ASCEND

Accelerate poSitive
Clean ENergy Districts

Five PCED Books monitoring the advancement

Implementation status report – M12

Project: Accelerate poSitive Clean ENergy Districts
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WP: 4
Organisation: Energy Cities
Authors: Multiplier Cities, Eduardo Blanco, Sebastián Oviedo.
Date: January 25th, 2024
Status: Final
Version: 1
Dissemination level: Public

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Project Partners

Partners	Country	Abbreviation
SPL LYON CONFLUENCE	FR	SPL
METROPOLE DE LYON	FR	GLY
COMMUNE DE LYON	FR	LYS
HESPUL ASSOCIATION	FR	HES
URBAN PRACTICES	FR	UP
ENERTECH	FR	ETC
LANDESHAUPTSTADT MUNCHEN	DE	LHM
STADTWERKE MUENCHEN GMBH	DE	SWM
MUENCHNER GESELLSCHAFT FUER STADTERNEUERUNG MBH	DE	MGS
GWG Gemeinnützige Wohnstätten- und Siedlungsgesellschaft mbH	DE	GWG
UNICCORN GMBH	DE	UNC
TECHNISCHE UNIVERSITAET MUENCHEN	DE	TUM
ISARWATT EG	DE	IW
AVANCIS GMBH	DE	AVC
SPECTRUM MOBIL GMBH	DE	STA
UNTERNEHMERTUM GMBH	DE	UTUM
MUNICPALITY OF ALBA IULIA	RO	AIM
VILLE DE CHARLEROI	BE	CHA
IGRETEC	BE	IGC
AGÊNCIA DE ENERGIA DO PORTO	PT	PEN
EMPRESA DE AGUAS E ENERGIA DO MUNICIPIO DO PORTO EM	PT	AEP
FUNDACAO DE SERRALVES	PT	SRV
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Version History

Date	Person	Action	Status	Dissemination
22.01.24	S. Oviedo, E. Blanco	Comprehensive Version for Review	Final	Coordination
20.02.2024	B. Gaiddon	Reviewed Final v1	Sent for Revision	ENC
21.02.2024	S. Oviedo	Corrected typos	Final v2	Coordination Team

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Executive Summary

This report presents the five PCED Books developed by ASCEND's Multiplier Cities (MCs) – Alba Iulia, Budapest, Charleroi, Porto, and Prague. After this submission as a deliverable, these will become living documents to track the implementation of ASCEND's solutions at the Multipliers Cities. The books will be updated every six months to monitor the advancement of PCEDS in Multiplier Cities and to inform the ASCEND capacity-building program.

While some Solution Packages have higher readiness levels, such as SP1 and 3, others like SP2, 4, 5, and 6 face more challenges and are, at this stage, less mobilised by the Multipliers Cities.

The Multipliers cities also face challenges in having structured short-, medium-, and long-term planning and to draft roadmaps to implement their PCEDs. Nevertheless, these will inform the ASCEND capacity-building program, allowing the MCs to refine plans and elevate their current ambitions.

The five PCED Books are presented sequentially as individual documents for better readability.

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Introduction

This report presents the PCED Books from ASCEND's five Multiplier Cities (MCs): Alba Iulia, Budapest, Charleroi, Porto and Prague.

The PCED books are a planning and implementation monitoring tool. Despite starting at different maturity points, each MC will plan and implement solutions within ASCEND's Solution Packages, drawing from the learnings of Lyon and Munich, ASCEND Lighthouse Cities (LHCs).

The PCED Books will evolve as living documents. They will be internally updated every six months to track the solutions' implementation progress. This process will allow the identification of risks, changes, challenges, and lessons learned during the progress of MCs. The outputs from these monitoring books will also inform the ASCEND capacity-building program.

The PCED Books build upon the main solutions identified by each MC during the harvesting workshops held in early 2023. From then, Energy Cities supported each city to reorganise and prioritise their solutions per Solution Package, to plan their implementation process in more detail, and to report their current status at M12.

For better readability, the five PCED books are presented in sequence as individual documents, giving a comprehensive overview of each MCs status.

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Accelerate poSitive Clean ENergy Districts

Alba Iulia Municipality PCED Book

Implementation status report – M12

Project: Accelerate poSitive Clean ENergy Districts
Grant Agreement No.: 101096571
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Version History

Date	Person	Action	Status	Dissemination
13.10.2023	S. Oviedo, E. Blanco	Sent for feedback	Template (Draft)	MCs, Coordination
31.10.2023	S. Oviedo, E. Blanco	Submitted to Mcs	Template (Final)	MCs
12.12.2023	T. Drambarean	Sent Draft v1 for review	Draft v1	ENC
13.12.2023	S. Oviedo, E. Blanco, R. Simón de Lama	Reviewed Draft v1, returned for completion	Reviewed Draft v1	AIM
13.19.2023	T. Drambarean	Sent Draft v2 for review	Draft v2	ENC
01.05.2024	S. Oviedo, E. Blanco	Reviewed Draft v2, returned for completion	Reviewed Draft v2	AIM
01.09.2024	S. Oviedo	Compiled v1 + v2 including revisions, returned	Compiled Drafts v1 + v2	AIM
01.15.2024	T. Drambarean	Sent Draft v3 for review	Draft v3	ENC
01.17.2024	S. Oviedo	Reviewed Draft V3, returned for completion	Reviewed Draft v3	AIM
01.18.2024	T. Drambarean, L. Stanciu	Sent Draft v4	Draft v4	ENC
22.01.2024	S.Oviedo, E. Blanco	Edited Draft v3	Final v1	Coordination Team
20.02.2024	B. Gaiddon	Reviewed Final v1	Sent for Revision	ENC
21.02.2024	S. Oviedo	Corrected typos	Final v2	Coordination Team

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Alba Iulia Executive Summary: M12

Alba Iulia Municipality's PCED Book reveals the evolution of different solutions to be implemented during the ASCEND project lifetime. Organised around the project's Solution Packages (SPs), they comprise various efforts that will support the municipality towards reaching climate neutrality objectives. The report will be updated every 6 months as an internal report. Alba Iulia will implement solutions across four of ASCEND's Packages, on a PCED area of approximately 22.000 inhabitants and 200 hectares

On **SP1 - Digital Infrastructures and Tools for Flexible Energy Systems and PCED** the municipality will implement the solution "Creating a smart energy management infrastructure at Dorin Pavel High School". Unfavourable regulatory frameworks make the deployment of Energy Communities unfeasible for the moment. As regulations evolve, the project team will look to develop solutions within this package. On **SP3 - Energy-Efficiency Buildings Integrating RES, Storage and Frugal Solutions** the municipality will implement the solutions: "Building a self-consumption system for Dorin Pavel High School complex of building", "Create a new PEB campus withing PCED area, Upgrade public lighting to LED" and "Upgrade public lighting to LED", the latter part of a broader initiative. On **SP4 - Decarbonisation of Mobility and Freight Logistics,** the municipality will implement the solution "Building new lanes for bikes, e-bikes, cargo bikes" as part of a broader, city-wide project" On **SP5- Climate-Centric solutions and Co-creation along the Governance Chain** the municipality will implement the solutions "Engage local stakeholders – Intelligent Cities Challenge" and "Organize a Climathon"

Figure 1. Alba Iulia – PCED core area from above, with the Dorin Pavel Technical School in the foreground, with its 138kW PV installation. Photo by ALEA.

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Alba Iulia: Summary of Solutions

SP1	Digital Infrastructures and Tools for Flexible Energy Systems and PCED
ALB 1.1	Create a smart energy management infrastructure at Dorin Pavel High School

SP2	Deployment of Energy Communities and Prosumers
	No solutions are planned in SP2 at this point.

SP3	Energy-efficient Buildings Integrating RES, Storage and Frugal Solutions
ALB 3.1	Rehabilitation works for energy efficiency and creation of the infrastructure for a self-consumption system at Dorin Pavel High School complex of buildings
ALB 3.2	Create new PEB campus withing PCED area
ALB 3.3	Upgrade public lighting to LED

SP4	Decarbonisation of Mobility and Freight Logistics
ALB 4.1	Building new lanes for bikes, e-bikes, cargo bikes

SP5	Citizen-Centric Solutions and Co-creation along the Governance Chain
ALB 5.1	Engage local stakeholders – Intelligent Cities Challenge
ALB 5.2	Organize a Climathon

SP6	Urban Developer for PCED as an Umbrella Solution
	No solutions are planned in SP6 at this point.

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1. Alba Iulia Municipality SP1 Solutions

ALB 1.1 – Create a smart energy management infrastructure at Dorin Pavel High School

Solution Overview

Description	Creating a digital monitoring infrastructure at the "Dorin Pavel Technological High School" – , in the context of its energy efficiency renovation.
Involved actors and their role	- AIM: Responsible beneficiary - Ministry of Development, Public Works, and Administration - Investment Coordinator for the National Recovery and Resilience Plan - STIGMA BUILDING MANAGEMENT S.B.M S.R.L
Key Contact Person	Claudia Canta – Alba Iulia Municipality Investments Dep.
Expected Delivery Date	Dec. 2026

ALB 1.1 Solution Status M12

Status Overview

Planning progress:

50%										

Implementation progress:

10%										

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	Evaluation of PVs and physical infrastructure state
Which actions are currently underway?	Inspection and repairing/replacement of malfunctioning inverters connected to PVs (ca. ¼ of total)
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	- Insufficient funds - Suspension risk for some funds in the National Resilience plan - Costs rise due to inflation and prices - Incapacity to employ specialized people for the digital solutions to be implemented.

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Do these affect other solutions? If yes, which ones and how?	No.
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	No challenge was overcome until now.

Next Steps

Please briefly outline the overall next steps for this solution	- The preparation of the task book for the Bulding Management System (BMS) - Data consumption and production analysis - Preparation of the physical infrastructure to be monitored within the smart system - Energy management system integration – BMS deployment - Alternative systems for electrical and/or thermal energy generation integrated with the BMS - Equipping buildings with EV charging stations (using RES).
What actions are planned for the next semester?	The preparation of the task book for the BMS Data consumption and production analysis

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	It is too early for sharing lessons at this point, but maybe the most important thing to share is the importance of having a dedicated team from the municipality to supervise the solution and to collaborate with a dedicated private company for maintenance.
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	The National Recovery and Resilience Plan is a good opportunity to start different projects on multiple objectives dedicated to energy upgrading and smart buildings.
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	-New and updated tools that are able to integrate other solutions in a larger smart energy infrastructure at city level. -Solutions to connect and integrate the smart energy infrastructure with an automatic energy trading platform.

