ANNEX 1

Horizon Europe (HORIZON)

Description of the action (DoA)

Part A

Part B

DESCRIPTION OF THE ACTION (PART A)

COVER PAGE

Part A of the Description of the Action (DoA) must be completed directly on the Portal Grant Preparation screens.

PROJECT *Grant Preparation (General Information screen) — Enter the info.*	
Project number:	101178798
Project name:	UNITED CIRCLES: Networked industrial-urban symbiosis value chain demonstrators for biomaterials, C&DW, circular water loops & WWTPs, driven by Hubs 4 Circularity
Project acronym:	United Circles
Call:	HORIZON-CL4-2024-TWIN-TRANSITION-01
Topic:	HORIZON-CL4-2024-TWIN-TRANSITION-01-38
Type of action:	HORIZON-IA
Service:	HADEA/B/03
Project starting date:	first day of the month following the entry into force date
Project duration:	48 months

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PROJECT SUMMARY

Project summary

Grant Preparation (General Information screen) — Provide an overall description of your project (including context and overall objectives, planned activities and main achievements, and expected results and impacts (on target groups, change procedures, capacities, innovation etc)). This summary should give readers a clear idea of what your project is about.

Use the project summary from your proposal.

United Circles project will demonstrate, with 46 partners across 14 countries + 1 international body, three Industrial-Urban Symbiosis value chains, to upcycle of urban Food Waste, urban Wastewater Solids, and urban Construction & Demolition Waste (C&DW). To close urban and industrial water loops to reduce freshwater use in drought prone regions, and integrate energy co-generation technology in upcycling pathways. Made possible by advancing innovative technologies from TRL5 to TRL7 in combined integrated value chains, to enable zero waste cities and a decarbonised Process Industry. The value chains cover collection, sorting, upcycling and production of new upcycled products. To demonstrate how: 1) a demolish building's C&DW can be transformed into a new 2 storey 3D printed building with upcycled low-carbon cement, cement bonded particle boards, and insulation foam; 2) a waste-water treatment plant can become a resource recovery centre for all materials, water and energy, in an integrated manner. By supplying high quality gas to the local gas grid, by providing upcycled cellulose as industrial feedstock to pulp & paper industries, and by providing clean water and fertilizer for agriculture; 3) food waste in the form of used cooking oil can be upcycled in a first application of 2nd generation biorefinery to create novel fully biodegradable and food waste origin bioplastic products for complete replacement of fossil fuels. The United Circles 3 value chain demonstrators will each be integrated in a Hub 4 Circularity, that will underpin their Industrial-Urban networks governance and evolution, using advanced governance frameworks, feasibility towards financing methodologies, digital tools, social and environmental innovations, and a material and products observatory. The H4C in the proposal will enable business to territory plans, with their regional stakeholder network, that seek to expand the demonstrator integrated technologies to higher TRL levels.

LIST OF PARTICIPANTS

PARTICIPANTS

Grant Preparation (Beneficiaries screen) — Enter the info.

Number	Role	Short name	Legal name	Country	PIC
1	COO	CART	FUNDACION CARTIF	ES	999929836
2	BEN	BAST	BASTAS-BASKENT CIMENTO SANAYI VE TICARET AS	TR	893542952
3	BEN	ECOW	ECOWISE EKODENGE LIMITED	UK	915633538
4	BEN	EKOD	EKODENGE MUHENDISLIK MIMARLIK DANISMANLIK TICARET ANONIM SIRKETI	TR	986456342
5	BEN	AQUA	FCC AQUALIA SA	ES	986124020
6	BEN	INM	INNOMINE DIGITAL INNOVATION HUB NONPROFIT KFT	HU	900719303
7	BEN	RECY	RECYCLE LEBANON	LB	889749767
8	BEN	STEN	STENUM UNTERNEHMENSBERATUNG UND FORSCHUNGSGESELLSCHAFT FUR UMWELTFRAGEN MBH	AT	932786145
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10	BEN	NTUA	ETHNICON METSOVION POLYTECHNION	EL	999978142

PARTICIPANTS

Grant Preparation (Beneficiaries screen) — Enter the info.

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12	BEN	UNI	UNI - ENTE ITALIANO DI NORMAZIONE	IT	944380458
13	BEN	INT	INTRACT INOVASYON DANISMANLIK LIMITED SIRKETI	TR	891355796
14	BEN	COM	COMET GLOBAL INNOVATION, SL	ES	928228018
15	BEN	NOVA	NOVAMONT SPA	IT	998899793
15.1	AE	MBT	MATER-BIOTECH SPA	IT	951075495
15.2	AE	NOVI	NOVAMONT IBERIA S.L.	ES	882834540
16	BEN	CONT	CONTARINA SPA	IT	949398462
17	BEN	SHER	SHERPA SRL	IT	879405978
18	BEN	MIRA	MIRAT FERTILIZANTES SL	ES	946145761
19	BEN	KIMB	KIMBERLY-CLARK EUROPE LIMITED	UK	937141736
20	BEN	ZEDO	ZEDO-ZENTRUM FUR BERATUNGSSYSTEME IN DER TECHNIK DORTMUND EV	DE	956318248
21	BEN	ECOL	ECOLOCUS URBAN INNOVATIONS LAB LTD	UK	883888057
22	BEN	FPNC	FUNDACION PATRIMONIO NATURAL DE CASTILLA Y LEON	ES	953071367
23	BEN	G2H	GATE2HORIZON APS	DK	880109810
24	BEN	SCYC	UNITED NATIONS INSTITUTE FOR TRAINING AND RESEARCH	CH	997721825
25	BEN	MINO	MINOVA PROSES MADENCILIK LIMITED SIRKETI	TR	879037281
26	BEN	TEPE	TEPE BETOPAN YAPI MALZEMELERI SANAYI VE TICARET ANONIM SIRKETI	TR	908980405
27	BEN	EM&T	PERIFEREIAKO TAMEIO ANAPTYXIS ANATOLIKIS MAKEDONIAS THRAKIS	EL	886871292
28	BEN	GRUN	Z.E.H. ENERGETIKAI ES EPITOIPARI KFT	HU	879317320
29	BEN	TTB	TECH-TAKEBACK LTD	UK	879284340
30	BEN	CPD	CLAIRE POTTER DESIGN LTD	UK	879282788
31	BEN	COV	COVESTRO DEUTSCHLAND AG	DE	997433541
32	BEN	FCCM	FCC MEDIO AMBIENTE SAU	ES	951783304
33	BEN	MBL	METABUILDING ASBL	BE	883781648
34	BEN	IMS	INSAAT MALZEMESI SANAYICILERI DERNEGI	TR	938715173
35	BEN	NEG	NEGATIVE EMISSIONS CIC	UK	879180550
36	BEN	ZEOS	ZEOS RAVNANJE Z ELEKTRICNO IN ELEKTRONSKO OPREMO DOO	SI	936087249
37	BEN	LEGA	LEGA NAZIONALE DELLE COOPERATIVE E MUTUE	IT	880796376

PARTICIPANTS

Grant Preparation (Beneficiaries screen) — Enter the info.

Number	Role	Short name	Legal name	Country	PIC
38	BEN	FRAU	FRAUNHOFER GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG EV	DE	999984059
39	BEN	NBK	NOBATEK INEF 4	FR	994163865
40	BEN	ELE	Electrochaea GmbH	DE	931016283
41	BEN	CIAO	CIAOTECH Srl	IT	998763508
41.1	AE	INN	INNOVATION ENGINEERING SRL	IT	993162049
42	AP	SUPS	SCUOLA UNIVERSITARIA PROFESSIONALE DELLA SVIZZERA ITALIANA	CH	999587620

LIST OF WORK PACKAGES

Work packages

Grant Preparation (Work Packages screen) — Enter the info.

Work Package No	Work Package name	Lead Beneficiary	Effort (Person-Months)	Start Month	End Month	Deliverables
WP1	Project Management	1 - CART	121.00	1	48	D1.1 – Kick-off meeting result report D1.2 – Risk and contingency plan D1.3 – Gender and Equality plan D1.4 – Research and Data Management Plan
WP2	H4C Frameworks, Deployment & Training	3 - ECOW	413.00	1	20	D2.1 – Community of Practice building progress D2.2 – H4C Charter D2.3 – Feasibility to Finance framework for Circular Infrastructure D2.4 – Social Impact Assessment Analysis framework D2.5 – H4C Evolution progress D2.6 – Integrated Waste mapping and collection methodology D2.7 – H4C Skills Training programme design D2.8 – Online H4C Guidebook progress
WP3	Demonstrators planning, design and innovations	1 - CART	492.00	3	30	D3.1 – Demonstrator innovation design and planning D3.2 – Zero Urban C&DW innovations progress D3.3 – WWTP recovery and circular water innovations progress D3.4 – UCO & Bioplastics innovations progress

Work packages

Grant Preparation (Work Packages screen) — Enter the info.

Work Package No	Work Package name	Lead Beneficiary	Effort (Person-Months)	Start Month	End Month	Deliverables
						D3.5 – Cross-demonstrator symbiosis innovations progress D3.6 – Demonstrator innovation data synthesis for replication D3.7 – Intermediary innovations monitoring & verification
WP4	Digital Tools & Decision Support Development and Deployment	4 - EKOD	261.00	3	24	D4.1 – Data interoperability for IUS Digital Tools D4.2 – GRETA: Life Cycle Sustainability Assessment Tool D4.3 – H4C ECoP IT advancement plant to grow the H4C CoP user base D4.4 – Regenerate Hub: waste mapping and site surveys Tool D4.5 – Clusterly: Ecosystem builder for IUS networks D4.6 – IUS process designer for network scenarios D4.7 – DPP, Material Passport and IUS materials exchange Tools D4.8 – AI recommender for IUS network development
WP5	H4C Replication Activities, Social Innovation, Financing & Sustainability	6 - INM	453.00	20	48	D5.1 – H4C membership & business models progress D5.2 – IUS network scenarios wastes mapping and options screening D5.3 – Policy recommendations to incentivise and optimise IUS D5.4 – IUS network designs & best practices

Work packages

Grant Preparation (Work Packages screen) — Enter the info.

Work Package No	Work Package name	Lead Beneficiary	Effort (Person-Months)	Start Month	End Month	Deliverables
						D5.5 – H4C Social Innovation case studies D5.6 – IUS network Life Cycle Sustainability Analyses D5.7 – IUS infrastructure financing briefing & progress D5.8 – Replication agreements, pre-tech designs & financial prospectus
WP6	Demonstrator innovation deployment & insights for replication	5 - AQUA	515.00	24	48	D6.1 – Demonstrator activities, monitoring & evaluation framework D6.2 – Zero Urban C&DW demonstrations report D6.3 – WWTP recovery and circular water demonstrations report D6.4 – UCO & Bioplastics demonstrations report D6.5 – Demonstrator replication insights for scaling to TRL8 D6.6 – UC IUS Exemplary solutions for best practices sharing
WP7	Exploitation, IPR, Communication & Dissemination	14 - COM	244.00	1	48	D7.1 – Communication and Dissemination Plan incl. brand book D7.2 – United Circles materials for Communication & dissemination D7.3 – United Circles 2nd period C&D materials D7.4 – United Circles 3rd period C&D materials D7.5 – Communication & Dissemination Project events learnings

Work packages

Grant Preparation (Work Packages screen) — Enter the info.

Work Package No	Work Package name	Lead Beneficiary	Effort (Person-Months)	Start Month	End Month	Deliverables
						D7.6 – Communication & Dissemination performance report D7.7 – Standardisation landscape scan for IUS D7.8 – Exploitable results and business strategies D7.9 – UC Business models, IPR and financing D7.10 – UC Funding strategies and their implementation D7.11 – Global media campaign results report

Work package WP1 – Project Management

Work Package Number	WP1	Lead Beneficiary	1 - CART
Work Package Name	Project Management		
Start Month	1	End Month	48

Objectives
The work package seeks to ensure a proper implementation of all project-related goals, innovation, and scientific and administrative management tasks. Management and coordination encompass financial, administrative and contractual, and risk monitoring & mitigation during the entire project period.

Description
Task 1.1 Scientific project coordination and management (Task Roles ‖ Leader: ECOW ‖ Participants: All ‖ M1-M48 ‖ D1.1;D1.3;D1.4). The Coordinator CART will ensure the proper execution of the project in all scientific, technical and administrative aspects supported by the Project Steering Committee and Scientific Coordinator ECOW. The task will deliver management and review of the scientific work progress. A timely review of scheduled milestones and deliverables will allow an efficient project implementation as well as management procedures. On a regular basis, the WPLs will forward interim findings, milestones and deliverables to the coordinator who oversees the final approval of all project results before submission to the EC. Quality Assurance will be supported by ECOW. The coordinator will setup, implement and monitor GDPR and ethical issues and gender equality by taking into account all relevant European Commission guidelines. The task will also produce a research gender and equality management plan following the gender dimension aspects (section 1.2.6). Task 1.2 United Circles Research and Data Governance (Task Roles ‖ Leader: CART ‖ Participants: ECOW ‖ M1-M48). This task will establish processes and controls of data to ensure their quality and compliance to the new Horizon Europe rules regarding open data access of data (section 1.2.9). A research and data governance strategy will be developed that includes: a systematic evaluation of what research methods will be deployed to understand what datasets will be generated; what additional research data will be collected/generated; and how it will be handled during and after the project from data governance perspectives including availability, curation and preservation and data privacy (GDPR) (section 1.2.9); and to put in place checks for the reproducibility of research designs. Task 1.3 Contractual Administration (Task Roles ‖ Leader: CART ‖ Participants: All ‖ M1-M48). The task will ensure compliance with the provisions of the EC (Grant Agreement) by the Coordinator. Prior to project start, workflows, roles within the consortium and management of Intellectual Property Rights (IPR) are established and agreed in the Consortium Agreement (CA), negotiated between the partners by the coordinator for conclusion by the time the GA is signed. During project duration, CART is responsible for the complete administration of EU contractual agreements (including amendments and administrative data). Task 1.4 Risk Management (Task Roles ‖ Leader: CART ‖ Participants: ECOW ‖ M1-M48 ‖ D1.2). A risk management, mitigation and contingency plan will be developed by the consortium in order to mitigate risks and ensure contingency plans are activated where needed during the projects lifetime. Led by the coordinator, in close collaboration with the Project Steering Committee (PSC), the risk register is administrated and updated as part of each monthly PSC meeting and reported on a quarterly basis, to take into account changes to the project plan. Task 1.5 Financial Administration (Task Roles ‖ Leader: CART ‖ Participants: All ‖ M1-M48). The project coordinator establishes an appropriate liaison with the EC. To ensure financial transparency at all stages during the project's lifetime financial procedures and reports are prepared. Enabling checks on costs being within budget in relation to partners' project tasks. For this, the coordinator develops internal reporting documents on finances and monitors each partner's costs by half time of reporting periods. Followed by partners' financial reports to the EC containing cost statements and certificates overseen by the coordinator. Monitoring and control is provided on the timely distribution of the EC grant to all partners with regular transfers and accounting. Task 1.6 Administrative Management (Task Roles ‖ Leader: CART ‖ Participants: All ‖ M1-M48). The coordinator takes care of all administrative matters and is the main contact person for all partners. Being responsible for the day-to-day management the coordinator provides guidelines and templates at all stages of the project, according to the EC's provisions. All general assembly meetings are scheduled, prepared and organised together with the project

steering committee Minutes are distributed in a timely manner to all participants. All information on project results and financial matters are safeguarded and reflected in progress and final reports.

Work package WP2 – H4C Frameworks, Deployment & Training

Work Package Number	WP2	Lead Beneficiary	3 - ECOW
Work Package Name	H4C Frameworks, Deployment & Training		
Start Month	1	End Month	20

Objectives

The objectives incl. setting up the 7 H4C CoP and digital Clusterly ecosystem, formalise their governance model and extend the stakeholder network incl. setting up advisory boards for each Hub and bringing in community actors. Development of the F2F framework, social impact and community engagement frameworks, and waste mapping and collection scenario methods, and the skills & training needs assessment and programme design. The final objective is to integrate the approach into an online guidebook for H4C.

Description

T2.1 H4C & Industrial-Urban Symbiosis Community of Practice building (Task roles ‖ Leader: ECOW ‖ Participants: CART;BAST;EKOD;AQUA;INM;RECY;STEN;KENT;NTUA;UoJ;UNI;INT;COM;NOVA; CONT;SHER;MIRA;KIMB;ZEDO;ECOL;FPNC;G2H;SCYC;MINO;TEPE;EM&T;GRUN;TTB;CPD;NEG; COV;ZEOS;FRAU;NBK;MBL;IMS;CIAO;SUPS; ‖ M1-M5 ‖ D2.1)
The task will seek to setup the consortium CoP, utilising the EU CoP Playbook, and link it with the European H4C CoP through a range of knowledge sharing mechanisms. First, all partners will create H4C ECoP accounts and become active in the community. Second, the 3 IUS demonstrators will be presented with their interlinkages, by organising three webinars with workshop elements, focusing on technology innovations, attended by the entire consortium. These will also be open to external CoP parties from sister projects through H4C ECoP. Third, each of the 7 H4C will develop a presentation defining their IUS network plan presented to regional stakeholders to obtain further EOI. Fourth, the UC online ecosystem will be launched in M5 by EKOD with their available Clusterly ecosystem builder that will be further evolved in T4.5.

