditor verified that the Beneficiary was a non-profit legal entity, that the amount was capped at EUR 8000 per full-time equivalent and that it was reduced proportionately for employees not assigned exclusively to the action(s). ✓ the Auditor recalculated the personnel costs for the employees in the sample. Factual finding: 4. All the components of the remuneration that have been claimed as personnel costs are supported by underlying documentation. 5. The employees in the sample were employed directly by the Beneficiary in accordance with applicable national law and were working under its sole supervision and responsibility. 6. Their employment contracts were in line with the Beneficiary's usual policy; 7. Personnel costs were duly documented and consisted solely of salaries, social security contributions (pension contributions, health insurance, unemployment fund contributions, etc.), taxes and other statutory costs included in the remuneration (holiday pay, thirteenth month's pay, etc.); 8. The totals used to calculate the personnel unit costs are consistent with those registered in the payroll and accounting records; 9. To the extent that actual personnel costs were adjusted on the basis of budgeted or estimated elements, those elements were

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Please explain any discrepancies in the body of the Report.	
Statements to be made by Beneficiary	Procedures to be carried out and Findings to be confirmed by the Auditor
Factual Findings: - ...]	relevant for calculating the personnel costs and correspond to objective and verifiable information. The budgeted or estimated elements used are: — (indicate the elements and their values). 10. Personnel costs contained no ineligible elements; 11. Specific conditions for eligibility were fulfilled when additional remuneration was paid: a) the Beneficiary is registered in the grant agreements as a non-profit legal entity; b) it was paid according to objective criteria generally applied regardless of the source of funding used and c) remuneration was capped at EUR 8000 per full-time equivalent (or up to up to the equivalent pro-rata amount if the person did not work on the action full-time during the year or did not work exclusively on the action).
D. Productive hours XVI. The number of productive hours per full-time employee applied is <i>{delete as appropriate}</i>: A. 1720 productive hours per year for a person working full-time (corresponding pro-rata for persons not working full time). B. the total number of hours worked in the year by a person for the Beneficiary C. the standard number of annual hours generally applied by the beneficiary for its personnel in accordance with its usual cost accounting practices. This number must be at least 90% of the standard annual workable hours. <u>If method B is applied</u> XVII. The calculation of the total number of hours worked was done as follows: annual workable hours of the person according to the employment contract, applicable labour agreement or national law plus overtime worked minus absences (such as sick leave and special leave). XVIII. 'Annual workable hours' are hours	Procedure (same sample basis as for Section C: Personnel costs): ✓ The Auditor verified that the number of productive hours applied is in accordance with method A, B or C. ✓ The Auditor checked that the number of productive hours per full-time employee is correct and that it is reduced proportionately for employees not exclusively assigned to the action(s). ✓ If method B is applied the Auditor verified i) the manner in which the total number of hours worked was done and ii) that the contract specified the annual workable hours by inspecting all the relevant documents, national legislation, labour agreements and contracts. ✓ If method C is applied the Auditor reviewed the manner in which the standard number of working hours per year has been calculated by inspecting all the relevant documents, national legislation, labour agreements and contracts and verified that the number of productive hours per year used for these calculations was at least 90% of the standard number of working hours per year.

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Please explain any discrepancies in the body of the Report.	
Statements to be made by Beneficiary	Procedures to be carried out and Findings to be confirmed by the Auditor
during which the personnel must be working, at the employer's disposal and carrying out his/her activity or duties under the employment contract, applicable collective labour agreement or national working time legislation. XIX. The contract (applicable collective labour agreement or national working time legislation) do specify the working time enabling to calculate the annual workable hours. <u>If method C is applied</u> XX. The standard number of productive hours per year is that of a full-time equivalent; for employees not assigned exclusively to the action(s) this number is reduced proportionately. XXI. The number of productive hours per year on which the hourly rate is based i) corresponds to the Beneficiary's usual accounting practices; ii) is at least 90% of the standard number of workable (working) hours per year. XXII. Standard workable (working) hours are hours during which personnel are at the Beneficiary's disposal performing the duties described in the relevant employment contract, collective labour agreement or national labour legislation. The number of standard annual workable (working) hours that the Beneficiary claims is supported by labour contracts, national legislation and other documentary evidence. <i>[If certain statement(s) of section "D. Productive hours" cannot be endorsed by the Beneficiary they should be listed here below and reported as exception by the Auditor:</i> - ...]	Factual finding: <u>General</u> 12. The Beneficiary applied a number of productive hours consistent with method A, B or C detailed in the left-hand column. 13. The number of productive hours per year per full-time employee was accurate and was proportionately reduced for employees not working full-time or exclusively for the action. <u>If method B is applied</u> 14. The number of 'annual workable hours', overtime and absences was verifiable based on the documents provided by the Beneficiary and the calculation of the total number of hours worked was accurate. 15. The contract specified the working time enabling to calculate the annual workable hours. <u>If method C is applied</u> 16. The calculation of the number of productive hours per year corresponded to the usual costs accounting practice of the Beneficiary. 17. The calculation of the standard number of workable (working) hours per year was corroborated by the documents presented by the Beneficiary. 18. The number of productive hours per year used for the calculation of the hourly rate was at least 90% of the number of workable (working) hours per year.
E. Hourly rates The hourly rates are correct because: XXIII. Hourly rates are correctly calculated since they result from dividing annual personnel	Procedure ✓ The Auditor has obtained a list of all personnel rates calculated by the Beneficiary in accordance with the methodology used. ✓ The Auditor has obtained a list of all the relevant employees, based on which the