2. Alba Iulia Municipality SP2 Solutions

No solutions are planned for SP2 at this point.

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3. Alba Iulia Municipality SP3 Solutions

ALB 3.1 – Rehabilitation works for energy efficiency and creation of the infrastructure for a self-consumption system at Dorin Pavel High School complex of buildings

Solution Overview	
Description	Rehabilitation works and infrastructure for a self-consumption system (energy produced by renewable sources that are close to the consumers and they are associated to them) for the High School complex of buildings. The solution will distribute energy produced by PVs on the roof of the main building to the dormitory, the workshop, the cafeteria, the sports hall and the heat pump buildings.
Involved actors and their role	- Alba Iulia Municipality: Responsible beneficiary, coordination and implemention Ministry of Development, Public Works, and Administration - Investment Coordinator for the National Recovery and Resilience Plan, Component 5 - Renovation Wave -STIGMA BUILDING MANAGEMENT S.B.M. S.R.L
Key Contact Person	Claudia Canta – Alba Iulia Municipality Investments Dep
Expected Delivery Date	Dec. 2026

ALB 3.1 Solution Status M12

Status Overview

Planning progress

Implementation progress

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	-Feasibility site study finalized. -DALI (Documentation for Works Approval Interventions) completed and accepted.
Which actions are currently underway?	-Planning the rehabilitation works. -Planning to connect the main building with the other 5 to use renewable energy produced.

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Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-Failure to submit suitable bids within the prescribed procurement timeframe. -Difficulty finding providers of such a cutting-edge system.
Do these affect other solutions? If yes, which ones and how?	The solution influences directly ALB 1.3. The smart energy system cannot be built entirely until ALB 3.1 is finished.
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	No.

Next Steps

Please briefly outline the overall next steps for this solution	-Drafting the public tender for the acquisition of the system (replacement of dysfunctional PVs, new inverters, new monitoring platform). -Creation of the task book for the on-site works -The execution of the connectivity between the 6 buildings -Execution of the specific technical measurements in terms of energy parametres. -Connection to digital systems -Start operation
What actions are planned for the next semester?	The public tender of the works and the beginning of the execution of the system linkage.

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	Not at this point.
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	Not at this point.
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	Not at this point.

ALB 3.2 - Create new PEB Campus within PCED Area (CRESCENDO)

Solution Overview

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Description	The project "CRESCENDO" is aimed at building the first net zero dual-educational campus in Alba Iulia Municipality through a project financed under the National Resilience and Recovery Fund. The project envisages the construction of an energy efficient campus, on a surface of over 25.000 sqm for over 300 students. The project CRESCENDO was submitted for financing in 2023 and is now on the waiting list to receive funding (expected in 2024). More info about the project here: https://proiecte.apulum.ro/
Involved actors and their role	A total of 20 partners are involved in the project: - Alba Iulia Municipality: coordination -Companies and educational institutions facilitate the educational and professional program. -Educational partners: management and operation after the construction is finalised
Key Contact Person	Maria Seemann, Public Manager
Expected Delivery Date	30 June 2026

ALB 3.2 Solution Status M12

Status Overview

Planning progress

									100%

Implementation progress

10%									

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	The project CRESCENDO was submitted in June 2023. After receiving an initially low evaluation the grade was revised, making the project eligible for funding. In January 2024 the project received funding confirmation.
Which actions are currently underway?	The Feasibility Study and other technical documents are currently in preparation for the project's funding approval. The project was admitted end of 2023. Currently, the Coordinator (Municipality) and the partners are

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	working on the Partnership Agreement and signing the Grant Agreement with the financing body – Ministry of Education.
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	Risk that some of the partners (especially private operators) would abandon the consortium, however the consequences would be minimal since other private operators could replace them. -Risk that the private operator procurement to build the educational campus is contested. Although resolvable, this would delay the whole process. -Risk that activities will not be finalized until June 2026, however this risk is mitigated through an outstanding project implementation plan and an experienced team.
Do these affect other solutions? If yes, which ones and how?	No.
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	-The submission of the project in time -Responding to the clarifications in time -Getting the project admitted successfully

Next Steps

Please briefly outline the overall next steps for this solution	- Formalising local partnership. - Procurement for technical documentation, execution of construction works, information, dissemination and equipment. - Construction and supervision of works. -Reception of the works and operationalisation. - Beginning of educational programs
What actions are planned for the next semester?	-Formalisation of partnership with all local companies involved -Public tenders for technical documentation, information and dissemination, execution of construction works, acquisition of equipment etc.

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Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	Timing is everything to implement large projects, you need a project team to build a dream! Cooperation within large local consortiums starts with informal meetings, which need to be frequent to keep the interest high!
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	Not yet.
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	Not yet.

ALB 3.3 - Upgrade public lighting to LED

Solution Overview

Description	The gradual replacement of the old and inefficient public lighting, alongside its power and control network, has become a priority for the municipality. The new system based on LED lamps, dispatch and dimming, special lamps with sensors for crossings, new power lines and lamps with PV and batteries for remote areas, is totalising about 14 mil Euro (Regional Operational Funds, Environment Fund Administration) and includes in the PCED area 417 new poles, 622 LED lamps, 18 km of power lines, 38 pedestrian crossings with variable light, and cloud dispatch. Energy consumption will be reduced with 116 MWh/year (representing 16% of total system energy reduction), and emissions with 28 tCO2/year in the PCED area.
Involved actors and their role	-Alba Iulia Municipality, project submission and implementation, co-funding, beneficiary -Center Regional Development Agency - ROP administrator -AFM (Environmental Fund Administration) -Flash Lighting - implementation partner and operator of the public lighting system -Subcontractors specialized in construction works and electrical installations
Key Contact Person	George Edves – Public utilities Department.; Ovidiu Podaru – Alba Iulia Municipality
Expected Delivery Date	Summer 2024

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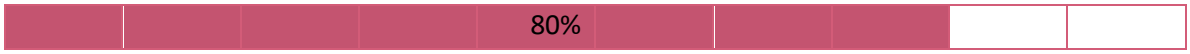
ALB 3.3 SolutionStatus M12

Status Overview

Planning progress

Implementation progress



In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Implementation / partial operation
What has been concluded in the last semester?	-Installing over 200 new poles and LED lamps, power network -Integration of new lamps in dispatch app
Which actions are currently underway?	-Finalising implementation -Restoring sidewalks
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	Minor changes in timeline and technical modifications according to existing conditions

Risks and Challenges

Which risks and challenges is the solution facing?	-Implementation in parallel with other major infrastructure projects -Discomfort in specific areas -Reduced number of local companies/ workforce able to implement big projects
Do these affect other solutions? If yes, which ones and how?	-
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	Yes, for the most part, especially in reducing the discomfort created by the works, by using the old and the new system in parallel for short periods

Next Steps

Please briefly outline the overall next steps for this solution	-Installation of remaining network, poles, lamps, ignition points, integration - Reception of construction works
What actions are planned for the next semester?	-Finalizing the new public lighting system

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	-Analyse various solutions considering the entire lifecycle of the system -Collaborate with experienced and authorized companies

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Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	-Description of the solution for public lighting dispatch https://www.flashnet.ro/project/intelilight/
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	-Integration of various solutions (mobility traffic/parking, public lighting, safety, buildings) in a municipal dispatch

4. Alba Iulia Municipality SP4 Solutions

ALB 4.1 – Building new lanes for bikes, e-bikes, cargo bike

Solution Overview

Description	The urban public transport network in Alba Iulia is being rehabilitated. This includes the creation of new protected bike lanes placed on the sidewalks of the main avenues within the PED. From the 6 km submitted in the initial proposal, 3 km are located in the current boundaries of the PCED (see Figure 2)
Involved actors and their role	- Alba Iulia Municipality, project submission and implementation, co-funding, beneficiary -Center Regional Development Agency - ROP administrator -ELIS PAVAJE SRL – execution of works -TOBIMAR GROUP SRL – execution of works -BARELI SRL – supervisor of works -SYSTEGRA ENGINEERING SRL-SCOPE SYSTEMS SRL- S.C. SWARCO Traffic Romania S.R.L. - project supervisor - BEGLI EVENTS SRL - communication
Key Contact Person	Claudia Canta – Alba Iulia Municipality Investments Dep
Expected Delivery Date	December 2024

ALB 4.1 Solution Status M12

Status Overview

Planning progress

100%

Implementation progress

80%

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Implementation

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What has been concluded in the last semester?	-In the area of the PCED, the planned bike lanes are over 50% ready
Which actions are currently underway?	-Implementation and Adoption of the Technical Project (PT + DDE) and Provision of Technical Assistance -Provision of Site Management Services-Execution of Works
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	Construction was delayed due to the position of electrical power poles along a significant portion of the route and the consequent revision of the technical project.

Risks and Challenges

Which risks and challenges is the solution facing?	-Technical and bureaucratic issues (blocked procurement procedures, appeals, information requests, etc.). -Outstanding requests for clarification or documents addressed by the municipality of Alba Iulia to various institutions, to which no response has been received. -Accumulation of delays in the project implementation.
Do these affect other solutions? If yes, which ones and how?	-No.
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	The project implementation period was successfully extended until 31.12.2024.

Next Steps

Please briefly outline the overall next steps for this solution	-The construction of another approximately 3km bike lines
What actions are planned for the next semester?	-Finalisation of construction works, communication activities and reception of works are to be made.

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	Not at this point.
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	Not at this point.
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	Not at this point.