T2.2 H4C Charter Development (Task roles ‖ Leader: FPNC ‖ Participants: CART;BAST;ECOW;EKOD; AQUA;INM;RECY;STEN;KENT;NTUA;UoJ;INT;COM;NOVA;CONT;SHER;MIRA;KIMB;ZEDO; ECOL;SCYC;MINO;TEPE;EM&T;TTB;ZEOS;MBL;IMS;CIAO;SUPS ‖ M3-M8 ‖ D2.2)
The partners involved in United Circles H4C will seek to setup a Charter that guides the common vision for the hubs, their objectives, the associated activities and models for governance structures. To this end i) a core writing group will be setup, ii) a series of 4-5 long workshops will be organised to discuss the Charter text, iii) other consortium partners will be invited to comment, and iv) external stakeholders of each H4C as well as sister-projects and CSA will be asked for inputs.

T2.3 H4C Infrastructure Feasibility towards Financing framework (Task roles ‖ Leader: ECOW ‖ Participants: CART;AQUA;INM;RECY;STEN;NTUA;UoJ;UNI;NOVA;CONT;SHER;KIMB;ZEDO;ECOL; FPNC;G2H;SCYC;EM&T;TTB;CPD;ZEOS;NBK;SUPS‖ M3-M12 ‖ D2.3).
The framework towards deployment of new IUS demonstrators, and replication of FOAK demonstrator value chains, as well as their future scaling to TRL8, will be advanced. Each step in the framework will be clearly defined in line with the Symbiosis Readiness Levels (SRLs) approach, and its links to Technology Readiness Levels (TRLs). Objectives, methods and outcomes of each framework step will be delineated. The efforts include 1) creating frameworks for each step and associated guidance, 2) establishing common definitions, 3) screening of relevant applicable standards, 4) establishing relations with SRLs and TRLs, 5) evaluating key examples, 6) an evaluation process for key technical and non-technical barriers that may need to be overcome. Efforts will include establishment of stage-gate processes for each step based on key governance procedures. After completion the Charter will be advanced in T7.5 into a pre-standard (CWA).

T2.4 Social impact assessment and community engagement framework for a healthier environment (Task roles ‖ Leader: ECOL ‖ Participants: AQUA;RECY;UoJ;SHER;FPNC;EM&T;CPD;SUPS ‖ M3-M12 ‖ D2.4)
The task will develop the approaches in the project for advancing community and citizen group integration in the CoP to ensure participative and inclusive management, especially in relation to advancing a healthier environment. It will

also create an analytical framework to measure the social impact measurement of the Hub in terms of employment, equitability and equality in relation to achieving a healthier environment, also informing the social-LCA methods that will be advanced in T4.2 as per the GRETA digital tool. The task will extend the A H4C regions CoP developed in T2.1 to involve community actors, that will be involved in CoP workshops including social non-profits, environmental citizen groups and youth and young professionals training hubs under T5.3.

T2.5 H4C Setup, governance and decision-making processes and seed hubs (Task roles ‖ Leader: CART ‖ Participants:BAST;ECOW;EKOD;AQUA;INM;RECY;STEN;KENT;NTUA;UoJ;INT;COM;NOVA;CONT;SHER; MIRA;KIMB;ZEDO;ECOL;FPNC;G2H;SCYC;MINO;TEPE;EM&T;GRUN;TTB;CPD;NEG;ZEOS; NBK;MBL;IMS;SUPS ‖ M5-M20 ‖ D2.5)
In this task the emerging CoP around each a H4C from T2.1 will be formalised. Existing academic and industry bodies of work will be assessed that contain governance evaluations, guidelines, and recommendations for H4C and IUS networks. And a detailed stakeholder mapping will be carried out building upon the initial regional stakeholder EOI from T2.1 (M5-M8). Each host with partners will establish their H4C in a formalised structure in terms of governance and decision-making processes. Where needed setting up a new legal structure of the Hub for purposes of membership (M8-M12). The initial digital CoP will be advanced for each H4C utilising Clusterly from EcoWise and the ECoP portal from T2.1. An advisory board/steering committee for each H4C will be setup based on local kick-off events (M12-M15). The process to setup new H4Cs will be established (M5-M20), based on a seed funding process for new H4C, to be trialled in Graz, Austria by STEN, in Beirut, Lebanon by RECY, in Velenje, Slovenia by ZEOS and in Nouvelle-Aquaitane, France by NBK/INEF4. Efforts include: 1) development of a seed hub vision & mission plan in presentation form and ±10 page report, 2) rallying of regional stakeholders to commit to the plan, 3) setup of a H4C stakeholder working group that determines a proposed governance structure (informed by charter (T2.2)), financing structure, and roadmap, 4) the seed hubs will make an effort to attract local/regional financing in the 2nd year of the project.

T2.6 Integrated waste mapping method for regions and IUS networks (Task roles ‖ Leader: SCYC ‖ Participants: CART;BAST;ECOW;AQUA;RECY;STEN;NOVA;CONT;ZEDO;FPNC ‖ M10-M20 ‖ D2.6)
The task will seek to develop a systematic approach to regional mapping waste to acquire the required data for informing IUS design and innovations, economic and environmental evaluations, and investment cases. The works cover five aspects. First, screening of existing waste mapping methodologies led by ECOW. Second, develop methodological frameworks for waste quantification using SCYC regional down-casting statistical methodologies for WEEE and plastics waste data, adapted to food waste streams and bioplastics, leveraging on waste knowledge of the project partners, incl. periodic updating Third, providing guidance on how to develop simplified quality assessment protocols for urban waste characterisation and intermediaries utilising visual assessment, lab-testing and sensor-based methods by CART supported by partners with materials laboratories (e.g. BAST;AQUA;FPNC;NOVA). Fourth, providing guidance on how to develop on-the ground geographic screening protocols, combined with site-surveys mapping linked to T4.3 (RECY supported by CONT). Finally, the methodologies will be integrated to provide a combined bottom-up and top-down consistent approach to quantify and qualify waste flows, in the format of a template regional waste mapping report.

T2.7 H4C Skills & Training Programme and Implementation (Task roles ‖ Leader: STEN ‖ Participants: CART;BAST;EKOD;AQUA;INM;NTUA;UoJ;NOVA;CONT;SHER;KIMB;FPNC;G2H;SCYC;MINO;TEPE;EM&T; TTB‖ M8-M20 ‖ D2.7).
The task will carry out an assessment of skills and training needs and design the training programme for H4C. First, workshops will be held with the CoP established in T2.1 to evaluate skills and training needs for each A H4C region, informed by requirements of the T2.3 framework and the processes and methods from T2.4 to T2.6, to advance the skills requirements and needs matrix (M8-M12). Surveys will be designed to collect targeted information during the workshops, to fill in to a maximum extent the matrix on requirements/needs and finalize the needs assessment. Second, at least 10 roundtable style Focus Groups, with public and private IUS and eco-industrial park managers will be carried out, on knowledge and skills requirements for decision-making processes will be carried out, considering also contrasting them with available SPIRE-SAIS and Skills4Planet resources to better understand remaining gaps (M10-M14). The roundtable focus groups will be mostly online or face-to-face, in case these can be organized back to back with other project events (e.g. site visits). Training proposals will be contrasted in these groups, to enhance quality insights for the training framework and training programme design. Third, the results will be used to finalise and implement the training programme to support the A H4C Activities (M15-M20). Carried out as online trainings (7 x 3 half-days per H4C incl. external stakeholders). As part of the training, one final face-to-face training of three days will take place at the M18 project general assembly, to train practical skills, and discuss the relevant concepts, with 20-25 participants maximum

T2.8 H4C Online Management Guidebook (Task roles ‖ Leader: COME ‖ Participants: CART;ECOW;UoJ;ZEDO ‖ M15-M20 ‖ D2.8).
All framework results across tasks 2.2 to 2.7 will be translated into a step by step management guidebook for H4C, to expand the United Circles website and online Community of Practice. To form an online interactive set of pages for

guiding the setup and management of H4C. The framework will be tested in the replicator hubs and iterated before scaling up. Materials will be restructured, copy-edited and made visually appealing for online usage. The final online guidebook will be launched at a digital event inviting sister projects and other key circularity and IUS initiatives.

Work package WP3 – Demonstrators planning, design and innovations

Work Package Number	WP3	Lead Beneficiary	1 - CART
Work Package Name	Demonstrators planning, design and innovations		
Start Month	3	End Month	30

Objectives

The WP covers technical innovations required to advance the technologies from TRL5 to TRL7 prior to integrated deployment in the demonstrators under WP6. Efforts include innovation design and planning of activities; innovation advancement associated with each of the 3 demonstrators, and cross-demonstrator synergies, and key insights and data collection for innovation replication and scaling with replicators.

Description

T3.1 Demonstrator innovations activity planning, monitoring and evaluation (Task roles ‖ Leader: CART ‖ Participants:AST;ECOW;AQUA;EKOD;NOVA;MBT;NOVI;CONT;MIRA;KIMB;MINO;TEPE;FCCM;ELE;LEGA; ZEDO ‖ M3-M10 ‖ D3.1)
The task will setup oversight for the individual technology innovation advancement in WP3. It will discuss in workshops in M3 each of the 3 demonstrator material and technology process flow design, and update the innovation activities planning into a complete activity plan from individual innovations advancement (WP3) to integrated demonstrations (WP6). The demonstrator economics assessment KPIs will be updated from proposal stage (section 2.2) by ECOW (M3-M5). An inventory of existing and to be deployed technology assets will be made by CART (M3-M5). Demonstrator site visits will be carried out by CART to evaluate and discuss local implementation conditions (M5-M8). Technology innovation and demonstrator activities schema will be setup with initial timing estimates across WP3 and WP6. Innovation teams will be identified from leaders (AQUA;BAST;NOVA) and innovation oversight responsibilities identified across WP-leaders, coordinator (CART) and scientific coordinator (ECOW). A Monitoring & Evaluation (M&E) framework will be developed by CART with KPIs for the activities (M5-M10). The plan + M&E framework will be updated in T6.1 for the integrated demonstrations.

T3.2 zero urban C&DW demonstrator design and technology advancement (Task roles ‖ Leader: BAST ‖ Participants: CART;ZEDO;MINO;TEPE;COV;FRAU;ECOW ‖ M3-M30 ‖ D3.2).
The task will advance 5 innovative technologies in BAST;MINO;TEPE;COV;FRAU laboratories, to advance the individual technologies and design their upscaled version for integration demonstration in WP6. Collection efforts include: C&DW will be collected to BAST from a freshly demolished building in Ankara by excavator and trucks. A collection protocol will be developed by BAST;COV;ZEDO for PIR foam and a demolition company will be contracted for collection of demolition site specific PIR foam panels. ECOW will evaluate integration of MPPs & DPP's for respective products and improvements for batch waste shipment and product collection. Each compound of C&DW will be sampled by BAST researchers and characterised by physical, chemical, mineralogical and instrumental analyses. Purchasing efforts includes: Procurement and leasing of required equipment for all partners for advancement to TRL7 pre-testing at scale, and consumables for stocking and use as needed. Specific efforts for XRT-Driven Smart Sorting (MINO) include: Design and engineering works will be made for the custom designed drum type rotary breaker and XRT-driven smart sorting system; sensor options incl. XRT, XRF NIR, VIS/HIS will be advanced to evaluate new options available for integration considering federated edge AI technologies. AI protocols will be assessed for safe AI utilisation (section 1.2.4). The custom drum type rotary breaker will be tested with sample C&DW batches to assess performance of fines vs coarse fractions. The existing test-bench setup for the XRT-driven sorted from MINO will be enhanced and tested with the updated sensors and cloud coded software, for different crushed C&DW fractions. Different feedstocks are mixed and tested to evaluate performance efficiencies, prior to purchase of the full system for installation in WP6. Specific efforts for Attrition Scrubbing (MINO) include: the attrition scrubbing system is designed and engineered for large scale operation; existing physical model is updated with the different compositions of waste concrete/rubble/stone fractions as sorted, in relation to physical force impacts. Dynamic sensors feedback is developed linked to the XRT-driven smart sorting system, to enable feedback based adjustment of the scrubbing force for enhanced liberation per

batch of material. The system is made ready for integration in WP6 for demonstration. Specific efforts for Carb-Upcycled HCP (BAST) include: design of carbonation plant scaling from current setup of 1 tonnes/hour to 5 tonnes/hour size; advancement of feeding and outflow mechanism and installation; design of factor IT & sensor systems for improved carbonation reactor control; smaller reactor testing with liberated HCP to evaluate product, energy and CO2 flow; assessment of cement characteristics requirements; market certification efforts initiation for completion in WP6. Specific efforts for Alkali reactor (TEPE) include: existing process performance scaling requirements are assessed; different batches of sorted waste wood fractions are evaluated and shredded at small scale, with tests in the current TRL5 setup to evaluate smaller scale performance. A sorting protocol is developed to identify higher and lower performance woods. The parameters are used to design a new batch reactor at quadruple the size, including an evaluation of reaction surface enhancements including mixing for process acceleration; the reactor is developed and procured and tested for utilisation of received wood sub-fractions WP6; Specific efforts for Catalytic Pyrolysis of PIR foam (COV;FRAU) include: The use of a suitable catalyst will be explored; all products in the pyrolysis oil will be identified through analyses (GC-MS/FID, GCxGC, NMR, elemental analyses, GPC, ICP-OES); a distillation process will be developed for amine separation; boiling point analysis of the pyrolysis will be performed; a design made for the batch rotary kiln TRL7 process. The target is to convert a 10 kg/h pre-treated PIP foam waste stream into high value purified amines. Specific efforts for 2-storey building development include: The building design will be carried out and detailed material and product requirement calculations made; the installation steps will be documented in an integrated design and delivery practice; At the end of the task the 3D printer rental will be procured, with the 3D printing service support subcontracting service tender will be carried out at the end of the task.

T3.3 WTP, WWTP and circular water demonstrator design and technology advancement (Task roles ‖ Leader: AQUA (supported by FCCM) ‖ Participants: CART;EKOD;MIRA;KIMB;FCCM;ELE;ECOW ‖ M3-M30 ‖ D3.3)
The task will advance 6 innovative technologies in AQUA;KIMB;CART;FCCM;ELE;MIRA laboratories. Data collection efforts include: Compilation of the wastewater, industrial water, waste quality and quantity based on historical data. Samples will be recovered from each stream (wastewater, sludge, industrial wastes, biogas, urban wastes) for baseline and supplemental laboratory in AQUA;CART;FCCM accredited laboratories. Purchasing efforts includes: Procurement and leasing of required equipment for all partners for advancement to TRL7 pre-testing at scale, and consumables and materials for stocking and use as needed. Site preparation for the pilot plant installation, civil works, water and energy supply. Delivery of pilot plants for upscaling efforts in WP7. Specific efforts for coupled FO-CDI desalting (CART;AQUA) include: Design and integration of CapDI System powered by renewable energy. Existing Solar-PV system scaling assessment. The overall system will be designed, considering water treatment efficiency and energy requirements. Determination of control mechanisms for energy-efficient operation. Development of coupled system Design. Develop a comprehensive plan for integrating renewable energy systems with capacitive deionization units. Specific efforts for novel dNF membranes include (AQUA): Water regeneration using dNF membranes will be tested at bench scale (1 L/h) with real wastewater in order to evaluate the quality of the filtrate, energy consumption and to optimize the operational parameters. A filtration projection tool will be employed to identify optimal condition ranges and quality parameters Projections will enable to identify for this specific WW matrix to estimate in the design and upscale of the dNF demonstration plant the need for hydraulic and chemical cleaning strategies. Moreover, projections will include two different dNF membranes with different molecular weight cutoff and permeability, in order to identify tradeoff between energy consumption in the dNF and water quality required for the desalination cell. Specific efforts for Coupled Anammox-FBR include (AQUA, MIRAT): Preliminary tests will be carried out to optimise the magnesium extraction process from brines. To do this, we will work with the use of different chemical reagents and engineering processes, in which the pH, hardness, pressure and temperature will be controlled to maintain control of the process to generate and grow the crystals of the salts that are precipitated in a selective manner. Magnesium hydroxide slurries obtained from the seawater brines will be used for Struvite precipitation from wastewater streams. Different Mg(OH)2 products (high solids slurries and powders) extracted from brines will be developed for use within struvite precipitation processes. Preliminary tests with different Mg(OH)2 products on different wastewaters provided by AQUA will be performed. The process will be compared with the struvite precipitation obtained using MgCl2. The extracted struvite/calcium phosphate compound will be characterized. Whit all these result, a protocol for Struvite precipitation will be designed indicating the best Mg(OH)2 slurries and parameters for the optimal process. Specific efforts for H2 & CO2 enhanced methanation for P2G include (ELE;AQUA): Preliminary AD tests will be carried out by AQUA by batch test in 200ml incubators that will be continued in three digesters of 2 litres each in continuous operation fed by agri-waste to evaluate the best agrifood recipes and anaerobic digestion to optimise operating conditions. Development of a model by ELE describing the impact of different gas flow gradients on the methanation efficiency including adaptation of the nutrient feeding strategy for the biocatalyst to ensure high CO2 conversion rates during load following operation. Evaluation with AQUA & ELE of results in the context of availability and daily flows and spots of curtailed electricity as well as operational performance of electrolyser and hydrogen generation operation, and storage needs. Process water treatment will be advanced incl. pretreatment and membrane systems and adaptation of operation parameters. Advanced technology will be procured and scaled and the site delivery plan created for transport and installation in WP6. Specific

efforts for hydrothermal liquefaction include: heterogeneous input material combination to optimize the operational parameters of HTL continuous pilot. Several tests will be performed with different waste streams to develop a versatile HTL technology, able to treat very divergent waste streams that are non-recoverable nor recyclable at the moment.