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Please explain any discrepancies in the body of the Report.	
Statements to be made by Beneficiary	Procedures to be carried out and Findings to be confirmed by the Auditor
costs by the productive hours of a given year and group (e.g. staff category or department or cost centre depending on the methodology applied) and they are in line with the statements made in section C. and D. above. <i>[If the statement of section 'E. Hourly rates' cannot be endorsed by the Beneficiary they should be listed here below and reported as exception by the Auditor:</i> - ...]	personnel rate(s) are calculated. For 10 full-time equivalent employees selected at random (same sample basis as Section C: Personnel costs): ✓ The Auditor recalculated the hourly rates. ✓ The Auditor verified that the methodology applied corresponds to the usual accounting practices of the organisation and is applied consistently for all activities of the organisation on the basis of objective criteria irrespective of the source of funding. Factual finding: 19. No differences arose from the recalculation of the hourly rate for the employees included in the sample.
F. Time recording XXIV. Time recording is in place for all persons with no exclusive dedication to one Horizon 2020 action. At least all hours worked in connection with the grant agreement(s) are registered on a daily/weekly/monthly basis <i>[delete as appropriate]</i> using a paper/computer-based system <i>[delete as appropriate]</i>; XXV. For persons exclusively assigned to one Horizon 2020 activity the Beneficiary has either signed a declaration to that effect or has put arrangements in place to record their working time; XXVI. Records of time worked have been signed by the person concerned (on paper or electronically) and approved by the action manager or line manager at least monthly; XXVII. Measures are in place to prevent staff from: i. recording the same hours twice, ii. recording working hours during absence periods (e.g. holidays, sick leave), iii. recording more than the number of productive hours per year used to calculate the hourly rates, and	Procedure ✓ The Auditor reviewed the brief description, all relevant manuals and/or internal guidance describing the methodology used to record time. The Auditor reviewed the time records of the random sample of 10 full-time equivalents referred to under Section C: Personnel costs, and verified in particular: ✓ that time records were available for all persons with not exclusive assignment to the action; ✓ that time records were available for persons working exclusively for a Horizon 2020 action, or, alternatively, that a declaration signed by the Beneficiary was available for them certifying that they were working exclusively for a Horizon 2020 action; ✓ that time records were signed and approved in due time and that all minimum requirements were fulfilled; ✓ that the persons worked for the action in the periods claimed; ✓ that no more hours were claimed than the productive hours used to calculate the hourly

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Please explain any discrepancies in the body of the Report.	
Statements to be made by Beneficiary	Procedures to be carried out and Findings to be confirmed by the Auditor
iv. recording hours worked outside the action period. XXVIII. No working time was recorded outside the action period; XXIX. No more hours were claimed than the productive hours used to calculate the hourly personnel rates. <i>[Please provide a brief description of the <u>time recording system</u> in place together with the measures applied to ensure its reliability to the Auditor and annex it to the present certificate⁴].</i> <i>[If certain statement(s) of section "F. Time recording" cannot be endorsed by the Beneficiary they should be listed here below and reported as exception by the Auditor:</i> - ...]	personnel rates; ✓ that internal controls were in place to prevent that time is recorded twice, during absences for holidays or sick leave; that more hours are claimed per person per year for Horizon 2020 actions than the number of productive hours per year used to calculate the hourly rates; that working time is recorded outside the action period; ✓ the Auditor cross-checked the information with human-resources records to verify consistency and to ensure that the internal controls have been effective. In addition, the Auditor has verified that no more hours were charged to Horizon 2020 actions per person per year than the number of productive hours per year used to calculate the hourly rates, and verified that no time worked outside the action period was charged to the action. Factual finding: 20. The brief description, manuals and/or internal guidance on time recording provided by the Beneficiary were consistent with management reports/records and other documents reviewed and were generally applied by the Beneficiary to produce the financial statements. 21. For the random sample time was recorded or, in the case of employees working exclusively for the action, either a signed declaration or time records were available; 22. For the random sample the time records were signed by the employee and the action manager/line manager, at least monthly. 23. Working time claimed for the action occurred in the periods claimed; 24. No more hours were claimed than the number productive hours used to calculate the hourly

⁴ The description of the time recording system must state among others information on the content of the time records, its coverage (full or action time-recording, for all personnel or only for personnel involved in H2020 actions), its degree of detail (whether there is a reference to the particular tasks accomplished), its form, periodicity of the time registration and authorisation (paper or a computer-based system; on a daily, weekly or monthly basis; signed and countersigned by whom), controls applied to prevent double-charging of time or ensure consistency with HR-records such as absences and travels as well as its information flow up to its use for the preparation of the Financial Statements.

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<i>Please explain any discrepancies in the body of the Report.</i>	
Statements to be made by Beneficiary	Procedures to be carried out and Findings to be confirmed by the Auditor
	personnel rates; 25. There is proof that the Beneficiary has checked that working time has not been claimed twice, that it is consistent with absence records and the number of productive hours per year, and that no working time has been claimed outside the action period. 26. Working time claimed is consistent with that on record at the human-resources department.

[official name of the [Beneficiary] [Linked Third Party]]

[official name of the Auditor]

[name and title of authorised representative]

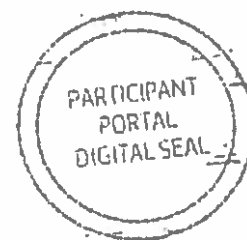
[name and title of authorised representative]

[dd Month yyyy]

[dd Month yyyy]

<Signature of the [Beneficiary] [Linked Third Party]>

<Signature of the Auditor>



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