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5. Alba Iulia Municipality SP5 Solutions

ALB 5.1 – Engage local stakeholders – Intelligent Cities Challenge (ICC)

Solution Overview

Description	To minimise emissions and energy consumption, enterprise solutions identified with international experts will be proposed to companies in the PCED area. Smaller solutions for citizens will be prepared for the City Hall information office, together with energy poverty measures, RES systems and financing grants. This will be done in the context of the Intelligent Cities Challenge (ICC), a European Commission initiative supporting cities towards the green and digital transition through Local Green Deals (LGD). As a Core City in ICC initiative, Alba Iulia is implementing an LGD with local stakeholders, to improve strategies, project prioritisation and implementation in Energy, Mobility and Tourism and scaling solutions at city scale.
Involved actors and their role	-EU Commision: ICC Coordination -Helpdesk team: general strategy -Local ICC implementation expert: consultancy on LGD implementation -International domain experts in energy, mobility and tourism: identifying priorities/ solutions -Alba Iulia Municipality: Implementation team, signing local green deals, collaborating with SME and citizens in PCED area/ city local stakeholders - Local experts, companies / institutions from focus domains, partners in LGD: consultancy and implementation of solutions
Key Contact Person	Catalina Rotaru – Tractebel, ICC implementation expert Valentin Voinica – Project manager, Alba Iulia Municipality
Expected Delivery Date	Summer 2025

ALB 5.1 Solution Status M12

Status Overview

Planning progress

50%							

Implementation progress

	30%						

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In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning and starting implementation
What has been concluded in the last semester?	-Application to ICC programme -Initial documentation and planning -First meeting with local stakeholders -ICC Strategy Lab
Which actions are currently underway?	-Starting city report, stakeholders matrix
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No

Risks and Challenges

Which risks and challenges is the solution facing?	-Engaging and involving local stakeholders as volunteers in local strategies and projects -Complexity of project needs constant support -Communication and harmonization of different opinions
Do these affect other solutions? If yes, which ones and how	If materialised, these risks would not contribute to ALB 1.1 and 3.1 (improvements in Dorin Pavel High School).
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	Yes, first stakeholder's meeting was successful and generated ideas of future collaborations. Majority of stakeholders want to be involved in existing and future projects, including those in the PCED area.

Next Steps

Please briefly outline the overall next steps for this solution	-Prepare first chapters of city report -Decide on stakeholder's list and involve them in next activities
What actions are planned for the next semester?	-Second local stakeholders meeting -Allocating tasks and responsibilities -Identify priorities for selected domains (energy, mobility and tourism)

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	-Select significant local stakeholders for each domain -Personally invite them to meet the implementation team and identify win-win solutions
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	Starting point are existing city strategies (like Integrated Development Strategy, Smart City Strategy, SUMP, Sustainable Energy and Climate Plan, etc. Some of them available in English here https://www.apulum.ro/index.php/primaria/documente).
Are there specific aspects of this solution that you would like to receive	Public – private partnerships without any commercial implications.

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advice or support from your Community of Practice?	

ALB 5.2 – Organization of a Climathon

Solution Overview

Description	The municipality will organize the second Climathon event in Alba Iulia. The event will be attended by students from the local university 1 Decembrie 1918 Alba Iulia, who will have the occasion to propose innovative ideas about energy efficiency and climate change related to the PCED Area and to debate them during the one-day event. The event will be juried, and all participants will receive prizes for their active participation. Further engagement activities will be planned based on the Climathon.
Involved actors and their role	-Aba Iulia Municipality: coordination Students from the 1 Decembrie 1918 University Alba Iulia: Participants / presenters —
Key Contact Person	Tudor Drambarean – Project manager, Alba Iulia Municipality Liviu Stanciu - Technical Expert, Alba Iulia Municipality
Expected Delivery Date	Spring 2024

ALB 5.2 Solution Status M12

Status Overview

Planning progress

				50%					

Implementation progress

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	Discussions with local stakeholders about next event in 2024
Which actions are currently underway?	Planning the event
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No. Possible change of location to the University site.

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Risks and Challenges

Which risks and challenges is the solution facing?	No risks associated
Do these affect other solutions? If yes, which ones and how?	No
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	No

Next Steps

Please briefly outline the overall next steps for this solution	-Setting up of rules and details for the next Climathon -Partnership with the local University for implementing the action in 2024 -Discussing with potential moderators of the event. -Identifying future citizen engagement activities based on Climathon
What actions are planned for the next semester?	-Same as above (Climathon takes place in Spring 2024)

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	Climathon events are a great activity for students, but also for municipalities & universities which learn from the solutions proposed for climate change mitigation. All participants must receive a participation certificate so that there are no differences and discouragements between them. Experienced mentors are very important to really capture the attention of participants throughout the whole day.
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	https://climathon.climate-kic.org/
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	How other cities capitalised the Climathons' results.

6. Alba Iulia Municipality SP6 Solutions

No Solutions are planned for SP6 at this point.

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Alba Iulia Conclusions: M12

The solutions presented above are part of the Alba Iulia Municipality strategy to become a more sustainable and smarter city. The integration of renewable energy sources, energy-efficient technologies, and smart infrastructure within the PCED creates a core of technological projects meant to establish Alba Iulia as an EU city heading the right direction of development. However, challenges such as initial capital investment, public awareness, and regulatory frameworks need careful consideration on behalf of the municipality and stakeholders involved. The success of these initiatives is based, starting the first day of the projects, on collaborative efforts between government bodies that administrate the funds, private sectors as the main coordinator of the effective works, and, of course, local communities. By addressing these challenges, Alba Iulia has the potential to serve as a model for other cities aspiring to create resilient and environmentally conscious urban spaces.

Moreover, building a PCED area takes a lot of effort starting from the legislative perspective and moving over to the technical and social perspective. All three are important and at least two of them are at the hand of local authorities, the legislative part being on the side of the Parliament.

Figure 2. Alba Iulia's PCED map from a workshop session. In white, the refined PCED polygon, with the Dorin Pavel School in the south-east (in green).

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ASCEND

Accelerate poSitive
Clean ENergy Districts

Budapest PCED Book

Implementation status report – M12

Project: Accelerate poSitive Clean ENergy Districts
Grant Agreement No.: 101096571
Deliverable No.: D4.2 Five PCED Books
WP: 4
Date: January 22, 2024
Status: Final
Version: v2
Dissemination level: Public

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Version History

Date	Person	Action	Status	Dissemination
13.10.2023	S. Oviedo, E. Blanco	Sent for feedback	Template (Draft)	MCs, Coordination
31.10.2023	S. Oviedo, E. Blanco	Submitted to MCs	Template (Final)	MCs
07.12.2023	D. Lénárt	Sent for review	Draft	ENC
07.12.2023	S. Oviedo, E. Blanco	Reviewed Draft, sent for peer-review	Reviewed Draft	AIT, CARTIF
11.12.2023	Z. Shokufeh	Peer-reviewed Draft v2	Peer-Reviewed Draft (1/2)	CARTIF, ENC
12.12.2023	R. Simón de Lama	Peer-reviewed Draft v2	Peer-Reviewed Draft (2/2)	ENC
14.12.2023	S. Oviedo	Revised document, updated status formats	Draft for city review	MCs
08.01.2024	D. Lénárt	Sent for review	Draft v2	ENC
11.01.2024	S. Oviedo, E. Blanco	Reviewed Draft v2	Reviewed Draft v2	BUD
18.01.2024	D. Lénárt	Sent for review	Draft v3	ENC
22.01.2024	S.Oviedo, E. Blanco	Edited Draft v3	Final v1	Coordination Team
20.02.2024	B. Gaiddon	Reviewed Final v1	Sent for Revision	ENC
21.02.2024	S. Oviedo	Corrected typos	Final v2	Coordination Team

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Table of Contents

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Budapest Executive Summary: M12

The current report gathers the progress of Budapest´s PCED during 2023. The local consortium´s focus has been to contact stakeholders, identify common interests and needs, develop solutions for, and build cooperation.

In **SP1**, we would like to perform collaborative data collection involving the academic sector and public utility companies, collecting geodata, census data for the residential buildings, and energy consumption on the building block level and preferably at the individual building level. Then we would use the collected data for modelling current and future energy balance scenarios. Within **SP2** we aim to develop a feasibility study for establishing RECs around the production areas, through the involvement of local stakeholders and the support of national NGOs. **SP3** focuses on the refurbishment of a former school into NZE (Near Zero Energy) co-housing. With a highly innovative solution, we aim to launch a pilot project for a heat exchange and heat pump system, developed by the local potable water company, providing the school with fossil-free heating and cooling. The aim of **SP4** is to develop e-mobility points and combine shared mobility with public transport, to promote modal shift. There is a special focus on streets with schools to raise awareness and provide a safer and healthier environment for children. We will also implement traffic calming measures in school roads. By establishing an energy advisory service in **SP5**, we would like to help citizens in the energetic renovation of their homes by encouraging the use of renewable energies. Within **SP6** we aim to enhance cooperation with the stakeholders, namely Budapest Municipality, District IV municipality (local administration), Local stakeholders (business owners, citizens, NGOs, etc.) and infrastructure companies (electricity, water, etc.) – to promote the organization and establishment of PCEDs in the District IV.