T3.4 UCO & Bioplastics Demonstrator design and technology advancement (Task roles ‖ Leader: NOVA ‖ Participants: CART;MBT;NOVI;CONT;LEGA;ECOW‖ M3-M30 ‖ D3.4).
The task will set up UCOs collection at CONT and advance 4 innovative technologies in NOVA R&D laboratories supported by CART, MBT and NOVI where needed. Specific collection activities cover: Design of UCOs separate collection system with smart containers at HORECAs and festivals, incl. a DPP integrated smart deposit return scheme trial with TRACID from ECOW; Manage the logistics by planning and coordinating the transportation of feedstock (UCOs from CONT and sugars from CART) from its source to the biorefinery, addressing all regulatory, storage and loading/feeding operations. P. Purchasing efforts include: Assessment of the current MBT's facilities, utilities, processes, and equipment. Procurement and leasing of required equipment for all partners for advancement to TRL7 pre-testing at scale, and materials and consumables for stocking and use as needed. Techology innovation efforts include: Feedstock characterizations and trials at lab and pilot scale of demonstrators innovative technologies to identify optimal processing conditions for the upscaling of all four technologies to TRL7; Process R&D teams based redesign and engineering works to advance innovations from existing TRL status to TRL7; Delivery of equipment for individual technology testing and advancement in preparation for WP6 TRL7 integrated value chain demonstration.

T3.5 Cross-demonstrator symbiotic links planning and technology advancement (Task roles ‖ Leader: CART ‖ Participants: BAST;AQUA;EKOD;NOVA;MBT;NOVI;CONT;MIRA;KIMB;ZEDO;MINO;TEPE;FCCM;ELE; LEGA;ECOW‖ M8-M28 ‖ D3.5).
CART laboratories with demonstrator leader support that enable the integration of T3.2 to T3.4 linked IUS demonstrators if they were implemented in the same geography. These include WWTP recovered cellulose conversion into sugars for bio-refinery utilisation; wood conversion for bio-refining; hydrochar production from sludge for WWTP adsorbent; activated carbon production from C&DW wood; lignin extraction for phenolic resins and hydrochar production from HTL process of WTP waste streams. Specific activities cover: Process and equipment redesign from existing TRL status; material collection from demonstrators for testing and characterisation in laboratory; Procurement of required equipment for advancing lab-scale testing at TRL5, onsite validation for the recovered materials by AQUA, NOV and TEPE. This task will also explore additional IUS links derived from the synergies between demonstrators, e.g. valorisation of biomaterials for packaging and water treatment. Finally, the task will include the analysis of the results and a feasibility analysis for future up-scaling and replication in connection with WP5 activities.

T3.6 Demonstrator innovation data synthesis for replication (Task roles ‖ Leader: NOVA ‖ Participants: CART;BAST;ECOW;AQUA;INM;EKOD;NTUA;UoJ;NOVA;MBT;NOVI;CONT;SHER;ZEDO;FPNC;G2H;MINO; TEPE;GRUN;TTB;NEG;SUPS‖ M25-M30 ‖ D3.6).
The task will collect innovation design and technology insights from the 3 demonstrators to gain insights for replication. First, insights will be captured in an innovation performance assessment deliverable covering demonstrator KPI progress status. Separate reports will be drawn containing any sensitive data managed by demonstrator leaders BAST;AQUA,NOVA; available under access agreement conditions for replication studies. Second, workshops will be held between demonstrator H4C partners and replication H4C partners. Both for information exchange and condition comparison to understand technology deployment challenges.

Work package WP4 – Digital Tools & Decision Support Development and Deployment

Work Package Number	WP4	**Lead Beneficiary**	4 - EKOD
Work Package Name	Digital Tools & Decision Support Development and Deployment		
Start Month	3	**End Month**	24

Objectives
Develop a data interoperability framework for IUS and advance seven tools for H4C to support IUS network delivery. At the end of each task the respective digital tool will be made available for each a H4C for utilisation during the project, with testing and feedback carried out during the task as part of agile methodologies.

Description

T4.1 Data Interoperability for IUS Digital Tools to provide integrated use cases (Task roles ‖ Leader: UoJ ‖ Participants: CART;ECOW;EKOD;RECY;CIAO;INN;SUPS‖ M3-M10 ‖ D4.1).
The task will first evaluate use cases in IUS innovation and network development where integration of two or more tools are needed. The approaches and methods to develop H4C (T2.3 up to T2.6) and similar frameworks from the ECoP will be screened for potential specific use cases of the seven United Circles digital tools. In addition, an external digital tool screening will be carried out to advance SOA advanced awareness, especially evaluating openly available tools that could be used. Second, data structures of all the seven digital tools and taxonomies used will be evaluated. In addition, a broader scan will be carried out to evaluate open taxonomies and ontologies for IUS wastes and process mapping. In the screening touch-points of data exchanges for integrated use cases will be assessed, mapping common information to be exploited as inputs or results from one tool that can become useful inputs for another one, thus evaluating possible value added connections of software developed in WP4. Third, a new common taxonomy and data format will be formulated for interoperability between United Circles tools, and where possible external tools.

T4.2 Advancement of GRETA - Life Cycle Sustainability Assessment Tool for IUS. (Task roles ‖ Leader: SUPS ‖ Participants: ECOL;CART ‖ M5-M22 ‖ D4.2).
The task will advance an LCSA framework and implement it in an existing digital tool for LCSA developed by SUPSI, Green Targets or GRETA. The task will start with evaluating existing Life Cycle Sustainability Assessment (LCSA) works of IUS networks, covering environmental, circularity, economic and social dimensions following existing ISO standards and best practices (e.g. 2020 S-LCA guideline updates). To go BSOA by establishing standardised assessment boundaries for IUS networks for LCA, S-LCA and LCC assessment, and associated key metrics. And by identifying an approach to identify a benchmarking schema for processes and their assumptions based on the TRL situation with intermediary changes (by 2030) and a future vision (by 2040). The developed framework will be implemented in the GRETA toolsuite for LCSA to enable LCA, LCC and S-LCA scenario generation. The approach will be aligned with the provisioning of environmental, economic and social impact assessment indicators as part of step 4 of the United Circles F2F for IUS (T2.3).

T4.3 H4C ECoP IT advancement plan to grow the H4C CoP user base (Task roles ‖ Leader: INN ‖ Participants: ECOW;ZEDO;FPNC;COV;CIAO‖ M5-M22 ‖ D4.3)
The task will develop a requirements evaluation to advance the existing H4C ECoP Knowledge Platform. The task is aligned with the H4C Europe project 'Building a european Community of Practice of Hubs for Circularity' which ends in May 2026 (approx. M16 of UC). This process will start from the existing H4C Europe CSA features evolution considered at task start, and evaluate additional features incl. in relation to integration 'sockets' for other H4C specific platforms that exist or are emerging (M5-M12) (e.g. for example for internal H4C material, technology and other information management), incl. UC H4C Digital Network Ecosystem (T4.5), and general EU commission driven regional platform initiatives (e.g. EU supported S3 smart regional specialisation & Cluster Collaboration platform). To evaluate how relevant information can be automatically updated and retrieved so that the H4C EU CoP platform can be enriched in an automated or semi-automated manner, combining top-down (human driven) and bottom-up (automation driven) information acquisition. Integration 'sockets' can include direct linkages, API driven data updates, single-sign-on for users, annual or periodic bespoke database updates). The second part of the task seeks to evolve specific features within the ECoP (M12-M22), as feasible within this timeframe, such as automated user profile linking from/to the H4C ECoP platform and an open innovation section to foster collaborations between organisations.

T4.4 Advancement of Regenerate Hub waste and site survey mapping and visualisation (Task roles ‖ Leader: RECY ‖ Participants: SCYC;UoJ ‖ M5-M22 ‖ D4.4).
The task will advance regenerate explorer, a tool for regional mapping and visualisation of circularity problems and solutions and associated wastes. The existing sector taxonomy will be enhanced for site classification using the agreed taxonomy from T4.1. A linked site survey APP will develop for on-site identification by surveyors of industrial and urban facilities. It will include: processes and wastes drop-down selection; schemas for rapid semi-automated data completion; photo upload options; GPS ID and timestamping. The existing feature for ‘journeys’ will be enhanced where users tell stories to highlight existing successes to include videos, photos and written content, linked to the existing sector mapping. Finally, a module will be built for semi-automated identification of regenerative loops where scaling of processes or introducing new ones can reduce wastes and reduce regional import dependencies.

T4.5 Advancement of Clusterly for H4C (Task roles ‖ Leader: EKOD ‖ Participants: ECOW;ZEDO;MBL;CIAO;INN‖ M5-M24 ‖ D4.5).
The task will advance the online ecosystem builder Clusterly to integrate specific additional features for H4C network building, information showcasing, and exchange and communications. The following advances will be made: Existing innovations showcasing will be amended to have fields tailored specifically to IUS innovations from TRL 3 to TRL9;
A new showcasing area will be made for IUS process networks at different SRL, focusing on particular wastes, linked to technology implementations; Technology providers for IUS innovations will be invited to join the H4C network to

showcase their innovations, in collaboration with the H4C initiative; The communication groups area will be advanced to enable its use as a stepper type framework integrated with the H4C Feasibility to Financing framework.

T4.6 Advancement of IUS process designer for modelling and network scenarios (Task roles ‖ Leader: EKOD ‖ Participants: CART;ECOW;STEN;NBK‖ M5-M24 ‖ D4.6).
The task will advance the FISSAC project based IUS network design tool for evaluating process needs and flows for valorising inorganic and organic waste streams. The tool will be enriched with additional dynamic mathematical process models based on the process and waste sources data identified from project works, integrating an innovation input-output design module with data entries in a flexible characterisation module. The tool will be re-deployed in the cloud with an updated backend database and user interface. The tool will be tested for the 3 demonstrator IUS scenarios, and the associated standardised mathematical symbolic process-flow framework will be integrated in the deliverable.

T4.7 Advancement of tools for IUS Material Observatory (Task roles ‖ Leader: ECOW ‖ Participants: CART;BAST;EKOD;AQUA;UoJ;NOVA;MBT ;NOVI;CONT;MIRA;KIMB;TEPE‖ M5-M24 ‖ D4.7).
The task will advance two digital tools. First, the catalogue for document management and data exchange from CART will be advanced into a IUS process and material info exchange catalogue for IUS networks. To this end a new version of the tool information structure will be developed specifically for IUS materials and process document & dataset category entries, building upon T4.1 taxonomies. The structure will be advanced to consider different IUS network sector aspects & hierarchy levels. Guidance will be developed on the contents of each document with examples, with inputs from the waste mapping methodology (T2.6). Administrative user control panels, document encryption security, and automated document password checking will be advanced to improve security options for users to improve data sovereignty and access control. At the end of the development a catalogue will be launched for each of the demonstrator H4C and its members. Second, the TRACID tool from ECOW that allows for deployment of Digital Product Passports at product model, batch, and individual item level, will be advanced to provide for material passports and DPP deployments. The approach includes developing DPP prototypes for KIMB;TEPE;NOVA;BAST and MIRA products, and evaluating their integration in respective manufacturing lines for DPP data carrier tagging for product traceability. And advancing a new material passport module for batch shipping of wastes with an on-site MPP generation APP linked to a label printer for QR-code tagging and mobile access. The module will utilise the TRACID material libraries and be advanced incl. for UCO, processed cellulose and sorted C&DW.

T4.8 Advancement of AI recommender tool for screening material IUS valorisation routes (Task roles ‖ Leader: UoJ ‖ Participants: STEN;NTUA;SHER;FPNC;G2H ‖ M5-M24 ‖ D4.8)
The task will advance an exploration and recommendation tool utilising AI machine learning text crawling technology. Efforts will seek to make the tool universally utilisable for IUS networks delivery focusing on regions and H4C managers. First, workshops with key a H4C partners will be held to develop the use cases. Second, the backend will be advanced to incorporate new web-crawling algorithms specifically for the use case needs to establish the database. Third, the AI machine learning algorithms will be deployed on the new database and configured to consider the required conditions of the use cases. Fourth, workshops with key partners will be held for UI/UX improvements and the dashboard design will be enhanced and implemented for tool usage to enable query's within the use case context.

Work package WP5 – H4C Replication Activities, Social Innovation, Financing & Sustainability

Work Package Number	WP5	**Lead Beneficiary**	6 - INM
Work Package Name	H4C Replication Activities, Social Innovation, Financing & Sustainability		
Start Month	20	**End Month**	48

Objectives
The WP seeks to advance the 7 H4C memberships and their financial sustainability. Implement the F2F framework from steps 1 to step 8 across a range of tasks. Implement novel social innovations with community actors and citizens. And provide for country level policy recommendations to incentivise IUS.

Description
T5.1 H4C Membership extensions, business model, and continuous delivery (Task roles ‖ Leader:

INM ‖ Participants: CART;BAST;ECOW;EKOD;AQUA;IMS;RECY;NTUA;UoJ;INT;NOVA;MBT;NOVI;CONT;SHER;MIRA;KIMB;FPNC;G2H;MINO;TEPE;EM&T;GRUN;TTB;FCCM;MBL;IMS;ELE ‖ M20-M30 ‖ D5.1)
The task will continue T2.5 to further strengthen each H4C to make them resilient and work towards their financial sustainability. First, by developing the business model and financial needs of the H4C, considering initial proposal inputs (section 2.2) the governance model in place from T2.5, and all experience gained. Second, by organising at least two local/regional events per H4C for showcasing the works in United Circles with workshop driven activities to a wider network to attract more H4C members. Third, by advancing the Hub network by setting up thematic working groups for particular wastes, for evaluation on their circularisation within the emerging IUS regional network, utilising the Clusterly and ECoP capabilities (T4.3 + T4.5). Specific outreach efforts will be carried out to attract: first community actors to support local social development; second financial institutions in the region, to support each H4C with financial advisory and fundraising strengths.

T5.2 H4C wastes mapping and screening (Task roles ‖ Leader: CART ‖ Participants: BAST;EKOD;AQUA;INM;RECY;STEN;KENT;NTUA;UoJ;NOVA;MBT;NOVI;CONT;SHER;MIRA;KIMB;FPNC;MINO;TEPE;EM&T;GRUN;TTB;NEG;FCCM ‖ M20-M28 ‖ D5.2).
The task will seek to utilise the waste mapping effort utilising the T2.6 framework and T4.3 tool for the regions chosen waste types, incl. advancing demonstrator related urban and industrial wastes mapping where needed, as step 1 of the F2F framework providing a regional waste report. Subsequently, it will carry out the screening approach under F2F step 2 combining screening workshops for collection, sorting, upcycling, and production options incl. also reuse & recycling where relevant, combined with desk-based research for IUS technology options, and site visits with potential partners for providing access to waste(s) or processing them. The goal is to create a screening report containing a shortlist of technology innovations and projects that together form an integrated IUS network, including the respective demonstrator technologies. The task deliverable will summarise all H4C mapping and screening reports.

T5.3 Regional framework and policy recommendation to incentivise and optimise Industrial-Urban Symbiosis (Task roles ‖ Leader: SCYC ‖ Participants: EKOD;RECY;UoJ;SHER;ZEDO;FPNC;EM&T ‖ M25-M35 ‖ D5.3).
The task aims to identify national, regional and global policies relevant to resource-use optimisation and waste prevention in industrial networking and zero-waste entrepreneurship. The inventory will be supported by a review of published academic and scientific literature and an empirical survey performed informing about partners' and stakeholders' experiences and suggestions. Gathered information will be analysed as regards their life-cycle approach and their support or hindrance of IUS to provide policy recommendations for streamlining, amending, and improving frameworks and policies. Focusing on setting minimum standards across communities for symbiosis activities, wastes and recycled and upcycled materials to ensure a high level of sustainability to drive innovation.