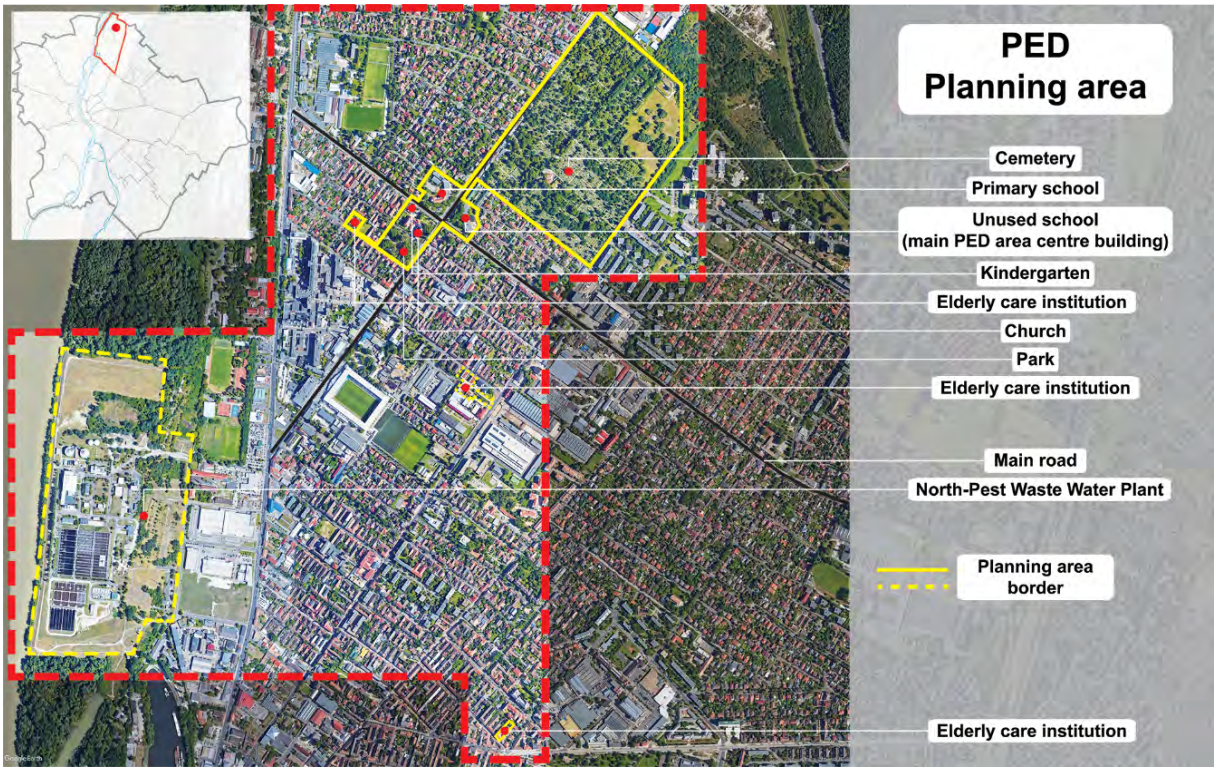

Figure 1. PED planning area. Image by Municipality of Budapest based on Google Earth imagery.

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Budapest: Summary of Solutions

SP1	Digital Infrastructures and Tools for Flexible Energy Systems and PCED
BUD 1.1	Realize a data governance framework for the PCED
BUD 1.2	Create a GIS-based digital twin and development of energy scenarios

SP2	Deployment of Energy Communities and Prosumers
BUD 2.1	Develop feasibility study of energy communities and prosumers in the PCED

SP3	Energy-efficient Buildings Integrating RES, Storage and Frugal Solutions
BUD 3.1	Refurbish school building for high energy performance and adaptive reuse as mixed-use housing
BUD 3.2	Pilot heat exchange system using potable water pipeline

SP4	Decarbonisation of Mobility and Freight Logistics
BUD 4.1	Plan (e-)mobility points/stations
BUD 4.2	Examine possible urban logistics solutions (parcel lockers, etc.)
BUD 4.3	Deploy traffic calming measures on school roads

SP5	Citizen-Centric Solutions and Co-creation along the Governance Chain
BUD 5.1	Engage local stakeholders
BUD 5.2	Reinstall local consultancy service for energy and climate transition

SP6	Urban Developer for PCED as an Umbrella Solution
BUD 6.1	Establish PCED taskforce with District IV Municipality

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1. Budapest SP1 Solutions

BUD 1.1 – Realize a data governance framework for the PCED

Solution Overview

Description	The action consists of data collection, management from the local PECD area buildings, infrastructure and other important elements. Collection of geodata, census data for the residential buildings, and energy consumption at least at the building block level. Because of possible data sensitivity, data management is restricted to the Municipality of Budapest only. This involves mapping the status and preparing the modelling process
Involved actors and their role	-Academic sector: data collection -Hungarian Solar Energy Association: Solar Map (already created) -Public utility companies: data providers -Subcontractor: field survey of buildings
Key Contact Person	Tamás Soha - Budapest, Department of Climate and Environmental Affairs
Expected Delivery Date	2025 (Q9)

BUD 1.1 Solution Status M12

Status Overview

Planning progress:

20%								

Implementation progress:

10%								

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning, partly implemented (Solar Map and Data governance department created)
What has been concluded in the last semester?	-Solar Map has already been created and is ready to utilize -Partial data collection on buildings has been undertaken
Which actions are currently underway?	-Collecting further data on building's energy consumption (and production in some cases),

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	technical and social attributes by using both statistic from the last census and field questionaries.
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-Involving public utility companies to be partners and provide data -Building data collection by dedicated personnel and its effectiveness/coverage. The survey depends on the availability of further funds.
Do these affect other solutions? If yes, which ones and how?	-The success rate of this solution may affect BUD 1.2, which is based on this one.
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	-Some utility providers (specifically Sewage system operators) are very supportive and likely to provide data

Next Steps

Please briefly outline the overall next steps for this solution	-Data collection and management within the PCED area borders
What actions are planned for the next semester?	-First, we define the final borders of the PCED by using relevant and already existing information on the building stock and its spatial distribution, as well as public utility (e.g. low-level power line) areas, in addition with local experts' knowledge and suggestions. -After the preparation, data collection, will be implemented by combining the field survey data and the census (and other official) data. Then the data will be managed, stored and connected to dedicated GIS layers as attribute tables. This is the preparation for BUD 1.2.

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	It is quite difficult to collect data because of GDPR and industrial secrets
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	HotMaps can help to determine a given area's heat demand.

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Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	Methodology on how to collect data of buildings on a large scale (i.e. remote sensing) without existing official databases.

BUD 1.2 – Create a GIS-based digital twin and development of energy scenarios

Solution Overview

Description	Continuing the progress in BUD 1.1, we use the collected data for modelling current and future energy balance scenarios. Modelling is planned to be made using GIS, and energy modelling software (EnergyPlan, LEAP, City Energy Analyst etc.). By storing and managing the data (current and modelling results), it can be considered as a digital twin for energy sector of the PCED. The twin can be used by decision makers, urban planners and other stakeholders to help their planning processes.
Involved actors and their role	-Mostly by the Municipality of Budapest -Academic sector (HUN-REN Centre for Energy Research)
Key Contact Person	Tamás Soha,, Budapest, Department of Climate and Environmental Affairs
Expected Delivery Date	2026 (Q13)

BUD 1.2 Solution Status M12

Status Overview

Planning progress

10%									

Implementation progress

0%									

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	Reviewed the potential energy modelling software
Which actions are currently underway?	Selection and procurement of the proper software.

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Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No. We try to use free software or select one that can be purchased for a reasonable cost, which seems successful so far.

Risks and Challenges

Which risks and challenges is the solution facing?	-Effectiveness and completeness of the data collection, extrapolation for buildings with unknown data -Lack of some important data regarding the buildings, since the last census data is still yet to be published by the authority (expected to be published in 2024, Q5).
Do these affect other solutions? If yes, which ones and how?	-BUD 2.2: If we don't know the attributes of buildings as consumers, it may be difficult to find the right members for energy community
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	-Not yet.

Next Steps

Please briefly outline the overall next steps for this solution	Next steps are determined by the available data and software, therefore the planning of this solution is yet to be done.
What actions are planned for the next semester?	-Review the proposed and define the final borders of the PCED area. -Processing the available (official census) data on building energy demand and survey data. -Collecting data regarding renewables' potentials, namely solid biomass, biogas, ambient heat (including waste heat and geothermal). Solar potential is already known. -Integration of supply and demand side using energy modelling Creating energy scenarios (based on data quality and quantity) -Reporting of the results spatially (GIS) by maps and figures, and the energy balance of the PCED area by figures and diagrams. Also comparing the different scenarios and suggesting different

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	development opportunities as pathways to follow or avoid in the PCED.

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	Not all of the inspected energy modelling applications are free to use, and some of the others require advanced user knowledge.
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	We have not found such resources, yet.
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	We are happy to know more of the above-mentioned software, applications!

2. Budapest SP2 Solutions

BUD 2.1 – Develop feasibility study of Energy Communities and Prosumers in the PCED

Solution Overview

Description	Develop a feasibility study for establishing RECs around the production areas, through the involvement of local stakeholders, and help from national NGOs.
Involved actors and their role	-National NGOs working with RECs (not contacted yet) -IV. District Municipality (local administration) -Local Stakeholders - DSO - Local industrial and commercial actors
Key Contact Person	Daniel Hedari – Sustainable Cities referent, Municipality of Budapest
Expected Delivery Date	2025 (Q10)

BUD 2.1 Solution Status M12

Status Overview

Planning progress

10%									

Implementation progress

0%									

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In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	-
Which actions are currently underway?	-Identify and contact local stakeholders
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-Legislative barriers to establishing a REC -Insufficient in-house capacity for providing technical support for their development -The current ban on grid feed-in
Do these affect other solutions? If yes, which ones and how?	-Challenges and risks of SP2 do not affect other solutions in a significant way. However, the effectiveness of SP2 will highly depend on SP1's results in data generation and management.
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	-Began discussion and information dissemination of REC and PCED in another project (ATELIER - https://smartcity-atelier.eu/)

Next Steps

Please briefly outline the overall next steps for this solution	-Identify and contact possible actors within the area, who could be participants of EC's -Identify the energy portfolios of different actors -Based on locality, connections and energy portfolios, group actors into EC's
What actions are planned for the next semester?	-Discover possibilities of REC's configurations (different energy portfolios) -Form stakeholder groups, who can 'think' together how to establish RECs

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	As an important renewable energy source within REC, we learned a lot about solar panel installation in historically relevant/protected urban areas
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	-We are partners in ATELIER, where REC and PED are the core topics. -Solar potential map of Budapest

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Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	How to establish REC in a restrictive legal environment? How to involve/motivate stakeholders without direct compensation?

3. Budapest SP3 Solutions

BUD 3.1 – Refurbish school building for high energy performance and adaptive reuse as mixed-use housing

Solution Overview

Description	The aim of this solution is to retrofit an old school building into a NZE (Net Zero Energy), mixed-use, co-housing facility. This involves implementing energy reduction measures, changes in tenant energy usage and the incorporation of an innovative heat exchange system. Ground-level offices including a municipal consulting office and shared spaces will be combined with 42 co-housing apartments of various sizes.
Involved actors and their role	-Municipality of Budapest: Coordination -Chief architect's office (Budapest) & a design firm tbd: Refurbishment plans IV. District Municipality -Budapest Waterworks: Heat pump system installation plan -Utility companies: Technical validation for RES installations - Municipal Property Management company (BFVK), who manages the building
Key Contact Person	Almos Papp, Municipality of Budapest City Planning Department
Expected Delivery Date	2025 (Q10) - delivery of plans

BUD 3.1 Solution Status M12

Status Overview

Planning progress

10%									

Implementation progress

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In which phase is the project? (Planning, Implementation, Operation, Evaluation)	**Planning**
What has been concluded in the last semester?	-Drafting the concept for the desired design specification - Gathering and engaging stakeholders
Which actions are currently underway?	-Tender preparation for the process of selecting a design firm
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-Finding financial support for the implementation of non-residential functions of the building -Financial support/plan to implement RES in the building
Do these affect other solutions? If yes, which ones and how?	-This solution will feed BUD 1.1 and 1.3, as digital solutions will collect and manage data from this building, its operation, and renewables production. This solution would also contribute to BUD 2.1.
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	-Established new stakeholder connections in order to further develop the concept

Next Steps

Please briefly outline the overall next steps for this solution	-Initiating the tender process, -Finding the right design team, -Starting an analysis of the solution design -Delivery of building permit plans -Delivery of construction plans
What actions are planned for the next semester?	-Stakeholder engagement (in detail information coordination with district municipality about the involved properties; stakeholder workshop about the expected project details, local community participatory processes for mapping the needs and gathering local knowledge) -Start of the concept design

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Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	Not yet
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	We have engaged in another PED concept previously through the project ATELIER, lessons learned, and the design study will be used (such as, what are the important building properties for PED, and other preferences for PED concept design)
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	If there was a similar project where they retrofitted an existing building to be NZE building and used as part of a PED.

BUD 3.2 – Pilot heat exchange system using potable water pipeline

Solution Overview

Description	The school will act as a pilot project for an innovative heat exchanger and heat pump system. Developed by the local potable water company, the system draws energy from the main potable water pipe that runs in front of the school. As 4 lines meet the 0.2 m/s requirements of the system, there is potential to create heat centres for distribution in the PCED in the future.
Involved actors and their role	-Municipality of Budapest and Budapest Waterworks: Coordination -Budapest Waterworks: Heat pump system installation plan + Technical validation
Key Contact Person	Almos Papp, Municipality of Budapest City Planning Department
Expected Delivery Date	2025 (Q10) - delivery of plans

BUD 3.2 Solution Status M12

Status Overview

Planning progress

10%									

Implementation progress

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In which phase is the project? (Planning, Implementation, Operation, Evaluation)	**Testing a prototype at a different location**
What has been concluded in the last semester?	-Stakeholder engagement -Realizing a concept for a business model to have a revenue structure for the investment -Drafting a concept for the technological solution and the operational needs -Aligning the solution with local strategies (SECAP of Budapest, Integrated Urban Development Plan of Budapest, Sustainable New City Parts of Budapest Manual, Smart Budapest (Smart City Framework Strategy), Environmental Protection Program of Budapest, Green Infrastructure Project of Budapest, and the BW sustainability plan) and mapping its replicability
Which actions are currently underway?	-Testing of the prototype
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-Implementing a business model for the solution (including CAPEX and OPEX) -creating the right energy use behavior that can match with the operation of the solution -the need for change of the full heating system of the building
Do these affect other solutions? If yes, which ones and how?	-The heating and cooling system design of the building of BUD 3.1. relies strongly on this solution
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	There were no specific challenges in this regard so far.

Next Steps

Please briefly outline the overall next steps for this solution	-Start of the design of the system to be implemented according to the building's need
What actions are planned for the next semester?	-Study of the future energy requirements of the building and the start of the design of the mechanical system

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Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	Not yet.
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	Not yet.
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	It would be interesting to see cost-effective heating and cooling systems in NZE buildings which can be used with this kind of heat exchanger.

4. Budapest SP4 Solutions

BUD 4.1 – Plan (e-)mobility points/stations

Solution Overview

Description	The aim of this solution is to develop e-mobility points to promote a modal shift through the combination of shared mobility and public transport, including e-mobility. The e-mobility points are dedicated parking spaces for micro-mobility vehicles, shared cars and e-scooters. In a later stage, these points can be further developed as e-mobility stations with extended mobility and logistics solutions.
Involved actors and their role	- Municipality of Budapest: Coordination - BKK Centre for Budapest: mobility manager of Budapest - Municipality of the IV. District - Shared mobility service providers - E-mobility service providers - Logistics operators
Key Contact Person	Aletta Büki, BKK
Expected Delivery Date	2025 Q4

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BUD 4.1 Solution Status M12

Status Overview

Planning progress

20%								

Implementation progress

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	-BKK and the district started cooperating to install micro-mobility points (Mobi points) in the district. At first, they will be installed south of the PCED. The Mobi points network plan for this area is completed.
Which actions are currently underway?	-Planning of micro-mobility points in the district
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No

Risks and Challenges

Which risks and challenges is the solution facing?	-Integration of e-mobility points into the existing network of (micro)mobility points, expansion of the service area -Engaging shared mobility service providers and e-mobility service providers
Do these affect other solutions? If yes, which ones and how?	No
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	The planning of the micro-mobility points has already started, which is the basis for further developments

Next Steps

Please briefly outline the overall next steps for this solution	-Plan the mobility points network -Identify the possible location -Involve the relevant stakeholders -Examine the feasibility (cost, time, etc.) -Deploy the mobility points, possibly upgrade to e-mobility points.
What actions are planned for the next semester?	-Planning of the mobility points network

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Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	-
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	-Mobility Points Concept of Budapest with 3 service levels (micro-mobility points, mobility points, mobility stations) is based on Cities-4-People project (ended in 2020). -USER-CHI project (https://www.userchi.eu/) – first e-mobility stations in the city
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	-

BUD 4.2 – Examine possible urban logistics solutions (parcel lockers, etc.)

Solution Overview

Description	The aim is to assess the current logistics situation (e.g. public space use needs, traffic data, freight volume, etc.) in the PCED area and to develop solutions to improve the efficiency and sustainability of freight transport systems. In addition to the city logistics methodology, early next year, a curb side management framework will be developed in Budapest which can also be used for the assessment of public space in the PCED area—and its redesign for logistics purposes, among others.
Involved actors and their role	- Municipality of Budapest: Coordination - BKK Centre for Budapest: mobility manager of Budapest - Municipality of the IV. District -Logistics companies (general cargo, parcel deliveries, etc.) -Local shops, businesses -Local citizens
Key Contact Person	Aletta Büki, BKK
Expected Delivery Date	2025 Q11

BUD 4.2 Solution Status M12

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Status Overview

Planning progress

20%								

Implementation progress

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	-
Which actions are currently underway?	The methodology for the base situation assessment is under development
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No

Risks and Challenges

Which risks and challenges is the solution facing?	-Coordination between different stakeholders -Gathering data related to logistics -Lack of funding for implementing different solutions
Do these affect other solutions? If yes, which ones and how?	No
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	There wasn't significant progress in the last semester.

Next Steps

Please briefly outline the overall next steps for this solution	-Identify the exact study area -Assess the base situation of urban logistics in the PCED with a city logistics methodology -Involve the relevant stakeholders -Develop proposals for urban logistics solutions (e.g. installation of parcel lockers) -Examine feasibility (cost, time, etc.)
What actions are planned for the next semester?	-Identify the exact study area -Involve the relevant stakeholders

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	Based on previous experiences from projects: -City logistics data is crucial for any logistics related developments – creation of data-sharing cooperation is ongoing

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Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	-Preparation of the Sustainable Urban Logistics Plan of Budapest -LIFE HungAIRy project – installation of minihubs and loading area booking system for loading/unloading areas. -GRETA project – curbside management pilot, focusing on city logistics activities
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	Good practices and experiences from other cities related to urban logistics solutions

BUD 4.3 – Deploy traffic calming measures on school roads

Solution Overview

Description	The city aims to deploy programs for roads with schools along them, integrating traffic calming measures with awareness raising to provide a safer and healthier environment for children. This will be done in close cooperation with local associations, BKK and the district.
Involved actors and their role	-Municipality of Budapest & BKK: Coordination
Key Contact Person	Almos Papp, Municipality of Budapest, City Planning Department
Expected Delivery Date	2025 (Q9)

BUD 4.3 Solution Status M12

Status Overview

Planning progress

70%					

Implementation progress

50%					

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Start of implementation phase
What has been concluded in the last semester?	-planning and detailing of the actions -pilot implementations at different locations (beyond the PCED area)

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Which actions are currently underway?	Start of implementation at the local school of the PCED area
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-No risks. Minor chance for car-driving parent opposition could be a challenge
Do these affect other solutions? If yes, which ones and how?	No.
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	No.

Next Steps

Please briefly outline the overall next steps for this solution	-Installation of colourful "Schoolzone" signs in the streets in front of and near the local school and related pavement painting -the creation of well-organised parking areas and Kiss&Drive parking spaces for short stops -the installation of flower boxes as barriers to encourage drivers to reduce speed (by narrowing the roadway)
What actions are planned for the next semester?	-Install colourful "Schoolzone" signs in the streets in front of and near the local school and related pavement painting -Create well-organised parking areas and Kiss&Drive parking spaces for short stops -Install flower boxes as barriers to encourage drivers to reduce speed (by narrowing the roadway

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	No.
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	Good practices from Hungary and abroad were used for good resources and references -Sulizóna-program (bkk.hu) -Schools with street-calmed environments | Barcelona City Council

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5. Budapest SP5 Solutions

BUD 5.1 – Engage local stakeholders

Solution Overview	
Description	The city aims to engage local stakeholders at the district level to raise awareness amongst citizens to reduce their environmental impacts. This will be done in close relation with local associations (such as, Solidarity Economy Center) and the district.
Involved actors and their role	-Municipalities of Budapest & District IV: Coordination -Local associations and citizens: participants -Local schools: knowledge redistributors and participants
Key Contact Person	Almos Papp, Municipality of Budapest City Planning Department
Expected Delivery Date	2025 (Q10)

BUD 5.1 Solution Status M12

Status Overview

Planning progress

10%									

Implementation progress

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning Phase
What has been concluded in the last semester?	-Idea collection -Initial mapping of potential participants through engagement with district municipality -PCED stakeholder meeting and ASCEND project introduction
Which actions are currently underway?	-District municipality -The project was presented to Solidarity Economy Center (NGO), which is in contact with citizens interested in energy community

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	initiation, future collaboration regarding this project would be favourable.
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-Capacity to locate all potential local community members -Engaging local schools could be a challenge
Do these affect other solutions? If yes, which ones and how?	-no
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	Not applicable yet.