T5.4 H4C IUS flow and process design (Task roles ‖ Leader: CART ‖ Participants: BAST;ECOW;EKOD;AQUA;IMS;STEN;KENT;NTUA;UoJ;NOVA;MBT;NOVI;CONT;SHER;MIRA;KIMB;FPNC;MINO;TEPE;EM&T;GRUN;TTB;NEG;SUPS ‖ M28-M36 ‖ D5.4)
The task will design extended IUS networks for the region considering the waste mapping and screening, starting from the demonstrator networks for Hubs connected to the 3 demonstrators, and their replication network analogues. First, the existing baseline flow and processes scenario will be created based on the already known status for the region for chosen waste types. Subsequently, scenarios will be developed for transforming this situation into a zero waste IUS network design, based on replication of the demonstrators, with additional screened innovations and associated IUS links from T5.2. To cover detail on additional innovative projects to United Circles, conversations will be initiated with existing technology vendors and external TRL7 demonstration innovators. Calculations will be included for the material flows at scales of TRL7, TRL8 and TRL9 operation level. Resulting in a IUS network system design for each H4C.

T5.5 H4C Social Innovation Activities (Task roles ‖ Leader: ECOL ‖ Participants: CART;BAST;ECOW;AQUA;EKOD;UoJ;COM;NOVA;MBT;NOVI;CONT;SHER;KIMB;FPNC;CPD;IMS ‖ M25-M38 ‖ D5.5).
The task will carry out the participative activities with community actors in the Hub network involved, and citizen and educational initiatives following T3.1, with 4 of the 7 H4C (ES;TR;SA;UK). Three types of activities will be deployed, fostering the involvement of local community actors and citizens as participants in the green transition. First, a series of primary schools half-day circular economy workshops will be co-designed led by the UK H4C (CPD) for ages 9 to 10 to inspire the next generation (M25-M38), focusing on Waste-water; C&DW and Food Waste, with additional language versions in Spanish and Turkish. Liaisons will be made with one school in the 4 involved H4C regions to implement these workshops. Second, workshops will be organised (M30-M35) with regional community actor organisations incl. social workplace non-profits, environmental citizen groups and young professionals training hubs, as a roundtable ideation consultation on the T5.4 IUS design ideas in relation to citizen and job benefits. Third, citizen engagement will be tested by ECOW and COME based on using the product DPPs developed in T4.6 as a tool for environmental awareness and action (M25-M34) using the citizen life-cycle events capabilities of TRACID. To provide insights when scanning the

product QR code with ‘What happens with my [waste] when I dispose/throw it/’, followed with guided mini-surveys to provide direct participative feedback to manufacturers on what change citizens would like to see. The approach will be tested based on setting up a DPP stand in Salamanca and Venice on the street to engage consumers in ES and IT for toilet rolls and bio-plastic bags.

T5.6 H4C Economic, Environmental and Social Sustainability analysis (Task roles ‖ Leader: SUPS ‖ Participants: CART;BAST;ECOW;EKOD;AQUA;INM;NOVA;MBT;NOVI;CONT;SHER;KIMB;ZEDO; ECOL;FPNC;G2H;TEPE;EM&T;GRUN;TTB;CPD;NEG;FCCM;ELE‖ M30-M44 ‖ D5.6).
The task will carry out three types of analyses for each of the IUS network designs in close relation with T5.4. First in a bi-directional effort the boundary conditions, functional unit and baseline scenario for Life Cycle Sustainability Analysis will be established, based on the designed IUS network (T5.4) (M30-M32). Second, three analyses will be carried out in parallel (M32-M44) by the respective Hubs, utilising the GRETA tool (T4.2). The economic cost-benefit analysis (M32-M40) for all IUS stages including collection, sorting, upcycling and production supported by G2H, the environmental LCA for the IUS network (M32-M40) supported by CART, and the social-LCA assessment using the survey design based on GRETA supported by ECOL (M36-M44). SUPS as owner of GRETA will supervise.

T5.7 H4C FOAK Financing outreach and lobbying (Task roles ‖ Leader: G2H ‖ Participants: CART;BAST;ECOW;AQUA;INM;EKOD;IMS;KENT;NTUA;UoJ;NOVA;MBT;NOVI;CONT;SHER;KIMB;FPNC; SCYC;TEPE;EM&T;TTB ‖ M25-M48 ‖ D5.7).
The task will have two parts. First G2H and ECOW will work on the efforts for financial lobbying (M25-M36). In this stage a broad screening will be carried out to enhance the list of potential public and private investors incl. Family Capital enterprises and small-market and mid-market funds. In parallel with screening a financial briefing paper will be created incorporating EU financial taxonomy rules, to argue the case for incorporating in the investor portfolio IUS network innovation and FOAK plant investments. This briefing paper will be used in direct outreach to prospective investors that are not typically investing in green infrastructure to engage in a dialogue for change. The second part will involve all actors in the task to seek investments at two fronts (M40-M48). To further bring TRL7 demonstrator technologies, where successfully accomplished to further TRL stages towards large scale commercialisation, and second for additional projects in H4C regions as evaluated and agreed from T5.8. The efforts will focus on networking by establishing initial contact with the financial network for each H4C with private and public investors to understand interest. Investment pitch-decks will be created from the financial prospectus as part of this outreach. Starting with any financial institutions that are H4C members following the efforts from T5.1. Each H4C will network by attending at least 2 finance focused events with potential IUS infrastructure financiers for prospecting. Where successful EOI is established, submissions of due diligence documentation will be prepared and provided.

T5.8 H4C Demonstrator replication agreements, pre-technical design and financial prospectus (Task roles ‖ Leader: INM ‖ Participants: CART;BAST;ECOW;AQUA;EKOD;KENT;NTUA;UoJ;NOVA;MBT;NOVI;CONT; SHER;KIMB;ZEDO;FPNC;G2H;TEPE;EM&T;TTB‖ M34-M44 ‖ D5.8).
The task will prepare for the further TRL7 scaling of demonstrators to upscaled TRL8 near commercial plants carrying out steps 5 to 7 of the F2F methodology. Agreements will first be created between H4C technology vendors and implementers for collaboration on IUS infrastructure scaling, covering MOU, LOI, NDA and other necessary agreements. Second, the T5.3 technical design and T5.4 economic analysis will be updated with acquiring sensitive technical parameters that can be provided under the agreements made for fine-tuning the techno-economic pre-investment design, financial condition parameters and associated investment ask. Based on this for each Hub a financial prospectus will be developed covering financial benefits, risks and mechanisms for allocating capital to establish FOAK replicator. A decision tree-based process with conflict resolution elements will for these efforts be designed for guidance at the start of the task.

Work package WP6 – Demonstrator innovation deployment & insights for replication

Work Package Number	WP6	**Lead Beneficiary**	5 - AQUA
Work Package Name	Demonstrator innovation deployment & insights for replication		
Start Month	24	**End Month**	48

Objectives
Validation of the sustainable and innovative technologies scaled up during the project in a relevant industrial environment as IUS demonstrators in 5 different sectors under P4P initiative (Cement, P&P, Biochemical, Water and Chemical)

linked to H4C. Activities will be planned in detail with a M&E framework for the staged implementation and final KPIs and organogram. The demonstrators will be implemented on the respective sites ES,TR,IT to achieve TRL7 level demonstrations. Insights will be collected for each H4C replicator on the results to feed into WP4 efforts. Overall results will be synthesised into exemplary case studies for use in the EU CoP.

Description

T6.1 Demonstrator activities monitoring and M&E framework (Task roles ‖ Leader: AQUA ‖ Participants: CART;BAST;EKOD;NOVA;MBT;NOVI;CONT;MIRA;KIMB;ZEDO;MINO;TEPE;LEGA‖ M24-M48 ‖ D6.1).
The task will setup oversight in the shift from individual technology innovation (WP3) to integrated demonstration (WP6). It will carry out first a stock-take to confirm the demonstrator activity plan following innovation efforts across WP3, with adjustments where needed. Second, it will update the Monitoring & Evaluation (M&E) framework for all TRL7 demonstration activities across T6.2 - T6.5. The activity plan + M&E framework will include all updated integrated planning steps, activities & events, any final procurement requirements, responsibilities and communications (M24-M30). The activities plan + M&E framework will be deployed (M30-M48) to monitor activities, acquire feedback, and keep demonstrations on track in a systematic and methodological manner.

T6.2 – T6.4 Demonstrator deployment works. The demonstrators will be implemented in their corresponding selected demo sites in order to validate the technologies in a relevant industrial environment. The tasks will carry out the following activities: Demonstrator sites visits with all involved partners; Evaluate all received equipment from T3.2 to T3.4 incl. final procurement where needed. Site preparation, regarding civil works, plumbing, and electrical works, installation, and assembly of the process units. Initial testing of demonstration setup at TRL7. Problem solving and iterations to ensure operations. Carrying out TRL7 demonstrators; collection of results and monthly reporting to task participants and WP leader AQUA and coordinator CART; Ending of testing of demonstration setup.

T6.2 WWTP resource recovery and circular water loops demonstrator deployment (Task roles ‖ Leader: AQUA ‖ Participants: CART;MIRA;KIMB;ELE;FCCMA ‖ M30-M48 ‖ D6.2).
The integrated deployment of all technologies scaled from T3.3 will be carried out. The coupled FO-CDI desalting (AQUA;CART) demonstrator plant for 500 L/d will be integrated with CDI for draw solution regeneration, and the performance evaluated at KIMB P&P plant for sustainable water treatment at demonstrator scale. The stack will be deployed and the renewable energy prototype will be implemented, including solar-PV coupling and energy recovery system. The commissioning stage will include hydraulic, mechanical, and electrical tests to verify the proper functioning of the technologies and their correct integration (FO+CapDi). Expected results include optimization of the FO process, evaluation of CDI, identification of optimal operating conditions, validation of the membrane fouling prediction model to ensure reliability and feasibility. The RBF filter cellulose upcycling demonstrator plant (AQUA;KIMB) will be deployed, to harvest and upcycle 150 g of cellulose/m3 of municipal wastewater and test removal 85% of suspended solids. The technology will be coupled with thermal hygienization procedure (extraction, alkalization and bleaching) to upcycle the processed cellulose, and also implemented in the KIMB P&P WW treatment process. After the process, the quality of the resulting cellulose will be analysed to ensure that it meets the parameters required for introduction into KIMB´s process for upcycled toilet paper production. The Coupled-Anammox-FBR (AQUA; MIRA) with a demonstrator plant of a capacity of 18 tonnes/year using magnesium hydroxide slurries obtained by AQUA as suitable reagents. Different Mg(OH)2 products (high solids slurries and powders) extracted from brines will be developed for use. The AD waste flow will be pretreated by the ELAN® process, for partial nitrification and anammox performed in an FBR with granular biomass. Followed by phosphorus recovery as struvite, using controlled crystallization by adding magnesium, based on a homogenising tank from the ELAN reactor, a frustoconical decanter, and pumping of pre-crystals to a crystallizer by recirculation pump following filtering. The resulting obtained nitrogen and struvite will be tested. Control strategies of the coupled system will be evaluated. The resulting nutrients will be utilised by MIRAT and lab tested at quality in accordance with the regulations established (EU 2021/2086), with strategies deployed for optimising quality. The fertilisers produced will be applied in controlled environment in real agriculture fields, working with different crops during a season in a randomised controlled trial to validate the agronomic value of the novel product. The H2 & CO2 enhanced methanation for P2G (ELE;AQUA): the reactor will be realised at Salamanca WWTP following preparation for shipment in WP3. After erection, implementation of the process water purification system, cold and hot commissioning of the demonstrator, the methanation process of load following operation will be validated through long term operation. The results will be benchmarked to 98% CO2 to CH4 and gas composition will have to meet the legal prerequisites to be injected into the gas grid. The methanation water purification process operating conditions for the cleaning unit will be validated. The Novel dNF membranes (AQUA;FCCM;CART): The demonstrator plant system will have a capacity production of 2 m3/day UWW. Lab quality of effluent will be fully assessed with requirements of irrigation regulatory standards. Water produced will be used to irrigate the green areas of the WWTP, WTP, and for the Agricultural sector, with different qualities of water produced vs state of the art tertiary treatment. Different hollow fiber NF membranes

will be tested: dNF40 of 400 Daltons and the dNF80 of 800 Daltons. On a biweekly basis operating conditions will be varied: i) increase in permeate flow from 15 LMH to 25 LMH; ii) increase in recovery from 70 to 90%; iii) decrease in cross flow from 0.5 to 0.2 m/s; iv) increase in cleaning intervals from 24 to 48h; v) increase in filtration cycle time from 30 minutes to 1 hour. Water reuse for irrigation for irrigation will undergo a remineralization (if necessary) and chlorination process to guarantee its use in irrigation if needed. The Hydrothermal liquefaction (HTL) (FCCM): will be deployed in a 5kg/h capacity demonstrator to process the bio-stabilised waste fraction as well as other waste streams that currently end up being landfilled. The upgraded process will be tested with variable energetic value inputs compositions and degrees of wetness to evaluate drying requirements for performance, and assesss the energy, material and carbon emission flows from the updated HTL process design.

T6.3 Zero urban C&DW IUS demonstrator deployment (Task roles ‖ Leader: BAST ‖ Participants: CART;ZEDO;MINO;TEPE;COV;FRAU‖ M30-M48 ‖ D6.3).
The task will follow from T3.2 to convert 400 tons of C&DW of a freshly demolished building into a new construction. First, 400 tonnes will be collected by Bastas and brought to the plant. Material will be sorted into concrete rubble, brick, tile, ceramic, glass, wood, plastic and foam. Mineral based material characterized by Bastas according to EN standards. (i) Sorted concrete will be sorted again into aggregate and hydrated cement paste (HCP). Roughly 50 tons of sorted HCP will be crushed into 1-5mm and carbonated by the reactor. Carbonated HCP will be ground together with clinker and gypsum for blended cement design studies and production. EN 197-6 tests will be applied to ensure the quality. The blended cement will then be used in wood chip panel and 3D concrete mortar production. Sorted aggregate will be tested according to EN 12620 standard and utilized in 3D concrete mortar production. (ii) Sorted brick, tile, ceramic and glass will be ground together with raw meal according to its chemical requirement and fed into the rotary kiln for clinker production. (iii) Sorted wood parts will be characterized and utilized as wood-cement composite for wood chip panel, floor and roof parts production. The composite products will then be used in 3D printed construction. (iv) Sorted plastic parts will be recycled by conventional methods to gain plastic pellets. The pellets will be used in PVC window and door production by plastic injection technique, to be implemented into 3D construction. (v) Sorted foam will be compressed and transported to Covestro to be recycled for insulation foam production. The foam will be produced based on an optimised procedure for the catalytic pyrolysis of PIR foams will be utilized in order to produce at pilot scale the amount of crude amine/ required. The distillation process for the product mixture of the up-scaled pyrolysis will be developed by FRAU in cooperation with Covestro, after optimisation the purification process will then be carried out at FRAU where the required equipment is available. The insulation foam will be transported back to Bastas to be used in 3D construction. (vi) A 50 m2 two-storey real scale building will be designed and printed by a large-scale 3D printer for validation of the products in a real environment with the solutions/materials developed in this task. Columns, beams, floor and stairs will be 3D printed. Prefabricated wood chip panels to be used as walls, wood chip floor parts will be used like parquet, wood-chip roof parts will be used to complete the roof. Prefabricated PVC windows and door will be implemented during construction. Insulation foam will be used between wood chip panels. A two-storey building will be achieved at the end of the demo.