Next Steps

Please briefly outline the overall next steps for this solution	-Initiating citizen co-production event, citizen engagement and other participatory processes -Stakeholder meeting about the possible citizen-centric solutions in the project area
What actions are planned for the next semester?	-Local community engagement workshop -Stakeholder meeting about the possible citizen-centric solutions in the project area

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	-
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	-
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	-

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BUD 5.2 – Reinstall local consultancy service for energy and climate transition

Solution Overview

Description	The consultancy service will provide assistance and information regarding energy efficiency, sustainability, climate adaptation, waste management, air quality improvement objectives, measures, and tenders. Helping in the energetic renovation of citizens' homes and PV installation with comprehensive advice, also in technical, financial and legal matters. It is currently in interrupted operation, as its location was taken over by 'Budapest helps' office for Ukrainian refugees, solution is in progress, and it is waiting for restart
Involved actors and their role	-Climate department of the Municipality of Budapest: Coordination, operation of the service, installation of local consultancy service as part of a One-Stop Shop
Key Contact Person	Almos Papp, Municipality of Budapest, City Planning Department
Expected Delivery Date	2024 (Q6)

Project Status M12

Status Overview

Planning progress

10%									

Implementation progress

	40%							

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	
What has been concluded in the last semester?	-no applicable actions
Which actions are currently underway?	-no actions yet.
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-Right now, the service lacks a location where it can continue its operation.

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Do these affect other solutions? If yes, which ones and how?	-no
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	-no.

Next Steps

Please briefly outline the overall next steps for this solution	-Finding a new location or locating back to the old one, if its space frees up from the current overtaking function. Later on, this service can be expanded in the main building of the PCED into the One Stop Shop, after the building is retrofitted.
What actions are planned for the next semester?	-Possible reopening of the service if possible

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	No.
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	No.
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	No.

6. Budapest SP6 Solutions

BUD 6.1 – Establish PCED taskforce with District IV Municipality

Solution Overview

Description	We are planning to form a taskforce focusing on the promotion, organization and deployment of PCEDs in the IV. District.
Involved actors and their role	-Budapest Municipality: coordination, information dissemination -IV. District municipality: provide local knowledge, coordination.

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	-Local stakeholders (business owners, citizens, NGOs, etc.) – active participants, to become members of taskforce -Utility companies – aid in the development and longevity of the taskforce
Key Contact Person	Álmos Papp – Municipality of Budapest, Department of Urban Planning, Daniel Hedari - Municipality of Budapest, Climate and Environmental Affairs department
Expected Delivery Date	2025

BUD 6.1 Solution Status M12

Status Overview

Planning progress

10%									

Implementation progress

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	-Nothing yet
Which actions are currently underway?	-Nothing yet
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	-Nothing yet

Risks and Challenges

Which risks and challenges is the solution facing?	-Establishing a taskforce whose work can be meaningful long after the end of the project -Legislative barriers to establish an REC's as core elements of PCED's -A challenge might be to find/create incentives for participation -The regularly changing ownership (and/or location) of services/businesses
Do these affect other solutions? If yes, which ones and how?	-It can possibly affect SP2, the establishment or RECs.
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	-No

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Next Steps

Please briefly outline the overall next steps for this solution	-Establish a list of relevant local and national stakeholders who would form the taskforce -Begin the process of forming them into a taskforce, through workshops, joint commitments, etc.
What actions are planned for the next semester?	-Establish a list of stakeholders and contact them

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	-Not yet
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	-Community Budgeting is strong in Budapest, and we have a lot of experience in it (involvement of local citizens)
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	-Longevity of taskforce, regarding both role and viable business models

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Budapest Conclusions: M12

The involvement of the stakeholders and their contribution to identify common actions is crucial. The municipality of IV. District, Budapest waterworks and the Sewage system operator is committed to the project and interested in the cooperation.

Data collection remains a challenge, especially as we need up-to-date and accurate maps for the area. Therefore, our aim is to involve public utility companies to be partners and provide data. A positive outcome is that some utility providers (specifically Sewage system operators) are very supportive and likely to provide data. On the other hand, we need energy consumption data for residential buildings. We are partners in ATELIER, where REC and PED are the core topics, therefore we can bring the knowledge into this project and also enrich its content by linking with related projects (Reallocate).
Starting the planning phase of the refurbishment of the school building is still in front of us, we will start the procurement procedure in January 2024.
Another challenging task in front of us is to identify the PCED area and develop our plan.

Figure 2. Ex-school building to be refurbished and to be used as co-housing. Photo by Municipality of Budapest

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ASCEND

Accelerate poSitive Clean ENergy Districts

Charleroi PCED Book

Implementation status report – M12

Project: Accelerate poSitive Clean ENergy Districts
Grant Agreement No.: 101096571
Deliverable No.: D4.2 Five PCED Books
WP: 4
Date: January 22, 2024
Status: Final
Version: v1
Dissemination level: Public

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Version History

Date	Person	Action	Status	Dissemination
13.10.2023	S. Oviedo, E. Blanco	Sent for feedback	Template (Draft)	MCs, Coordination
31.10.2023	S. Oviedo, E. Blanco	Submitted to Mcs	Template (Final)	MCs
05.12.2023	P-J Fondu	Sent for review	Draft	ENC
06.12.2023	S. Oviedo, E. Blanco	Reviewed Draft, sent for peer-review	Reviewed Draft	AIT CARTIF
06.12.2023	C. Reynaud	Peer-reviewed Draft v2	Peer-Reviewed Draft (1/2)	CARTIF, ENC
13.12.2023	R. Simón de Lama	Peer-reviewed Draft v2	Peer-Reviewed Draft (2/2)	CARTIF
14.12.2023	S. Oviedo	Revised document, updated status formats	Draft for city review	MCs
22.12.2023	P-J Fondu	Sent for review	Draft v2	ENC
11.01.2024	S. Oviedo, E. Blanco	Reviewed Draft v2	Reviewed Draft v2	IGRETEC
16.01.2024	P-J Fondu	Sent for review	Draft v3	ENC
22.01.2024	S.Oviedo, E. Blanco	Edited Draft v3	Final v1	Coordination Team
20.02.2024	B. Gaiddon	Reviewed Final v1	Sent for Revision	ENC
21.02.2024	S. Oviedo	Corrected typos	Final v2	Coordination Team

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ASCEND

Table of Contents

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Charleroi Executive Summary: M12

2023 has been the first year of activity through the ASCEND project. Beyond the project start-up, the more significant steps were:

- Constitution of the internal team (collaboration between City of Charleroi and Igretec)
- Kick-off meeting in Lyon
- Harvesting workshop in June establishing starting point and priorities
- Set up of a strategic development committee for “Porte Ouest” area, including PECD deployment ambition
- Negotiation for property transfer and depollution on the Porte Ouest area
- Several requests for funding (Refurbishing of 2 energy efficient demonstration building, 4 demonstration projects concerning hydrogen, sustainable and circular building digital factory, depollution, urban agriculture and biomass valorisation)
- Launch of feasibility study for heat network supplied by industrial energy recovery
- First discussions to initiate an electricity storage project on the area
- Participation in masterplan for “Quartier du Futur” development with Belgian Defence authorities
- Exploratory development and business model definition of “District Cleantech” organisation (local development body)

Figure 1. General view “Porte Ouest” area. Masterplan Image by Studio Paola Vigano & Sweco

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Charleroi: Summary of Solutions

SP1	Digital Infrastructures and Tools for Flexible Energy Systems and PCED
CRL 1.1	Develop digital platform for Energy Community
CRL 1.2	Plan deployment of new sensors for energy, heat and water.
CRL 1.3	Explore and test digital twin to optimize energy and heating systems

SP2	Deployment of Energy Communities and Prosumers
CRL 2.1	Define governance and technical scheme for a citizen's energy community
CRL 2.2	Deploy Energy Community dealing with electricity, heating and cooling on the project area
CRL 2.3	Explore the possibility of enlarging the Energy Community beyond the project area

SP3	Energy-efficient Buildings Integrating RES, Storage and Frugal Solutions
CRL 3.1	Refurbish two buildings for high-energy performance and adaptive reuse
CRL 3.2	Start deployment of a district heating system based on industrial waste heat waste
CRL 3.3	Explore and deploy energy storage system (electricity and/or heat)

SP4	Decarbonisation of Mobility and Freight Logistics
CRL 4.1	Deploy new bike lane and extend bike infrastructure
CRL 4.2	Plan extension of public transport infrastructure
CRL 4.3	Enhance and create new green areas

SP5	Citizen-Centric Solutions and Co-creation along the Governance Chain
CRL 5.1	Engage local stakeholders through CleanTech District project

SP6	Urban Developer for PCED as an Umbrella Solution
CRL 6.1	Create a dedicated public governance body to orchestrate PECD

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1. Charleroi SP1 Solutions

CRL 1.1 – Develop digital platform for Energy Community

Solution Overview

Description	Deploy a digital platform for energy management and planning
Involved actors and their role	-IGRETEC – City of Charleroi: Coordination -Resolia : Technical support -Other technical experts, developer, operator, etc: TBD
Key Contact Person	Marine Keresztes (Igretec)
Expected Delivery Date	December 2027

CRL 1.1 Solution Status M12

Status Overview

Planning progress

10%									

Implementation progress

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	Preliminary inventory of available management system and data
Which actions are currently underway?	Constitution of a Working Group
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	The digital platform specifications definition needs for a more advanced masterplan definition of the district (buildings, final users, energy facilities, business model, etc.) Alignment of the development of a digital platform with the implementation planning of physical installations will certainly be challenging.
Do these affect other solutions? If yes, which ones and how?	Might impact SP2 (Management of energy community) and SP3 (Efficiency of high-

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	performance energy building and energy facilities)
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	No

Next Steps

Please briefly outline the overall next steps for this solution	Explore possible solution and architecture with help of technical experts
What actions are planned for the next semester?	Exploration phase in the scope of the Working Group Definition of basic specifications

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	Not yet
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	Not yet
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	Probably during the oncoming months. Scope still to be defined