T6.4 UCO & Bioplastics Demonstrator deployment (Task roles ‖ Leader: NOVA ‖ Participants: CART;NOVI;CONT;SHER;LEGA‖ M30-M48 ‖ D6.4).
The task will include MBT multi-purpose and multi-feedstock biorefinery set up and operation: the goal of this subtask is to finalise the upgrade of MBT biorefinery according to the redesign and engineering works carried out in Task 3.4 and operate the plant to demonstrate all the innovative technologies and validate all the targeted products with key stakeholders. CONT will supply UCOs collected from HORECAs and festivals; MBT, with NOVA support, will coordinate the project workflow and acceptance tests with each technology supplier, and will oversee the assembly work, including the installation of the automation, monitoring and safety systems; MBT will integrate the upgraded systems with the existing infrastructure while maintaining the system synergy and verifying the proper functioning of all equipment in compliance with design specifications through testing, batch testing, and functional checks. MBT will verify the proper installations of the utility connections such as water, feedstock feeding, heat and electricity, and their proper functioning according to the desired targets. Once all systems have been implemented, MBT will start the demo plant operation. The task will also carry out the production of biopolyesters and biomaterials and validation of all the bioplastic demonstrator targeted products: in parallel to ST6.2.1, NOVA will deploy the synthesis of the novel biodegradable AA-PES with more than 60% of RRM from a process of esterification and polycondensation exploiting lcDCAs and 1,4-bioBDO obtained from 2nd generation feedstock. The biopolymers recipes and the processing conditions will be tailored to obtain biopolyesters with rheological, mechanical, physico-chemical properties superior in terms of barrier and surface properties to those of benchmark biopolyesters, also prepared within this task starting from benchmark building blocks. The task also involves studying the characterization of biopolyesters using various tests and standards, including physico-chemical, mechanical, biodegradation, and rheological properties, to inform the development of NOVA formulations for the targeted final applications. NOVA will design biodegradable and compostable biomaterial formulations including the AA-PES and additives aiming at tuning mechanical, rheological and physico-chemical properties, and the most suitable processing conditions, and will characterise the different biomaterials

obtained, their melt flow rate (according to ASTM D1238) and rheological properties (by means of a capillary rheometer according to ASTM D3835). The outputs of the tests will be compared with respect to benchmark biomaterials. The AA-PES based biomaterials will be then validate into the targeted final applications (shoppers; OFMSW collection bags; food packaging; serviceware; mulch films) through the involvement, in collaboration with SHERP and LEGA, of plastic converters and end-users from the agro-food sector (HORECA; retailers; food producers; farmers) with the aim of setting up profitable IUS value chains. NOVA will also validate the use of the biochar obtained at MBT to produce biodegradable in soil infill formulations suitable for synthetic turf to enhance their resistance and lifespan and avoid microplastic pollution. Samples of the obtained infill grade will be provided to final users for demo test. Alternative valorisation routes for the obtained biochar will be also explored (agronomical, dye, soil amendment). Finally, the performance of the biostimulants obtained at MBT from cellular hydrolysis will be tested by NOVA on agronomically relevant plants (e.g. leaf growth, root elongation, aerial biomass, stress resistance) in 1 growing season-controlled trial field plot.

T6.5 Demonstrator replication insights for H4C (Task roles ‖ Leader: CART ‖ Participants: BAST;EKOD;AQUA;INM;NTUA;UoJ;NOVA;MBT;NOVI;CONT;SHER;MIRA;KIMB;ZEDO;FPNC;G2H;MINO; TEPE;GRUN;TTB;NEG‖ M35-M45 ‖ D6.5).
The task will start where T6.2, T6.3, T6.4 ends to provide for key insights at technical, economic, environmental and social levels on the deployment of the three IUS demonstrator demonstrators. This will include the results of the M&V plan developed in T6.1 based on the established characteristics of each process and technology and their integration in the demonstrator sites. The technology providers will deliver to the task leader CART systematic required monitoring dataset inputs for verification purposes starting from M38 also involving the 3 demonstrator leaders R&I teams. In this manner a quality-controlled verification is established with specific attention to replicability. The data driven insights will allow for updating the assessment for the replication study of the First of a Kind scaling of the demonstrators (T3.5). Each key demonstrator partner will work closely together with the replicator H4C to establish the financial case for a scaled investment within a regional context based on their place-based conditions.

T6.6 Demonstrator solution assessments to strengthen the European IUS community of practice (Task roles ‖ Leader: ZEDO ‖ Participants: CART;BAST;AQUA;COM;NOVA;MBT;NOVI;ZEDO ‖ M43-M48 ‖ D6.6).
The task will ensure that the outputs from Task 6.2 to 6.5 are translated into a uniform communicable format for standardization and benchmarking (incl. efforts), so as to form reference results from the project 3 demonstrators, as part of the exemplary solutions, to aid in communication with the wider community of stakeholders. The output will be a series of consolidated information sheets for each test with visualisations covering where applicable environmental, social, and economic performance using KPI's. This will be related to Impacts as expected in the proposal (section 2.1).

Work package WP7 – Exploitation, IPR, Communication & Dissemination

Work Package Number	WP7	**Lead Beneficiary**	14 - COM
Work Package Name	Exploitation, IPR, Communication & Dissemination		
Start Month	1	**End Month**	48

Objectives
Carry out all communication, dissemination; Review commercial/business exploitation strategies and plans; Provide coaching and advisory services connected to exploitation strategies and plans; Advice on securing funding for realization of commercial/business exploitation plans; standardisation activities to strengthen IUS.

Description
T7.1 Communication and Dissemination planning, monitoring and materials (Task roles ‖ Leader: COME ‖ Participants: CART;ECOW ‖ M1-M48 ‖ D7.1 to D7.4). The Communication and Dissemination Strategy (C&D) will be developed for M6 and updated every six months following the GA. The plan will identify and plan communication and dissemination opportunities, targeted audiences, stakeholder groups, related stakeholder interests, key messages, and the tools to reach them. Activities will be defined in the plan based on a framework of opportunities for informing, engaging, consulting, collaborating, and decision empowerment. A set of key performance indicators will be set out as part of the plan, as initially defined in sections 2.2 and 2.3, to assess that it is achieving its expected dissemination and communication impact to adapt activities where needed. Progress against indicators will be reported as part of the regular reporting process. A contingency plan

will envisage possible alternatives if distinct activities are underperforming. Further details on the communication and dissemination strategy, as well as the inclusion of the user engagement strategy, are provided in the impact section.

T7.2 Stakeholder network development and communication and dissemination project events (Task roles ‖ Leader: COME ‖ Participants: ALL ‖ M6-M48 ‖ D7.5).
The aim of the United Circles stakeholder community is both to participate in the project and to link it to EcoP (TT-01-16), European and global initiatives (section 1.2 Aspect 8), to reach at least 250 active stakeholders from existing IS, IUS, and eco-industrial parks across all P4P industries. The task will develop a strategy for stakeholder and intended user engagement events aligned with activities in other tasks (T2.1, T2.5, T5.1, T5.4). A CRM-based network database with registration on the project website will be created to facilitate engagements (M6). The project communication events will complement the actions carried out in T5.5 regarding social change actions (concept aspect 8). In line with social innovations, involving local communities with participatory events where the project raises awareness is crucial. Therefore, events with street stands and the involvement of city councils, local community actors, organisations and stakeholders are essential. Specific dissemination events are interlinked with the work carried out in the technical and social WPs and will include: 1) Four joint IS, IUS and circularity knowledge exchange forums will be proposed to this end with the sister and cousin projects as half-day to day-long physical-virtual conferences (similar model as synergy fora of Sustainable Places); 2) Six one-day innovation dissemination workshops consisting of stakeholder panels, innovation showcase presentations (from United Circles & sister projects) and panel debates, with open online participation. Aiming to reach a total of 600 stakeholders; 3) At least three high-level policy and sector workshops and panels as part of European and EU-sponsored events related to the Industrial Urban Symbiosis and the Circular Economy; and 4) Webinars for each of the 15 digital and technical innovations (section 2.2). Specific budgets have been reserved for these events with the respective partners. Results will be captured in report updated every project period and integrated into EU reporting.

T7.3 Stakeholder Oriented Communication & Dissemination Activities (Task roles ‖ Leader: COME ‖ Participants: All ‖ M6-M48 ‖ D7.6).
Specific communication actions will be carried out to raise awareness of the project among all identified target groups (see section 2.2). Support will be given to the activities framed within the social innovations since the establishment of synergies between these innovations complements and favors more outstanding communication and dissemination of the project. All partners will perform dissemination activities focusing on large-scale sharing of knowledge generated in the project (see section 2.2 for details). Specific actions include: 1) Scientific Publications: at least 15 peer reviewed papers in journals and/or peer reviewed conference in line with the data management plan (fully open access), 2) Industry/Trade Publications: at least 15 industry/sector publications in magazines 3) Fairs, Conferences, and exhibitions: Participation in fairs, workshops, and events with papers and/or booths with public disseminations materials with attendance to at least 80 events

T7.4 Standardisation landscape scan and CWA delivery (Task roles ‖ Leader: UNI ‖ Participants: ECOW;STEN;COM;ZEDO;SCYC‖ M6-M30 ‖ D7.7).
The task will seek to advance the standardisation works for industrial-urban-symbiosis in general, and in particular the feasibility to finance methodology. The approach is to carry out a standardisation landscape scan of existing standardisation committees from CEN/ISO/IEC and evaluate who is currently working on topics relating to IUS, the concept of H4C, and to upcycling of urban wastes into industrial feedstocks. The task will also carry out, in liaison with the Hubs4Circularity CSA projects and sister projects, a standardisation roundtable event and an external stakeholder survey, to collect key Process industry actor insights so as to evaluate existing standardisation gaps. Finally, it will utilise the understandings to initiate the advancement of the feasibility to finance methodology, taking the T2.3 result in M12, as a formalised CEN WORKSHOP AGREEMENT (CWA) proposed to CEN. This year long proposed (if accepted by CEN) formalisation process as a pre-standard will allow for rigorous comments and external actor commenting and involvement to improve the robustness, quality, usage and credibility of the methodology as a guidance for H4C.

T7.5 Collection and reviewing of partners commercial/business exploitation strategies (Task roles ‖ Leader: G2H ‖ Participants: CART;BAST;ECOW;EKOD;AQUA;INM;RECY;UoJ;COM;NOVA;MBT;NOVI; CONT;SHER;MIRA;FPNC;MINO;TEPE;TTB;ELE;CIAO;SUPS ‖ M4-M26 ‖ D7.8).
The task will provide for a comprehensive overview of the individual partners commercial/business strategies and plans for their exploitable results. Based on the collection of partners commercial/business strategies and plans for exploitation of project results, individual strategies and plans will be reviewed with respect to required interconnection between parties in the supply/value chain and other exploitation strategies and plans. Assumption regarding funding requirements will be collected also from each of the partners. The task will be supported by workshops addressing: 1) Exploitable results identification, 2) Characterization and preliminary ownership, 3) Preliminary business models.

T7.6 Coaching and advisory services for business models, IPR and financing for business

exploitation and circular interdependencies (Task roles ‖ Leader: G2H ‖ Participants: CART;BAST;ECOW;EKOD;AQUA;INM;RECY;NTUA;UoJ;COM;NOVA;MBT;NOVI;CONT;SHER;MIRA;FPNC; MINO;TEPE;EM&T;TTB;ELE;CIAO;SUPS‖ M18-M28 ‖ D7.9).
The task will seek to develop comprehensive exploitation strategies and create an overview of realistic and feasible funding opportunities and challenges. The task is structured through coaching and advisory services will be provided to the individual partners engaged in exploitation of project results, based on individual need assessments. The coaching and advisory services will include advice on structuring the organisational setup and/or agreements connected to the supply/ value to meet requirements from potential funding parties. The coaching and advisory services includes the following: a) Legal and organizational set up b) IPR protection strategies, Freedom to Operate analysis and licensing strategies (if relevant) c) Budgeting and liquidity analysis d) Financing options and access to funding strategies. IPR aspects will include related issues and background knowledge, IP management (e.g. trademarks, licenses, patents rights) and IPR ownership in collaboration. Following completion of coaching and advisory services for a) to d) a follow-up engagement will be provided to develop individual operational business models for the exploitation of each / each collection of project results, and associated financial budgets and funding strategies.

T7.7 Funding strategies and their implementation management (Task roles ‖ Leader: G2H ‖ Participants: CART;BAST;EKOD;AQUA;INM;KENT;NTUA;UoJ;COM;NOVA;MBT;NOVI;MIRA;FPNC;TEPE;EM&T;TTB; CIAO‖ M25-M48 ‖ D7.10).
This task focuses on providing a series of operational innovation focused infrastructure funding strategies, and secondly to support the realization of the funding strategies. In the first part, coaching and advisory services will be provided for the implementation of planned funding strategies. For each case or combination of cases different financial instruments will be examined. The potential funding sources will among others include: 1) Debt: Secured, unsecured, subordinated (subordinated being low ranking behind other debt), debt with attached equity related feature (warrants); 2) Equity: Common or preferred stock. Later giving shareholders a preference such as dividend; 3) Grant: National or EU type of grants. After the funding strategies are created, the task will support individual legal entities in the process of realising the exploitation plans and funding strategies. The support will include assistance in preparing the material required for attracting the required funding. As needed, executive summary support for funding application/ the negotiation process to investors will be provided.

T7.8 Global Media Campaign for Hubs for Circularity (Task roles ‖ Leader: SCYCLE ‖ Participants: ECOW;AQUA;UoJ;COM;NOVA;MBT;NOVI;IMS ‖ M36-M48 ‖ D7.10).
The task will seek to elevate the communication and dissemination efforts carried out under T7.1 to T7.3 to a global level, supported by partner UNITAR (SCYCLE) as a United Nations. UNITAR can guarantee an induction of the elaborated recommendations for minimum standards across communities for symbiosis activities, wastes and recycled and upcycled materials, as defined in task 5.3 by M35, into the international community through its membership in observership in many international regimes and fora. First, the task would identify based on inputs to date in the project, and in particular from T5.3, through partner workshops, the global recommendations to be communicated in respective fora. Second, it will create a communicable short briefing material on these messages. Third, the opportunity for organising an efficient media presentation will be evaluated to take place at UN-Headquarters in New York and the UN in Geneva, inviting official country representatives as well as media representatives. Finally, across the task, UNITAR will support involved partners periodically about necessary institutional contacts to relevant actors from industry, international cooperation and research, to present and anchor the recommendations in the international process.

STAFF EFFORT

Staff effort per participant

Grant Preparation (Work packages - Effort screen) — Enter the info.

Participant	WP1	WP2	WP3	WP4	WP5	WP6	WP7	Total Person-Months
1 - CART	30.00	21.00	60.00	17.00	28.00	26.00	8.00	190.00
2 - BAST	2.00	8.00	50.00	5.00	15.00	62.00	4.00	146.00
3 - ECOW	10.00	25.00	5.00	30.00	10.00		5.00	85.00
4 - EKOD	3.00	24.00	20.00	38.00	36.00	22.00	6.00	149.00
5 - AQUA	2.00	10.00	24.00	8.00	12.00	40.00	5.00	101.00
6 - INM	2.00	10.00	1.00		35.00	1.00	4.00	53.00
7 - RECY	2.00	15.00		20.00	16.00		4.00	57.00
8 - STEN	2.00	20.00		5.00	8.00		3.00	38.00
9 - KENT	2.00	4.00			4.00		2.00	12.00
10 - NTUA	2.00	15.00	1.00	5.00	20.00	1.00	4.00	48.00
11 - UoJ	2.00	16.00	3.00	34.00	20.00	3.00	5.00	83.00
12 - UNI	2.00	4.00					18.00	24.00
13 - INT	2.00	8.00			5.00		4.00	19.00
14 - COM	2.00	12.00			3.00	2.00	38.00	57.00
15 - NOVA	2.00	6.00	50.00	5.00	8.00	40.00	5.00	116.00
15.1 - MBT			10.00		1.00	20.00	2.00	33.00
15.2 - NOVI			5.00		1.00	5.00	2.00	13.00
16 - CONT	2.00	6.00	30.00	5.00	8.00	30.00	4.00	85.00
17 - SHER	2.00	15.00	2.00	2.00	18.00	3.00	4.00	46.00

Staff effort per participant

Grant Preparation (Work packages - Effort screen) — Enter the info.

Participant	WP1	WP2	WP3	WP4	WP5	WP6	WP7	Total Person-Months
18 - MIRA	2.00	5.00	20.00	2.00	4.00	14.00	3.00	50.00
19 - KIMB	2.00	5.00	10.00	2.00	10.00	25.00	2.00	56.00
20 - ZEDO	2.00	10.00	9.00	4.00	6.00	15.00	4.00	50.00
21 - ECOL	2.00	16.00		2.00	18.00		2.00	40.00
22 - FPNC	2.00	25.00	2.00		15.00	2.00	6.00	52.00
23 - G2H	2.00	4.00	2.00	2.00	15.00	2.00	30.00	57.00
24 - SCYC	2.00	20.00		4.00	18.00		9.00	53.00
25 - MINO	2.00	4.00	65.00	5.00	3.00	55.00	3.00	137.00
26 - TEPE	2.00	4.00	30.00	5.00	6.00	30.00	3.00	80.00
27 - EM&T	2.00	6.00			10.00		3.00	21.00
28 - GRUN	2.00	8.00	2.00		20.00	2.00	6.00	40.00
29 - TTB	2.00	8.00	2.00		14.00	2.00	8.00	36.00
30 - CPD	2.00	6.00			8.00		2.00	18.00
31 - COV	2.00	2.00	8.00	2.00		10.00	1.00	25.00
32 - FCCM	2.00		25.00		5.00	40.00	2.00	74.00
33 - MBL	2.00	8.00		2.00	3.00		3.00	18.00
34 - IMS	2.00	8.00			10.00		5.00	25.00
35 - NEG	2.00	5.00	3.00		15.00	3.00	2.00	30.00
36 - ZEOS	2.00	18.00					2.00	22.00
37 - LEGA	2.00		5.00			15.00	2.00	24.00
38 - FRAU	2.00	2.00	11.00			15.00	2.00	32.00

Staff effort per participant

Grant Preparation (Work packages - Effort screen) — Enter the info.

Participant	WP1	WP2	WP3	WP4	WP5	WP6	WP7	Total Person-Months
39 - NBK	2.00	16.00		6.00			2.00	26.00
40 - ELE	2.00		35.00		2.00	30.00	3.00	72.00
41 - CIAO	2.00	8.00		4.00			8.00	22.00
41.1 - INN				23.00				23.00
42 - SUPS	2.00	6.00	2.00	24.00	23.00		4.00	61.00
Total Person-Months	121.00	413.00	492.00	261.00	453.00	515.00	244.00	2499.00

LIST OF DELIVERABLES

Deliverables

Grant Preparation (Deliverables screen) — Enter the info.

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EU classified —RESTREINT-UE/EU-RESTRICTED, CONFIDENTIEL-UE/EU-CONFIDENTIAL, SECRET-UE/EU-SECRET under Decision 2015/444

Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D1.1	Kick-off meeting result report	WP1	1 - CART	R — Document, report	SEN - Sensitive	2
D1.2	Risk and contingency plan	WP1	1 - CART	R — Document, report	SEN - Sensitive	3
D1.3	Gender and Equality plan	WP1	1 - CART	R — Document, report	SEN - Sensitive	5
D1.4	Research and Data Management Plan	WP1	3 - ECOW	R — Document, report	SEN - Sensitive	6
D2.1	Community of Practice building progress	WP2	20 - ZEDO	R — Document, report	PU - Public	5
D2.2	H4C Charter	WP2	3 - ECOW	R — Document, report	PU - Public	8
D2.3	Feasibility to Finance framework for Circular Infrastructure	WP2	3 - ECOW	R — Document, report	PU - Public	12
D2.4	Social Impact Assessment Analysis framework	WP2	21 - ECOL	R — Document, report	PU - Public	12
D2.5	H4C Evolution progress	WP2	1 - CART	R — Document, report	SEN - Sensitive	15
D2.6	Integrated Waste mapping and collection methodology	WP2	24 - SCYC	R — Document, report	PU - Public	20
D2.7	H4C Skills Training programme design	WP2	8 - STEN	R — Document, report	PU - Public	20
D2.8	Online H4C Guidebook progress	WP2	14 - COM	R — Document, report	PU - Public	20

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Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D3.1	Demonstrator innovation design and planning	WP3	1 - CART	R — Document, report	SEN - Sensitive	8
D3.2	Zero Urban C&DW innovations progress	WP3	2 - BAST	R — Document, report	SEN - Sensitive	30
D3.3	WWTP recovery and circular water innovations progress	WP3	5 - AQUA	R — Document, report	SEN - Sensitive	30
D3.4	UCO & Bioplastics innovations progress	WP3	15 - NOVA	R — Document, report	SEN - Sensitive	30
D3.5	Cross-demonstrator symbiosis innovations progress	WP3	1 - CART	R — Document, report	PU - Public	28
D3.6	Demonstrator innovation data synthesis for replication	WP3	1 - CART	R — Document, report	PU - Public	30
D3.7	Intermediary innovations monitoring & verification	WP3	1 - CART	R — Document, report	SEN - Sensitive	18
D4.1	Data interoperability for IUS Digital Tools	WP4	11 - UoJ	R — Document, report	PU - Public	10
D4.2	GRETA: Life Cycle Sustainability Assessment Tool	WP4	42 - SUPS	R — Document, report	PU - Public	22
D4.3	H4C ECoP IT advancement plant to grow the H4C CoP user base	WP4	6 - INM	R — Document, report	PU - Public	22
D4.4	Regenerate Hub: waste mapping and site surveys Tool	WP4	7 - RECY	R — Document, report	PU - Public	22

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Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D4.5	Clusterly: Ecosystem builder for IUS networks	WP4	3 - ECOW	R — Document, report	PU - Public	24
D4.6	IUS process designer for network scenarios	WP4	4 - EKOD	R — Document, report	PU - Public	24
D4.7	DPP, Material Passport and IUS materials exchange Tools	WP4	3 - ECOW	R — Document, report	PU - Public	24
D4.8	AI recommender for IUS network development	WP4	11 - UoJ	R — Document, report	PU - Public	24
D5.1	H4C membership & business models progress	WP5	6 - INM	R — Document, report	SEN - Sensitive	30
D5.2	IUS network scenarios wastes mapping and options screening	WP5	1 - CART	R — Document, report	PU - Public	28
D5.3	Policy recommendations to incentivise and optimise IUS	WP5	24 - SCYC	R — Document, report	PU - Public	35
D5.4	IUS network designs & best practices	WP5	1 - CART	R — Document, report	PU - Public	36
D5.5	H4C Social Innovation case studies	WP5	21 - ECOL	R — Document, report	PU - Public	38
D5.6	IUS network Life Cycle Sustainability Analyses	WP5	42 - SUPS	R — Document, report	PU - Public	44
D5.7	IUS infrastructure financing briefing & progress	WP5	23 - G2H	R — Document, report	PU - Public	42

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Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D5.8	Replication agreements, pre-tech designs & financial prospectus	WP5	6 - INM	R — Document, report	SEN - Sensitive	44
D6.1	Demonstrator activities, monitoring & evaluation framework	WP6	5 - AQUA	R — Document, report	SEN - Sensitive	30
D6.2	Zero Urban C&DW demonstrations report	WP6	5 - AQUA	R — Document, report	SEN - Sensitive	44
D6.3	WWTP recovery and circular water demonstrations report	WP6	2 - BAST	R — Document, report	SEN - Sensitive	44
D6.4	UCO & Bioplastics demonstrations report	WP6	15 - NOVA	R — Document, report	SEN - Sensitive	44
D6.5	Demonstrator replication insights for scaling to TRL8	WP6	1 - CART	R — Document, report	PU - Public	45
D6.6	UC IUS Exemplary solutions for best practices sharing	WP6	20 - ZEDO	R — Document, report	PU - Public	48
D7.1	Communication and Dissemination Plan incl. brand book	WP7	14 - COM	R — Document, report	PU - Public	6
D7.2	United Circles materials for Communication & dissemination	WP7	14 - COM	R — Document, report	PU - Public	6
D7.3	United Circles 2nd period C&D materials	WP7	14 - COM	R — Document, report	PU - Public	18
D7.4	United Circles 3rd period C&D materials	WP7	14 - COM	R — Document, report	PU - Public	36

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Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D7.5	Communication & Dissemination Project events learnings	WP7	14 - COM	R — Document, report	PU - Public	44
D7.6	Communication & Dissemination performance report	WP7	14 - COM	R — Document, report	PU - Public	48
D7.7	Standardisation landscape scan for IUS	WP7	12 - UNI	R — Document, report	PU - Public	16
D7.8	Exploitable results and business strategies	WP7	23 - G2H	R — Document, report	SEN - Sensitive	20
D7.9	UC Business models, IPR and financing	WP7	23 - G2H	R — Document, report	SEN - Sensitive	28
D7.10	UC Funding strategies and their implementation	WP7	23 - G2H	R — Document, report	SEN - Sensitive	38
D7.11	Global media campaign results report	WP7	24 - SCYC	R — Document, report	SEN - Sensitive	48

Deliverable D1.1 – Kick-off meeting result report

Deliverable Number	D1.1	Lead Beneficiary	1 - CART
Deliverable Name	Kick-off meeting result report		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	2	Work Package No	WP1

Description
Report of the Kick-off meeting results including all financial and technical agreements. Legal part. “Deliverable D1.1 completely reflects the work of the tasks T1.1”.

Deliverable D1.2 – Risk and contingency plan

Deliverable Number	D1.2	Lead Beneficiary	1 - CART
Deliverable Name	Risk and contingency plan		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	3	Work Package No	WP1

Description
Evaluation of all the possible risks that could appear during the development of the project, for all the partners and use cases, and the contingency plan of each possible risk. “Deliverable D1.2 completely reflects the work of the tasks T1.4”.

Deliverable D1.3 – Gender and Equality plan

Deliverable Number	D1.3	Lead Beneficiary	1 - CART
Deliverable Name	Gender and Equality plan		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	5	Work Package No	WP1

Description
Presents the different policy and organizational structure of committees in terms of gender equality, gender participation in the project consortium and teams. “Deliverable D1.3 completely reflects the work of the tasks T1.1 & T1.4”.

Deliverable D1.4 – Research and Data Management Plan

Deliverable Number	D1.4	Lead Beneficiary	3 - ECOW
Deliverable Name	Research and Data Management Plan		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	6	Work Package No	WP1

Description

The plan will include the expected datasets that will be generated in United Circles, and how they will be managed under FAIR and GDPR principles. It will also include an overview of the research methodologies to be deployed and the process of evaluating reproducibility, deciding on the research design, quality assurance. The report will cover also how ethical aspects are considered and managed within United Circles. Open science and publication practices will also be detailed. “Deliverable D1.4 completely reflects the work of the tasks T1.1”.

Deliverable D2.1 – Community of Practice building progress

Deliverable Number	D2.1	**Lead Beneficiary**	20 - ZEDO
Deliverable Name	Community of Practice building progress		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	5	**Work Package No**	WP2

Description
An overview will be provided of the existing H4C Community of practice and its offering, sister Processes4Planet projects, and the concept of the Community of Practice for the United Circles project. An overview of the United Circles demonstrators will be presented, and of the 7 Hubs4Circularity with their initial network and regional stakeholders to reach out to for building the H4C. Finally, the Clusterly ecosystem launch for United Circles will be reported on “Deliverable D2.1 completely reflects the work of the tasks T2.1”.

Deliverable D2.2 – H4C Charter

Deliverable Number	D2.2	**Lead Beneficiary**	3 - ECOW
Deliverable Name	H4C Charter		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	8	**Work Package No**	WP2

Description
The Charter is a guidance document for hubs 4 circularity. It includes a vision for the hubs, what the objective is of a hub, the activities to realise these objectives, and described different hub models and associated governance structures. It includes the evolution of a hub over time given capabilities & capacities in line with the Processes4Planet partnership concepts. “Deliverable D2.2 completely reflects the work of the tasks T2.2”.

Deliverable D2.3 – Feasibility to Finance framework for Circular Infrastructure

Deliverable Number	D2.3	**Lead Beneficiary**	3 - ECOW
Deliverable Name	Feasibility to Finance framework for Circular Infrastructure		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	12	**Work Package No**	WP2

Description
The report will outline the developed feasibility studies to financing framework, as a step by step concrete methodology to develop a regional or territorial plan to transform a particular waste into a zero waste situation through technical and social innovations, where it is fully utilised through industrial-urban symbiosis links. It will include the overall methodological framework with the objectives, and the details for each step in separate chapters, for innovating industrial-urban symbiosis networks. “Deliverable D2.3 completely reflects the work of the tasks T2.3”.

Deliverable D2.4 – Social Impact Assessment Analysis framework

Deliverable Number	D2.4	**Lead Beneficiary**	21 - ECOL
Deliverable Name	Social Impact Assessment Analysis framework		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	12	**Work Package No**	WP2

Description
Two new frameworks are presented in the deliverable. The approaches and activities hubs 4 circularity can employ to involve citizens and community actors as active stakeholders are defined in a templates and process type format. And a framework is provided for social impact KPIs and how they can be operationalised and measured in terms of employment, equitability and equality impacts of the Hub in achieving a healthier environment from a citizen perspective in the hubs region. The report will also assess how social-LCA methods can be utilised to measure some of these KPIs. Finally, reporting will be done of a community stakeholder mapping each of the 7 H4C regions and how they will be involved in the H4C in relation to the approaches and activities framework. “Deliverable D2.4 completely reflects the work of the tasks T2.4”.

Deliverable D2.5 – H4C Evolution progress

Deliverable Number	D2.5	**Lead Beneficiary**	1 - CART
Deliverable Name	H4C Evolution progress		
Type	R — Document, report	**Dissemination Level**	SEN - Sensitive
Due Date (month)	15	**Work Package No**	WP2

Description
The deliverable will present two sets of results. First, it will capture the progress made for the 3 demonstrator H4C and 4 mirroring H4C. Progress reporting will include for each H4C activities carried out to formalise the hub structure, its governance structure and advisory board. It will also cover the regionally contextualised focus of the Hub in terms of wastes of concern to transform through industrial-urban symbiosis efforts. And outline the detailed stakeholder network mapping, how communication channels with stakeholders have been setup, and activities involving stakeholders and results thereof. The second set of results covers the effort for each of the seed hubs with their mission & vision plan, the regional stakeholders that were involved in formulating the plan and support it, and a working group established to take the next steps in attracting financing and making a roadmap, and a list of efforts made to attract financing to enable the seed hub to becoming a starting hub. “Deliverable D2.5 completely reflects the work of the tasks T2.5”.

Deliverable D2.6 – Integrated Waste mapping and collection methodology

Deliverable Number	D2.6	**Lead Beneficiary**	24 - SCYC
Deliverable Name	Integrated Waste mapping and collection methodology		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	20	**Work Package No**	WP2

Description
The report will provide for a refined qualitative and quantitative waste and material flow mapping protocol for a region as a systematic approach, with associated methods and costings. It can be used for a particular waste or multiple wastes. The approach covers multiple analytical layers and how they can be integrated, including top-down material flow & waste estimation, bottom-up site surveys & sampling, lab-testing of samples to obtain specifications for physical

transformation, and sensor monitoring methods. The report will also provides for a template regional waste mapping report that defines how results are analysed and put into the H4C context. "Deliverable D2.6 completely reflects the work of the tasks T2.6".

Deliverable D2.7 – H4C Skills Training programme design

Deliverable Number	D2.7	**Lead Beneficiary**	8 - STEN
Deliverable Name	H4C Skills Training programme design		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	20	**Work Package No**	WP2

Description
The report will provide for the results of a training programme for Hubs 4 Circularity staff members and involved stakeholders in a H4C. It will contain a skills & training needs evaluation for each H4C providing a skills requirements & needs matrix. It will also report on anonymised interview from existing IUS H4C and eco-industrial park managers on challenges and skills & training needs. And the contents and results of the training programme developed based on the needs for the consortium members and H4C members & stakeholders. "Deliverable D2.7 completely reflects the work of the tasks T2.7".

Deliverable D2.8 – Online H4C Guidebook progress

Deliverable Number	D2.8	**Lead Beneficiary**	14 - COM
Deliverable Name	Online H4C Guidebook progress		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	20	**Work Package No**	WP2

Description
The report will capture the online guidebook contents created on the United Circles website, that covers all frameworks created under WP2 and how they support the setup and management of H4C. It will also report on the launch event of the online guidebook in terms of attendance and presentations to make this available to the wider H4C ECoP. "Deliverable D2.8 completely reflects the work of the tasks T2.1 & T2.8".

Deliverable D3.1 – Demonstrator innovation design and planning

Deliverable Number	D3.1	**Lead Beneficiary**	1 - CART
Deliverable Name	Demonstrator innovation design and planning		
Type	R — Document, report	**Dissemination Level**	SEN - Sensitive
Due Date (month)	8	**Work Package No**	WP3

Description
The report will describe the baseline material flow situation of the demonstrators, and how the innovations for each of the demonstrators are expected to transform these flows, their carbon emissions, sustainability impacts and economic impacts, with associated KPIs, building upon the impacts calculations in the grant agreement. The gaps from the current technology that require innovation will be described in relation to the KPIs to be achieved, and the activity plan with timings for the innovations in the WP3 and associated innovation implementation in WP6. An organogram will be

created for each demonstrator and associated partners. Finally a monitoring & evaluation framework will be described with activity driven KPIs. "Deliverable D3.1 completely reflects the work of the tasks T3.1".

Deliverable D3.2 – Zero Urban C&DW innovations progress

Deliverable Number	D3.2	**Lead Beneficiary**	2 - BAST
Deliverable Name	Zero Urban C&DW innovations progress		
Type	R — Document, report	**Dissemination Level**	SEN - Sensitive
Due Date (month)	30	**Work Package No**	WP3

Description
The report will report on the innovations carried out to advance 5 technologies for the zero urban C&DW demonstrator from lab scale to upscaled pre-demonstration deployment for TRL7 realisation. This includes design and engineering works, protocol development, test-bench and lab-setup testing iteration efforts, small reactors or process unit deployments, and procurement and leasing efforts, and site preparation efforts for TRL7 deployment in WP5. The report will also report on the C&DW waste characterisation and a collection protocol for PIR foam, and efforts carried out to acquire the materials and sampling lab results. The report will also cover the designed 2-storey building to be built and the procurement effort for the 3D printer and service for the building. "Deliverable D3.2 completely reflects the work of the tasks T3.2".