CRL 1.2 – Plan deployment of new sensors for energy, heat and water

Solution Overview

Description	Plan deployment of sensors and hardware solutions for metering of energy facilities and to supply data to the digital platform
Involved actors and their role	IGRETEC – City of Charleroi: (Coordination) Resolia: Technical support Other technical experts, developer, operator, etc: TBD
Key Contact Person	Pierre-Jean Fondu (Igretec)
Expected Delivery Date	December 2027

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CRL 1.2 Solution Status M12

Status Overview

Planning progress

10%									

Implementation progress

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	Preliminary inventory of available sensors and interface
Which actions are currently underway?	Constitution of a Working Group
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	The sensor specifications definition needs for a more advanced masterplan definition of the district (buildings, final users, energy facilities, business model, etc.)
Do these affect other solutions? If yes, which ones and how?	Impact SP1.1 (Develop digital platform for Energy Community), SP2 (Management of energy community) and SP3 (Efficiency of high-performance energy building and energy facilities)
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	No

Next Steps

Please briefly outline the overall next steps for this solution	Explore possible technical solutions with help of experts
What actions are planned for the next semester?	Exploration phase in the scope of the Working Group Definition of basic specifications

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Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	Not yet
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	Not yet
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	Probably during the oncoming months. Scope still to be defined

CRL 1.3 – Explore and test digital twin to optimize energy and heating systems

Solution Overview

Description	Deploy and test digital twin of the district
Involved actors and their role	IGRETEC and City of Charleroi: Coordination Buildwise & Sirris : Technical experts, research body Other technical experts, developer, operator, etc: TBD
Key Contact Person	Marine Keresztes (Igretec)
Expected Delivery Date	December 2027

CRL 1.3 Solution Project Status M12

Status Overview

Planning progress

	20%								

Implementation progress

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	Setting up and request for funding of the "Digital RenoLab" project (dedicated to digital technologies allowing the deployment of cutting-edge equipment dedicated to energy renovation)
Which actions are currently underway?	Constitution of a Working Group

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Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	The digital twin exploration and testing is needed for a more advanced global definition of the district (buildings, final users, energy facilities, business model, etc.) Risk of negative answer for the funding request (Renolab project) – Answer expected Q1 2024
Do these affect other solutions? If yes, which ones and how?	Impact SP1.1 (Develop digital platform for Energy Community), SP2 (Management of energy community) and SP3 (Efficiency of high-performance energy building and energy facilities)
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	No

Next Steps

Please briefly outline the overall next steps for this solution	Explore possible digital solutions with help of experts
What actions are planned for the next semester?	Exploration phase in the scope of the Working Group Definition of basic specifications

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	Not yet
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	Not yet
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	Probably during the oncoming months. Scope still to be defined

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2. Charleroi SP2 Solutions

CRL 2.1 – Define governance and technical scheme for a citizen's energy community

Solution Overview	
Description	Define a governance and technical framework specifically adapted to the creation of citizens energy community including heating and electricity on the “Porte Ouest” territory.
Involved actors and their role	Igretec and Ville de Charleroi: Coordination District CleanTech: District development Resolia : Technical development CWaPE: Regional regulation Other potential members of the energy community (TDB)
Key Contact Person	Pierre-Jean Fondu (Igretec)
Expected Delivery Date	October 2026

CRL 2.1 Solution Status M12

Status Overview

Planning progress

	50%								

Implementation progress

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	Analyze of technical and economic feasibility of the deployment of a heating network on “Porte Ouest” territory (Resolia study) First evaluation of a potential legal structure in charge of the creation, operation, maintenance and expansion of the facilities (Resolia study)
Which actions are currently underway?	Constitution of a Working Group
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

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Risks and Challenges

Which risks and challenges is the solution facing?	Legal framework and regulation are not yet available in Walloon Region for heat exchange community. The functional definition of a governance solution needs for a more advanced global definition of the district (buildings, final users, energy facilities, business model, etc.)
Do these affect other solutions? If yes, which ones and how?	Impact SP2.2 (Deploy energy community), SP2.3 (Explore the possibility of enlarging the energy community) and SP3 (Efficiency of high-performance energy building and energy facilities)
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	Regional regulation for electrical energy community available since April 23

Next Steps

Please briefly outline the overall next steps for this solution	Exploration phase in the scope of the Working Group in collaboration with local stakeholders and with the help of specific experts (TBD)
What actions are planned for the next semester?	Definition of a basic framework for heat energy community

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	Not yet
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	Not yet
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	Not yet

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CRL 2.2 – Deploy Energy Community dealing with electricity, heating and cooling on the project area

Solution Overview

Description	Deploy Energy Community dealing with electricity, heating and cooling on the "Porte Ouest" area in the scope of its complete redevelopment masterplan
Involved actors and their role	Igretec and City of Charleroi: Coordination District CleanTech: District development Resolia : Technical development CWaPE: Regional regulation Other potential members of the energy community (TDB)
Key Contact Person	Pierre-Jean Fondu (Igretec)
Expected Delivery Date	December 2027

CRL 2.2 Solution Status M12

Status Overview

Planning progress

	20%								

Implementation progress

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	Analyse of technical and economic feasibility of the deployment of a heating network on "Porte Ouest" territory (Resolia study)
Which actions are currently underway?	Constitution of a Working Group
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	Legal framework and regulation are not yet available in Walloon Region for heat exchange community. The Porte Ouest redevelopment is still at its very beginning. Infrastructures need to be deployed

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	first and local actors and projects are not yet established in the area.
Do these affect other solutions? If yes, which ones and how?	Impact SP2.3 (Explore the possibility of enlarging the energy community) and SP3 (Efficiency of high-performance energy building and energy facilities)
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	Regional regulation for electrical energy community available since April 23

Next Steps

Please briefly outline the overall next steps for this solution	Exploration phase in the scope of the Working Group in collaboration with local stakeholders
What actions are planned for the next semester?	Support the future establishment of potential partners/consumers/producers/prosumers on the Porte Ouest area (i.e. Belgian Defense "Quartier du Futur")

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	Not yet
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	Not yet
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	Not yet

CRL 2.3 – Explore the possibility of enlarging the Energy Community beyond the project area

Solution Overview

Description	Explore the opportunity to connect or enlarge the future local energy community with other existing/potential communities (i.e. other economic actors or private/public buildings nearby)
Involved actors and their role	Igretec and City of Charleroi; Coordination District CleanTech : District Development Resolia : Technical development

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Key Contact Person	Pierre-Jean Fondu (Igretec)
Expected Delivery Date	December 2027

CRL 2.3 Solution Status M12

Status Overview

Planning progress

	30%							

Implementation progress

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	Analyze of technical and economic feasibility of the connection of the future "Porte Ouest" heating network with an existing network in Charleroi "Ville basse" (Resolia study)
Which actions are currently underway?	/
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	Legal framework and regulation are not yet available in Walloon Region for the heat exchange community. No economic profitability of an enlarged energy community (because of lack of energy demand/availability, lack of financial capabilities, too high installation costs, etc.)
Do these affect other solutions? If yes, which ones and how?	No
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	Regional regulation for electrical energy community available since April 23

Next Steps

Please briefly outline the overall next steps for this solution	Continuous evaluation of the extension potential of the community developed specifically for Porte Ouest area
What actions are planned for the next semester?	/

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Lessons Learned	
Are there specific lessons learned that you would like to share with your Community of Practice?	Not yet
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	Not yet
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	Not yet

3. Charleroi SP3 Solutions

CRL 3.1 – Refurbish two buildings for high-energy performance + adaptive reuse

Solution Overview	
Description	Complete refurbishment of two industrial buildings (“Vestiaires” & “Centrale”) for high energy performance. These buildings will be the basis for the CleanTech District development.
Involved actors and their role	- Igretec: Coordination and technical study - CleanTech District: Operations and business development -Walloon Region (Just Transition Fund): Funding -Duferco Belgium: Site Owner -Soresic: Future site owner
Key Contact Person	Pierre-Jean Fondu (Igretec)
Expected Delivery Date	“Vestiaires” building: Start of refurbishing April 2025 – Intermediate delivery September 2026 “Centrale” building: Start of refurbishing October 2025 – Delivery TBD

CRL 3.1 Solution Status M12

Status Overview

Planning progress

	30%							

Implementation progress

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In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	-Study of opportunity -Negotiation for transfer of property between Duferco Wallonie and Soresic -General layout proposal -Business model validation and cost estimation -Funding request (Just Transition Fund)
Which actions are currently underway?	-Waiting for Just Transition Fund request answer -First technical layout under evaluation by design office
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-Potential negative answer from Walloon Region to public funding request -Delay for site acquisition by Soresic -Delay for site depollution
Do these affect other solutions? If yes, which ones and how?	CRL 5.1 (Engage local stakeholder through CleanTech District): These two buildings will be the major starting point of the district's physical deployment.
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	Positive ongoing negotiation with building owner regarding to acquisition and depollution

Next Steps

Please briefly outline the overall next steps for this solution	Final refurbishment technical study Building acquisition Site depollution Start of permitting phase Start of refurbishing works
What actions are planned for the next semester?	Final refurbishment technical study Building acquisition

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	Not yet

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Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	Not yet
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	Exchange of experience on the energy renovation of old and large industrial buildings

CRL 3.2 – Start deployment of district heating system based on industrial heat waste

Solution Overview

Description	Design, develop and start to deploy a heating network based on waste heat produced both by existing industries and future e-methane production facilities
Involved actors and their role	-Igretec and City of Charleroi : Coordination -Resolia : Economic and technical study -CleanTech District: Area business development, consumer -Local industries: Waste heat producers -Columbus project: Waste heat producer -Belgian Defense: Potential major consumer -Walloon Region: Funding
Key Contact Person	Pierre-Jean Fondu (Igretec)
Expected Delivery Date	December 2027: First step of deployment and commissioning

CRL 3.2 Solution Status M12

Status Overview

Planning progress

	40%						

Implementation progress

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	Technical, legal and economic study of feasibility (Resolia)
Which actions are currently underway?	Finishing feasibility study
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

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Risks and Challenges

Which risks and challenges is the solution facing?	-Delay for site acquisition by Soresic -Delay for site depollution -Delay or cancellation of Belgian Defense Project (Quartier du Futur) -Delay for CleanTech District development (future consumers) -Funding issues
Do these affect other solutions? If yes, which ones and how?	Global project could be affected
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	Positive negotiation with Duferco and Belgian Defense Confirmation of the waste heat power availability