Deliverable D3.3 – WWTP recovery and circular water innovations progress

Deliverable Number	D3.3	**Lead Beneficiary**	5 - AQUA
Deliverable Name	WWTP recovery and circular water innovations progress		
Type	R — Document, report	**Dissemination Level**	SEN - Sensitive
Due Date (month)	30	**Work Package No**	WP3

Description
The report will report on the innovations carried out to advance 6 technologies for the WWTP recovery and circular water demonstrator from lab scale to upscaled pre-demonstration deployment for TRL7 realisation. This includes design and engineering works, protocol development, test-bench and lab-setup testing iteration efforts, small reactors or process unit deployments, and procurement and leasing efforts, and site preparation efforts for TRL7 deployment in WP5. The report will also cover detailed data collection efforts for different waste streams covering wastewater, industrial water, waste quality and quantity based on baseline available data and where needed supplementary laboratory tests. "Deliverable D3.3 completely reflects the work of the tasks T3.3".

Deliverable D3.4 – UCO & Bioplastics innovations progress

Deliverable Number	D3.4	**Lead Beneficiary**	15 - NOVA
Deliverable Name	UCO & Bioplastics innovations progress		
Type	R — Document, report	**Dissemination Level**	SEN - Sensitive
Due Date (month)	30	**Work Package No**	WP3

Description
The report will report on the innovations carried out to advance 4 technologies for the UCO & bioplastics demonstrator from lab scale to upscaled pre-demonstration deployment for TRL7 realisation. This includes design and

engineering works, protocol development, test-bench and lab-setup testing iteration efforts, small reactors or process unit deployments, and procurement and leasing efforts, and site preparation efforts for TRL7 deployment in WP5. The report will also cover the collection scheme design for used cooking oil covering a smart deposit return scheme trial linked to Digital Product Passports. "Deliverable D3.4 completely reflects the work of the tasks T3.4".

Deliverable D3.5 – Cross-demonstrator symbiosis innovations progress

Deliverable Number	D3.5	**Lead Beneficiary**	1 - CART
Deliverable Name	Cross-demonstrator symbiosis innovations progress		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	28	**Work Package No**	WP3

Description
The report provides the results of six laboratory level innovation advancements that allow for materials to be valorised between the three United Circles demonstrators. The innovation results will cover: 1) WWTP recovered cellulose conversion into sugars for bio-refinery utilisation; 2) wood conversion for bio-refining; 3) hydrochar production from sludge for WWTP adsorbent; 4) activated carbon production from C&DW wood; 5) lignin extraction for phenolic resins and 6) hydrochar production from HTL process of WWTP waste streams. Results will include material specifications, process descriptions, process conversion results and TRL status advancements, as well as the feasibility and challenges for future up-scaling to higher TRL levels. "Deliverable D3.5 completely reflects the work of the tasks T3.5".

Deliverable D3.6 – Demonstrator innovation data synthesis for replication

Deliverable Number	D3.6	**Lead Beneficiary**	1 - CART
Deliverable Name	Demonstrator innovation data synthesis for replication		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	30	**Work Package No**	WP3

Description
The report will cover a summary and synthesis of all the innovations carried out in WP3 across the demonstrators and cross-demonstrator innovation links for replication purposes. It will cover overall progress KPIs, technology replication conditions, technology IP utilisation conditions/models, uncertainties, technology deployment challenges, and regional waste flow requirements. The report will also cover a summary of workshops between demonstrator H4C partners and mirroring H4C partners about replication potentials. "Deliverable D3.6 completely reflects the work of the tasks T3.6".

Deliverable D3.7 – Intermediary innovations monitoring & verification

Deliverable Number	D3.7	**Lead Beneficiary**	1 - CART
Deliverable Name	Intermediary innovations monitoring & verification		
Type	R — Document, report	**Dissemination Level**	SEN - Sensitive
Due Date (month)	18	**Work Package No**	WP3

Description
Provides for an update on the innovations being carried out in WP3. "Deliverable D3.7 completely reflects the work of the tasks T3.3 & T3.4"

Deliverable D4.1 – Data interoperability for IUS Digital Tools

Deliverable Number	D4.1	**Lead Beneficiary**	11 - UoJ
Deliverable Name	Data interoperability for IUS Digital Tools		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	10	**Work Package No**	WP4

Description
The deliverable describes the framework for interoperability between industrial-urban symbiosis tools, so that they can be interlinked from an input-output perspective. It will include a description of United Circles tools and data input and data/results output formats, screened external tools of relevance including those listed in the EU H4C community that are in active use. Open taxonomies and ontologies in existence for materials and processes will be described, and how they relate to tools. A new taxonomy and data format will form the basis of the framework that will be laid down. Finally, use case scenarios for linking the tools will be formulated to outline their integration potential and benefits. "Deliverable D4.1 completely reflects the work of the tasks T4.1".

Deliverable D4.2 – GRETA: Life Cycle Sustainability Assessment Tool

Deliverable Number	D4.2	**Lead Beneficiary**	42 - SUPS
Deliverable Name	GRETA: Life Cycle Sustainability Assessment Tool		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	22	**Work Package No**	WP4

Description
The report will describe the analysis to assess the suitability of LCSA methodologies for evaluation IUS networks and their material flows and options for functional unit selection. It will report on a standardised approach proposed for LCSA assessments to calculate indicators for IUS networks and make them comparable, and a schema for capturing unit process parameters at different TRL levels, so as to enable TRL dependent LCSA calculations. The report will also report on how these frameworks have been implemented in the GRETA tool for LCSA calculations in United Circles. "Deliverable D4.2 completely reflects the work of the tasks T4.2".

Deliverable D4.3 – H4C ECoP IT advancement plant to grow the H4C CoP user base

Deliverable Number	D4.3	**Lead Beneficiary**	6 - INM
Deliverable Name	H4C ECoP IT advancement plant to grow the H4C CoP user base		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	22	**Work Package No**	WP4

Description
The report will lay down an improvement plan for the existing H4C IUS ECoP platform, based on the existing features and additional needs for strengthening the ECoP. Specific considerations are described for connecting to other information management platforms and initiatives focusing on regional innovation networks and circularity networks. It will also report on efforts to evolve specific features with the ECoP. "Deliverable D4.3 completely reflects the work of the tasks T4.3".

Deliverable D4.4 – Regenerate Hub: waste mapping and site surveys Tool

Deliverable Number	D4.4	**Lead Beneficiary**	7 - RECY
Deliverable Name	Regenerate Hub: waste mapping and site surveys Tool		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	22	**Work Package No**	WP4

Description
The report will capture results in advancement of the regenerate explorer tool for waste mapping and circularity solution visualisation. It will describe the existing tool definition at the start of the task, scoping exercises carried out to evaluate improvement needs in a H4C context, and the efforts and results of improving the tool for waste and site survey mapping and visualisation, as well as the process for regenerative circular loop identification. "Deliverable D4.4 completely reflects the work of the tasks T4.4".

Deliverable D4.5 – Clusterly: Ecosystem builder for IUS networks

Deliverable Number	D4.5	**Lead Beneficiary**	3 - ECOW
Deliverable Name	Clusterly: Ecosystem builder for IUS networks		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	24	**Work Package No**	WP4

Description
The report will provide an overview of the features planned and developed for the H4C Clusterly Ecosystem, including the innovation showcasing area, the H4C networks cluster areas, links to the ECoP website, and the communication groups area advancements. "Deliverable D4.5 completely reflects the work of the tasks T4.5".

Deliverable D4.6 – IUS process designer for network scenarios

Deliverable Number	D4.6	**Lead Beneficiary**	4 - EKOD
Deliverable Name	IUS process designer for network scenarios		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	24	**Work Package No**	WP4

Description
The deliverable will describe the results in advancing the IUS network design tool, to calculates changes in material waste flows in a region. The report will provide for the framework to establish the existing flows from a process selector library, new modules to create new process libraries for particular waste(s) and to introduce new process adjustments in a IUS network. It will also report on testing of the tool to represent the 3 demonstrator IUS networks and expected improvements from the technology innovations. "Deliverable D4.6 completely reflects the work of the tasks T4.6".

Deliverable D4.7 – DPP, Material Passport and IUS materials exchange Tools

Deliverable Number	D4.7	**Lead Beneficiary**	3 - ECOW

Deliverable Name	DPP, Material Passport and IUS materials exchange Tools		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	24	Work Package No	WP4

Description
The report will deliver the concept of the material observatory for an IUS H4C network. It will cover how different tools from WP4 can be utilised in an integrated manner to track wastes, materials and products in a region and measure the circularity of these flows. It will also report on the advancement results of two tools that form a key part of this observatory. The document management catalogue that will be further innovated into an IUS process and material info exchange catalogue. And a digital product passport tool that will be advanced into a material passport tool for tracking and specifying wastes and upcycled resources and their batch shipments as well as products. "Deliverable D4.7 completely reflects the work of the tasks T4.7".

Deliverable D4.8 – AI recommender for IUS network development

Deliverable Number	D4.8	Lead Beneficiary	11 - UoJ
Deliverable Name	AI recommender for IUS network development		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	24	Work Package No	WP4

Description
The report will describe the results of innovating an AI machine learning tool for finding insights and recommendations in building IUS networks for H4C managers. Reporting will cover the workshops to outline use case needs for information discovery, the architecture of the tool, deployed AI safety protocols, and the resulting final tool at end of the tasks with their dashboards and test scenarios. "Deliverable D4.8 completely reflects the work of the tasks T4.8".

Deliverable D5.1 – H4C membership & business models progress

Deliverable Number	D5.1	Lead Beneficiary	6 - INM
Deliverable Name	H4C membership & business models progress		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	30	Work Package No	WP5

Description
The report will provide for an update for each H4C in United Circles on their stakeholder network development, events organised with local stakeholders, thematic working groups for particular wastes and outreach to community actors and financial institutions for fundraising & financial advisory. "Deliverable D5.1completely reflects the work of the tasks T5.1".

Deliverable D5.2 – IUS network scenarios wastes mapping and options screening

Deliverable Number	D5.2	Lead Beneficiary	1 - CART
Deliverable Name	IUS network scenarios wastes mapping and options screening		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	28	Work Package No	WP5

Description
The report will cover the efforts of a waste mapping and screening effort for the 3 demonstrator H4C and 4 mirroring H4C for chosen wastes. Each H4C will provide for a summary of its regional waste report, and screened options to collect, sort, upcycle and reuse & recycle those wastes where relevant. The reported results included United Circles and additional technology innovation options that can form an integrated IUS network when upscaled in the region. “Deliverable D5.2 completely reflects the work of the tasks T5.2”.

Deliverable D5.3 – Policy recommendations to incentivise and optimise IUS

Deliverable Number	D5.3	**Lead Beneficiary**	24 - SCYC
Deliverable Name	Policy recommendations to incentivise and optimise IUS		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	35	**Work Package No**	WP5

Description
The report will capture an overview of policies in place and in progress at national, regional, EU and global level that set rules for resource-use and waste prevention in industrial and zero-waste contexts. As well as a literature assessment and stakeholder insights evaluation on policy hindrance or support needs to boost IUS to shift to zero waste, focusing on streamlining, amending and improving existing frameworks and policies, and minimum standards across regional communities. “Deliverable D5.3 completely reflects the work of the tasks T5.3”.

Deliverable D5.4 – IUS network designs & best practices

Deliverable Number	D5.4	**Lead Beneficiary**	1 - CART
Deliverable Name	IUS network designs & best practices		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	36	**Work Package No**	WP5

Description
The report will cover the results of the IUS network design created at the end of T5.4 for the 3 demonstrator H4C and 4 mirroring H4C. These cover baseline current situation and scenarios with scaled technology innovations to tackle each waste flow, covering both United Circles innovations and additional prospective innovations. The report will also cover a chapter on conversations with existing technology vendors outside of the project to summarise the potential of the external innovations and associated parameters. “Deliverable D5.4 completely reflects the work of the tasks T5.4”.

Deliverable D5.5 – H4C Social Innovation case studies

Deliverable Number	D5.5	**Lead Beneficiary**	21 - ECOL
Deliverable Name	H4C Social Innovation case studies		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	38	**Work Package No**	WP5

Description
The report will describe all the social innovations deployed during the united circles project and the lessons learnt for future activity managers. These cover the primary school inspirational workshops, regional community actor workshops

with roundtable ideation and design ideas, and citizen engagement efforts using product Digital Product Passports. “Deliverable D5.5 completely reflects the work of the tasks T5.5”.

Deliverable D5.6 – IUS network Life Cycle Sustainability Analyses

Deliverable Number	D5.6	**Lead Beneficiary**	42 - SUPS
Deliverable Name	IUS network Life Cycle Sustainability Analyses		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	44	**Work Package No**	WP5

Description
The report will provide for the results of the Life Cycle Sustainability Analyses for the 3 demonstrator IUS networks covering environmental, social and economic analyses using the GRETA tool, based on realised innovations, given the final decisions on boundaries, functional units and scenarios. “Deliverable D5.6 completely reflects the work of the tasks T5.6”.

Deliverable D5.7 – IUS infrastructure financing briefing & progress

Deliverable Number	D5.7	**Lead Beneficiary**	23 - G2H
Deliverable Name	IUS infrastructure financing briefing & progress		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	42	**Work Package No**	WP5

Description
The report will summarise two separate efforts. First, an assessment of financial actors based on a criteria framework who would be likely to expand their portfolio of investment activities to cover IUS network innovations and zero waste plant investments. Paired with the delivery of a financial briefing paper on the prospects for investors to invest in selected innovations under Processes4Planet, and an outreach and investor dialogue effort to broaden the investment scope to such technologies. Second, the results of a broader investment outreach effort and finance focused events for the H4C to scale as institutions to foster infrastructure driven technology innovations for each of the 7 H4C regions, followed from T5.8 efforts to the point of Expression of Interest and due diligence documentation preparation. “Deliverable D5.7 completely reflects the work of the tasks T5.7”.

Deliverable D5.8 – Replication agreements, pre-tech designs & financial prospectus

Deliverable Number	D5.8	**Lead Beneficiary**	6 - INM
Deliverable Name	Replication agreements, pre-tech designs & financial prospectus		
Type	R — Document, report	**Dissemination Level**	SEN - Sensitive
Due Date (month)	44	**Work Package No**	WP5

Description
The report will summarise the agreements made between United Circles H4C and the technology vendors in the project for advancing further scaling at the end of the project towards TRL8 deployments. It will also cover updated overviews of the technical design and economic analyses for the pre-investment decision making with financial conditions and investment asks. The information will be synthesised in a financial prospectus for each hub to enable capital fundraising for a TRL8 replicator. “Deliverable D5.8 completely reflects the work of the tasks T5.8”.

Deliverable D6.1 – Demonstrator activities, monitoring & evaluation framework

Deliverable Number	D6.1	**Lead Beneficiary**	5 - AQUA
Deliverable Name	Demonstrator activities, monitoring & evaluation framework		
Type	R — Document, report	**Dissemination Level**	SEN - Sensitive
Due Date (month)	30	**Work Package No**	WP6

Description
The report will provide for an updated planning, monitoring & evaluation framework with KPIs for the demonstrators, as well as procurement status, responsibilities and communication efforts, based on the baseline from WP3. “Deliverable D6.1 completely reflects the work of the tasks T6.1”.

Deliverable D6.2 – Zero Urban C&DW demonstrations report

Deliverable Number	D6.2	**Lead Beneficiary**	5 - AQUA
Deliverable Name	Zero Urban C&DW demonstrations report		
Type	R — Document, report	**Dissemination Level**	SEN - Sensitive
Due Date (month)	44	**Work Package No**	WP6

Description
The report will describe the final results of the zero urban C&DW demonstrator in sorting and upcycling components of C&DW based on the 5 deployed technology innovations. Descriptions will include the final site demonstration setups at TRL7, challenges encountered and solved, remaining technical and economic gaps for further scaling, and prospective solution routes recommended to be further innovated towards TRL8 deployments. “Deliverable D6.2 completely reflects the work of the tasks T6.2”.

Deliverable D6.3 – WWTP recovery and circular water demonstrations report

Deliverable Number	D6.3	**Lead Beneficiary**	2 - BAST
Deliverable Name	WWTP recovery and circular water demonstrations report		
Type	R — Document, report	**Dissemination Level**	SEN - Sensitive
Due Date (month)	44	**Work Package No**	WP6

Description
The report will describe the final results of the WWTP recovery and circular water demonstrator in sorting and upcycling waste-water components based on the 4 deployed technology innovations. Descriptions will include the final site demonstration setups at TRL7, challenges encountered and solved, remaining technical and economic gaps for further scaling, and prospective solution routes recommended to be further innovated towards TRL8 deployments. “Deliverable D6.3 completely reflects the work of the tasks T6.3”.

Deliverable D6.4 – UCO & Bioplastics demonstrations report

Deliverable Number	D6.4	**Lead Beneficiary**	15 - NOVA
Deliverable Name	UCO & Bioplastics demonstrations report		

Type	R — Document, report	**Dissemination Level**	SEN - Sensitive
Due Date (month)	44	**Work Package No**	WP6

Description
The report will describe the final results of the UCO & Bioplastics demonstrator in sorting and upcycling components of cooking oil and fermentation reactors based on the 4 deployed technology innovations. Descriptions will include the final site demonstration setups at TRL7, challenges encountered and solved, remaining technical and economic gaps for further scaling, and prospective solution routes recommended to be further innovated towards TRL8 deployments. “Deliverable D6.4 completely reflects the work of the tasks T6.4”.

Deliverable D6.5 – Demonstrator replication insights for scaling to TRL8

Deliverable Number	D6.5	**Lead Beneficiary**	1 - CART
Deliverable Name	Demonstrator replication insights for scaling to TRL8		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	45	**Work Package No**	WP6

Description
The report will capture the final results for internal consumption by consortium partners of the demonstrator technology implementations in the H4C contexts. It will provide for the final assessment based on the Monitoring & Verification plan from T6.1 and broader insights at technical, economic, environmental and social levels. The results will be synthesised for purposes of inputs to mirroring H4C to enable them to refine the financial case for scaled investment. “Deliverable D6.5 completely reflects the work of the tasks T6.5”.

Deliverable D6.6 – UC IUS Exemplary solutions for best practices sharing

Deliverable Number	D6.6	**Lead Beneficiary**	20 - ZEDO
Deliverable Name	UC IUS Exemplary solutions for best practices sharing		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	48	**Work Package No**	WP6

Description
The report will provide for a public communicable solution brief for each of the 3 demonstrators, based on the internal results captured in T6.5 for the demonstrators. The report will summarise the three visualised information sheets made covering environmental, social and economic KPIs and impacts delivered, for further awareness, interest raising and uptake of the demonstrator IUS approaches. “Deliverable D6.6completely reflects the work of the tasks T6.6”.

Deliverable D7.1 – Communication and Dissemination Plan incl. brand book

Deliverable Number	D7.1	**Lead Beneficiary**	14 - COM
Deliverable Name	Communication and Dissemination Plan incl. brand book		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	6	**Work Package No**	WP7

Description

The deliverable will summarise the channels, tools and approaches to communicating and disseminating the project in WP7 in a staged manner, in relation to the results provided and their timeline. It will also revisited the project's main messages and set the project brand with logo, colour schema, material types, so as to provide for a uniform impactful way to reach out. The targets to reach from the grant agreement will be refined in how they can be realised, based on bottom-up inputs from the consortium. "Deliverable D7.1 completely reflects the work of the tasks T7.1".

Deliverable D7.2 – United Circles materials for Communication & dissemination

Deliverable Number	D7.2	**Lead Beneficiary**	14 - COM
Deliverable Name	United Circles materials for Communication & dissemination		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	6	**Work Package No**	WP7

Description
The deliverable will report on the communication channels and physical and digital materials created used to spread the messages of the project, including brochures, the website, social media, leaflets and posters. To help all partners understand the materials available to them. "Deliverable D7.2 completely reflects the work of the tasks T7.1".

Deliverable D7.3 – United Circles 2nd period C&D materials

Deliverable Number	D7.3	**Lead Beneficiary**	14 - COM
Deliverable Name	United Circles 2nd period C&D materials		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	18	**Work Package No**	WP7

Description
The deliverable will provide an update on the materials created for communication for the consortium and updates on digital communication channels based on progress in the 1st project period. "Deliverable D7.3 completely reflects the work of the tasks T7.1".

Deliverable D7.4 – United Circles 3rd period C&D materials

Deliverable Number	D7.4	**Lead Beneficiary**	14 - COM
Deliverable Name	United Circles 3rd period C&D materials		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	36	**Work Package No**	WP7

Description
The deliverable will provide an update on the materials created for communication for the consortium and updates on digital communication channels, based on progress in the 2nd project period. "Deliverable D7.4 completely reflects the work of the tasks T7.1".

Deliverable D7.5 – Communication & Dissemination Project events learnings

Deliverable Number	D7.5	Lead Beneficiary	14 - COM
Deliverable Name	Communication & Dissemination Project events learnings		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	44	Work Package No	WP7

Description
The report will summarise all the United Circles events caried out during the project, including the six one-day innovation dissemination, three high-level policy and sector workshops, and four knowledge exchange forms, and other emerging events organised during the project. “Deliverable D7.5 completely reflects the work of the tasks T7.2”.

Deliverable D7.6 – Communication & Dissemination performance report

Deliverable Number	D7.6	Lead Beneficiary	14 - COM
Deliverable Name	Communication & Dissemination performance report		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	48	Work Package No	WP7

Description
The report will summarise the final KPI results for communication and dissemination based on the communication & dissemination strategy and lessons learned from the efforts. “Deliverable D7.6 completely reflects the work of the tasks T7.3”.

Deliverable D7.7 – Standardisation landscape scan for IUS

Deliverable Number	D7.7	Lead Beneficiary	12 - UNI
Deliverable Name	Standardisation landscape scan for IUS		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	16	Work Package No	WP7

Description
The deliverable will report on two efforts. It will cover the standardisation scan carried out on IUS and H4C and upcycling topics, in terms of existing standards and those in progress. It will also describe the CWA proposal to CEN to formalise further the feasibility to finance methodology from T2.3, as an intermediary step to delivering the pre-standard during the remainder of the task 7.4. “Deliverable D7.4 completely reflects the work of the tasks T7.4”.

Deliverable D7.8 – Exploitable results and business strategies

Deliverable Number	D7.8	Lead Beneficiary	23 - G2H
Deliverable Name	Exploitable results and business strategies		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	20	Work Package No	WP7

Description
The report will describe all exploitable results of the project building upon the list from the grant agreement, the owners of these results in advancing them, the results to prioritise for exploitation based on commercialisation and/or impact potentials. It will also describe a business strategy development template and the result of the collection of initial business strategies for the exploitable results. “Deliverable D7.8 completely reflects the work of the tasks T7.5”.

Deliverable D7.9 – UC Business models, IPR and financing

Deliverable Number	D7.9	**Lead Beneficiary**	23 - G2H
Deliverable Name	UC Business models, IPR and financing		
Type	R — Document, report	**Dissemination Level**	SEN - Sensitive
Due Date (month)	28	**Work Package No**	WP7

Description
The report will provide for the results of detailed business models created for prioritised exploitable results under WP7, their IPR strategy, and a financing scenario to commercialise the exploitable results. “Deliverable D7.9 completely reflects the work of the tasks T7.6”.

Deliverable D7.10 – UC Funding strategies and their implementation

Deliverable Number	D7.10	**Lead Beneficiary**	23 - G2H
Deliverable Name	UC Funding strategies and their implementation		
Type	R — Document, report	**Dissemination Level**	SEN - Sensitive
Due Date (month)	38	**Work Package No**	WP7

Description
The report will provide for the funding strategies for operational innovation focused infrastructure to move to a TRL8 technology innovation, focusing on the demonstrator technologies, based on the funding model and funding sources, and funding materials created. “Deliverable D7.10 completely reflects the work of the tasks T7.7”.

Deliverable D7.11 – Global media campaign results report

Deliverable Number	D7.11	**Lead Beneficiary**	24 - SCYC
Deliverable Name	Global media campaign results report		
Type	R — Document, report	**Dissemination Level**	SEN - Sensitive
Due Date (month)	48	**Work Package No**	WP7

Description
The report will describe the results of a global media campaign carried out to promote the results of the United Circles project, especially in the context of the recommendations for policy updates for standards across communities. It will cover the communication briefing created, the list of for a made for outreach and efforts implemented, and media presentations made. “Deliverable D7.11 completely reflects the work of the tasks T7.8”.

LIST OF MILESTONES

Milestones

Grant Preparation (Milestones screen) — Enter the info.

Milestone No	Milestone Name	Work Package No	Lead Beneficiary	Means of Verification	Due Date (month)
1	H4C Framework Foundations	WP2, WP7	3 - ECOW	IUS Community of Practice building activities and Clusterly ecosystem for H4C (T.2.1), Research and Data Plan, UC materials for communication & dissemination (T.7.1;T.7.2). Means of Verification: D.2.1, D.7.1, D.7.2	6
2	Financing and Social Impact Frameworks Initialised	WP2	3 - ECOW	H4C Infrastructure Feasibility framework (T.2.3), Social impact assessment and community engagement framework (T2.4) Initialised. Means of Verification: D.2.3, 2.4	12
3	Stakeholder Governance and First Version of Services	WP2, WP4	3 - ECOW	CH governance setup formalised defining process to setup new H4Cs established (T.2.5), IUS Waste mapping framework (T2.6) and CH Training Programme launched (T2.7), Over 150 stakeholders in the network, 1st version of T4.2 to T4.7 services launched. Means of Verification: D.2.5 to D2.7, D.4.2 to D.4.7	24
4	Technology design & innovation progress	WP3	1 - CART	Intermediate innovations monitoring & verification (D3.7) based on developments across T3.2,T3.3,T3.4 Means of Verification: D.3.7	18
5	IUS Use Cases and Results Monitoring	WP6, WP5	6 - INM	IUS network designs & best practices (T.5.4), H4C Social Innovation case studies (T.5.5) and Demonstrator start of results monitoring (T.6.1) Means of Verification: D.5.4, 5.5, T.6.1 M&E Framework used	38
6	IUS Integrated demonstrations complete	WP6, WP5, WP7	5 - AQUA	Demonstrators Deployed (T.6.2 to 6.4), M&E Framework Operated and results achieved	48

Milestones

Grant Preparation (Milestones screen) — Enter the info.

Milestone No	Milestone Name	Work Package No	Lead Beneficiary	Means of Verification	Due Date (month)
				(T6.1), Replication agreements for final F2F stages H4C expansion and replication (T.5.7), H4C Expansion and Replication plans, H4C Demonstrator Expansion plans and H4C follower replication plans (T7.7) complete for investment fundraising. Means of Verification: D.6.1 to 6.4, D.5.7, D.7.7	

LIST OF CRITICAL RISKS

Critical risks & risk management strategy

Grant Preparation (Critical Risks screen) — Enter the info.

Risk number	Description	Work Package No(s)	Proposed Mitigation Measures
1	Complex consortium results in insufficient comms and operation. Likelihood (L); Severity (M)	WP6, WP1, WP3, WP5, WP2, WP4, WP7	Effective coordination is ensured by the managerial structure & the Project Work plan. CART highly experienced in 40+ partner consortia; experienced WP leaders; demonstrators clustered and have competent lead partners.
2	Partner leaving or underperforming in large consortium over 4 years. Likelihood (H); Severity (L)	WP1	The consortium will proactively manage potential lack of performance and departure risks. In case of a departure, seek a substitution, first internally and then, if needed, externally, using the partners' very extensive, competent R&I cooperation networks built up since FP7 (and before for Coordinator CART).
3	Budget underestimated for the proper activity realization. Likelihood (L); Severity (M)	WP6, WP1, WP3, WP5, WP2, WP4, WP7	Budgets for each task and partner have been carefully calculated by both technical and financial personnel by each partner and reviewed by the Coordinator in two iterations with all partners. Cost estimations will be continuously forecasted and monitored, for demonstrators.

Critical risks & risk management strategy

Grant Preparation (Critical Risks screen) — Enter the info.

Risk number	Description	Work Package No(s)	Proposed Mitigation Measures
4	Delays of key deliverables causing delays in linked actions. Likelihood (M); Severity (M)	WP6, WP1, WP3, WP5, WP2, WP4, WP7	Milestones are in place to proactively control the higher risk technical portion of the project with critical interdependencies. In the event a deadline is forecasted to be delayed, a provisional draft will be prepared by WP leaders, allowing interdependent actions to be carried out.
5	F2F - methodology either too complex or in parts too superficial. Likelihood (M); Severity (M)	WP5, WP2	Learning from past project success stories and research grounded in CoP collaborative insights; Close collaboration with partners and building upon a range of existing financing methodologies.
6	Low interest of stakeholders & community actors in joining H4Cs. Likelihood (L); Severity (M)	WP5	Industrial partners are part of P4P sector associations with access to a large pool of industry stakeholders & in close contact with regional authorities. Partners with rich community actor engagement experience (ECOL); community actor inside project (TBB);regional association partners in consortium (LEGA;IMS).
7	Lack of trust of partners to share innovation datasets for replicators. Likelihood (L); Severity (M)	WP5	For innovation process data deliverables that are confidential, dedicated agreements will be made as common business practice, alternative methods to unlock sharing such as synthetic data adjustment with right metadata structure.
8	Secondary raw materials do not meet technical requirements. Likelihood (M); Severity (H)	WP6, WP3	New SWOT and laboratory analysis to identify causes and adapt market needs to improve secondary RM quality. UC will seek alternative supply solutions through commercial contacts as a solution for inter-process dependencies.
9	Recovered nutrients too low quality for NPK fertiliser. Likelihood (L); Severity (H)	WP6, WP3	Additional analytical studies will be carried out to assess why the quality is not achieved for process optimisation. Blending of recovered Mg salts by commercial Mg salts. Additional disinfection steps can be implemented.
10	Recovered cellulose too low quality for paper production. Likelihood (M); Severity (H)	WP6, WP3	Technical mitigation needed by seeking additional post-treatment steps through filtering or chemical treatment. Additional thermal hygienisation carried out as required based on existing Pulp & Paper plant equipment in place.
11	Biomethane syngas too low quality for gas grid utilisation. Likelihood (L); Severity (L)	WP6, WP3	Cleaning strategies for impurities removal (H2S) will be implemented. Additional studies for operational parameters optimization in anaerobic digestion to minimise impurities will be carried out.
12	Complexities and delays in adopting the digital	WP4	The data interoperability needs for the tools and the demonstrators will be analysed in detail,

Critical risks & risk management strategy

Grant Preparation (Critical Risks screen) — Enter the info.

Risk number	Description	Work Package No(s)	Proposed Mitigation Measures
	solutions of the project. Likelihood (L); Severity (M)		where the required exchanges, standards and capabilities of the stakeholders will be clearly identified. Continuous support will be provided to the related actors, providing sample data sets, ICT solutions and trainings.
13	Results differs from those at laboratory level for some technologies. Likelihood (M); Severity (M)	WP6	All scaling-up processes will follow a thorough methodology considering potential deviations and will implement measures to minimise this risk. A deep analysis of the deviations will allow understanding their root causes and analyse the admissibility of the pilot results to obtain the expected outcomes and impact.
14	Delays in construction & installation of demonstrator plants. Likelihood (M); Severity (H)	WP6	During construction, the partners will continuously assess and provide feedback to spot critical delays. Preventative measures will be taken to avoid hazards. A coordinated solution will be setup in case of major delays with a priority list for evaluation by EU officer & partners to adjust achievable timescales/objectives.
15	Innovations failure to advance to scaled TRL7 implementation. Likelihood (M); Severity (M)	WP6, WP3	Large enterprises and coordinator involved with experience in technology scaling; Careful selection of technologies during proposal; Innovation methods to be deployed with quality assurance design feedback
16	Treated wastewater quality insufficient for local policy regulations. Likelihood (L); Severity (H)	WP6	Additional post- or pre-treatments to fulfil specific requirements (reduction of contaminants such as heavy metals, B, As, drugs, hormones, pathogens). Post-treatments like ozonation, advanced oxidation processes or RO membranes.
17	Value Chain results not replicable outside UC H4C (too specific tech). Likelihood (L); Severity (H)	WP5	UC includes 4 different P4P sectors to maximise the impact. Replicability will be addressed with model-based viability analysis at pilot scale in the replicators and the seed hubs using the F2F methodology.
18	Lack of timely info from results to D&C. Likelihood (L); Severity (H)	WP7	Task for continuous diss. and comm. progress monitoring (T7.1); dedicated D&C manager assigned (COME) supported by Coordinator CART and ECOW.
19	CEN Workshop Agreement not accepted by CEN. Likelihood (L); Severity (L)	WP7	Standardisation partner with rich experience in developing and managing CWA in Horizon Europe projects (UNI) leading T7.5. Direct communication with CEN for adjustment of CEN Workshop agreement proposal and resubmission.
20	Data availability for sustainability assessment constrained. Likelihood (M); Severity (M)	WP5	Planning includes requirement for process data acquisition (T6.1); Negotiations with

Critical risks & risk management strategy

Grant Preparation (Critical Risks screen) — Enter the info.

Risk number	Description	Work Package No(s)	Proposed Mitigation Measures
			demonstrator partners on conditions under detailed process data can be made available (T5.4); if no primary data is available secondary data used.
21	Permits on sites for construction of demonstrators blocked. Likelihood (L); Severity (H)	WP6	Local conditions including permit requirements assessed early in first year based on site visits (T3.1); selected sites already have industrial activities of similar or same natures; legal permit experts involved within consortium.

PROJECT REVIEWS

Project Reviews

Grant Preparation (Reviews screen) — Enter the info.

Review No	Timing (month)	Location	Comments
RV1	18	Physical/Online tbc	
RV2	36	Physical/Online tbc	
RV3	48	Physical/Online tbc	