Next Steps

Please briefly outline the overall next steps for this solution	Funding research Technical study Final validation of establishment of "Quartier du Futur" project on the area and negotiation to confirm their ambition to connect the heat network.
What actions are planned for the next semester?	Funding research and request

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	Not yet
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	Not yet
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	Not yet

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CRL 3.3 – Explore and deploy energy storage system (electricity and/or heat)

Solution Overview	
Description	Explore the possibility to implement energy storage system for heat and electricity (batteries, H2, etc.). Deploy at least one solution on the Porte Ouest area.
Involved actors and their role	- Igretec and City of Charleroi (Coordination) - CleanTech District (Local development) - Ceneo (Investment) - BSTOR (Electrical storage project holder)
Key Contact Person	Pierre-Jean Fondu (Igretec)
Expected Delivery Date	December 2027

CRL 3.3 Solution Status M12

Status Overview

Planning progress

	30 %							

Implementation progress

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	-Funding request (JTF) for development of a 2,5 MW H2 production facility (electrolysis – 300 T H2 / year) in the Porte Ouest Area. The green H2 produced will be partly used by companies and industries in the area for storage purposes. -Feasibility study to deploy a 150 MW electrical battery storage facility (640000 T CO2/ year gain vs. a gas power plant): BSTOR project
Which actions are currently underway?	-Waiting for the funding request result (H2 project) -Finalizing the implementation study of the battery storage facility
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

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Risks and Challenges

Which risks and challenges is the solution facing?	Negative answer for funding request or for BSTOR project deployment
Do these affect other solutions? If yes, which ones and how?	No.
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	No

Next Steps

Please briefly outline the overall next steps for this solution	Exploration phase for other storage solutions (heat battery – Phase change materials) driven by Working Group Implement facilities
What actions are planned for the next semester?	Exploration phase for other storage solutions driven by Working Group Final decision for BSTOR project deployment

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	No
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	No
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	Not yet

4. Charleroi SP4 Solutions

CRL 4.1 – Deploy new bike lane and extend bike infrastructure

Solution Overview

Description	Create a cycling infrastructure to link important routes and establish the backbone of a new large-scale urban development.
Involved actors and their role	- Igretec (Coordination) - City of Charleroi (Bouwmeester)

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	- Charleroi Métropole (Regional development integrator)
Key Contact Person	Anne Timmermans (Igretec – Charleroi Metropole)
Expected Delivery Date	December 2027

CRL 4.1 Solution Status M12

Status Overview

Planning progress

	20%								

Implementation progress

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	-Request for funding (FEDER): Positive answer received.
Which actions are currently underway?	-Creation of a mobility Working Group
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-Delay for site depollution
Do these affect other solutions? If yes, which ones and how?	-CRL4.4 Explore possibilities of using renewable solutions for freight delivery
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	Not yet.

Next Steps

Please briefly outline the overall next steps for this solution	-Start of mobility Working Group -Definition of objectives and n infrastructures -Technical study (infrastructures) -Permitting phase
What actions are planned for the next semester?	-Start of mobility Working Group

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Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	No
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	No

CRL 4.2 – Plan extension of public transport infrastructure

Solution Overview

Description	Plan the adaptation of existing infrastructure and/or develop new link and solutions to connect effectively "Porte Ouest" area to the public transport network (new metro station, new electric/hybrid/H2 bus lines, connection to 2 train stations)
Involved actors and their role	- Igretec (Coordination) - City of Charleroi - Charleroi Métropole (Regional development integrator) - TEC Charleroi (public transport company) - SNCB (railway company)
Key Contact Person	Pierre-Jean Fondu (Igretec)
Expected Delivery Date	December 2027

CRL 4.2 Solution Status M12

Status Overview

Planning progress

10%									

Implementation progress

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	-
Which actions are currently underway?	- Creation of a mobility Working Group
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

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Risks and Challenges

Which risks and challenges is the solution facing?	Not yet.
Do these affect other solutions? If yes, which ones and how?	No.
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	Not yet.

Next Steps

Please briefly outline the overall next steps for this solution	Start of mobility Working Group : Stakeholder consultation, definition of possible solutions, launch of feasibility study
What actions are planned for the next semester?	Start of mobility Working Group

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	No
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	No
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	Not yet

CRL 4.3 – Enhance and create new green areas

Solution Overview

Description	Enhance existing and create new green areas in the Porte Ouest territory to strengthen the potential for attracting citizens (walking and meeting place, popular event organization, etc.). Regenerate the HF4 site (blast furnace shutdown) by preserving its industrial heritage and generating a positive impact on local tourism and the environment.
Involved actors and their role	- Igretec (Coordination) - City of Charleroi (Bouwmeester)

Funded by the European Union

	-Charleroi Métropole (Regional development integrator)
Key Contact Person	Pierre-Jean Fondu (Igretec)
Expected Delivery Date	December 2027

CRL 4.3 Solution Status M12

Status Overview

Planning progress

	30%							

Implementation progress

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	-Analysis of Porte Ouest landscape masterplan -Creation of a patrimony Working Group -Request for funding HF4 European Urban Initiative
Which actions are currently underway?	-Exploration, by patrimony Working Group
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-Delay for site depollution -Negative answer for funding request
Do these affect other solutions? If yes, which ones and how?	No
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	No

Next Steps

Please briefly outline the overall next steps for this solution	-Exploration phase driven by patrimony Working Group -Launch of detailed study to implement the Masterplan guidelines (park creation, renaturation, etc.)
What actions are planned for the next semester?	-Exploration phase driven by patrimony Working Group

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Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	No
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	No
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	No

5. Charleroi SP5 Solutions

CRL 5.1 – Engage local stakeholders through District CleanTech project

Solution Overview

Description	Engage companies, universities, research centres and training providers around cleantech themes to bring join a single campus environment (shared infr. and equipment).
Involved actors and their role	-Igretec and City of Charleroi: Coordination -District Cleantech: Operator - More than 25 Local Stakeholders, public organisations, research bodies, private companies (Wallonie Entreprendre, Sambrinvest, Mecatech, Greenwin, VKI, Sirris, Buildwise, ULiège, ULB, CRM Group, AGC, Carmeuse, John Cockerill, Engie, Imperam, Industeel, Thales, etc.)
Key Contact Person	Marc Vandenneste (District Cleantech)
Expected Delivery Date	October 2026

CRL 5.1 Solution Status M12

Status Overview

Planning progress

	50 %								

Implementation progress

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In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	-Partner exploration and preparation of initial projects -Funding request for 4 initial projects (VKILab, RenoLab, TransHySion, H2 electrolysis) -Finalize district business model
Which actions are currently underway?	-Discussion with stakeholders on different topics: H2 (testing, production), e-gas, depollution, sustainable and circular buildings, urban agriculture, energy storage, etc.)
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-Delays in infrastructure availability linked with depollution process ("Vestiaires" and "Centrale" buildings)
Do these affect other solutions? If yes, which ones and how?	District is the central animating element of the global project. Issues with cleantech district development could impact the entire Porte Ouest project.
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	Bring together several partners to develop the first structuring projects

Next Steps

Please briefly outline the overall next steps for this solution	-Organization of survey and co-creation workshops (including citizens and stakeholders) to upgrade roadmap definition -Ecosystem development by District Cleantech on the 4 initial projects basis -Ecosystem progressive installation in the refurbished "Vestiaire" building
What actions are planned for the next semester?	-Ecosystem development

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	No

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Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	No
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	No

6. Charleroi SP6 Solutions

CRL 6.1 – Create a dedicated public governance body to orchestrate PCED

Solution Overview

Description	A Strategic Committee (created by Igretec, City of Charleroi and Soresic, the special purpose company to acquire the land) manages the global economic and sustainable development strategy on the area. Creation of a dedicated development body (District Cleantech) to implement and to stimulate the development of new activities on the "Porte Ouest" area, including PCED implementation.
Involved actors and their role	-Igretec (Coordination) -Ville de Charleroi (Bouwmeester) -Soresic (Property management) -Cleantech District (Operator)
Key Contact Person	Marc Vandenneste (District Cleantech)
Expected Delivery Date	December 2024

CRL 6.1 Solution Status M12

Status Overview

Planning progress

		80 %		

Implementation progress

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning

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What has been concluded in the last semester?	-Creation of Strategic Committee (Ville de Charleroi, Igretec, Soresic) -Exploratory development of the District Cleantech organization with a limited team (2 people part time)
Which actions are currently underway?	-Finalization of district cleantech business model
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-Lack of stakeholder support -Lack of adherence by companies and organizations
Do these affect other solutions? If yes, which ones and how?	Development body is in charge of Cleantech District, the central animating element of the global project. Issues with Cleantech District development could impact the entire Porte Ouest project.
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	No.

Next Steps

Please briefly outline the overall next steps for this solution	-Creation of Cleantech District company -Official public launch of the cleantech project
What actions are planned for the next semester?	-Strategic Committee validation -Creation of District Cleantech company -Official public launch of the cleantech project

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	Not yet
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	Not yet

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ASCEND

Accelerate poSitive
Clean ENergy Districts

Porto PCED Book

Implementation status report – M12

Project: Accelerate poSitive Clean ENergy Districts
Grant Agreement No.: 101096571
Deliverable No.: D4.2 Five PCED Books
WP: 4
Date: January 12th, 2024
Status: Final
Version: v1
Dissemination level: Public

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Version History

Date	Person	Action	Status	Dissemination
13.10.2023	S. Oviedo, E. Blanco	Sent for feedback	Template (Draft)	MCs, Coordination
31.10.2023	S. Oviedo, E. Blanco	Submitted to Mcs	Template (Final)	MCs
06.12.2023	I. Reis, A. Sidani	Sent for review	Draft	ENC
06.12.2023	S. Oviedo, E. Blanco	First Review	Reviewed Draft	AdEPorto, APD
07.12.2023	I. Reis, A. Sidani	Edited Draft	Draft v2	ENC
08.12.2023	S. Oviedo, E. Blanco	Reviewed Draft v2, sent for peer-review	Reviewed Draft v2	AIT CARTIF
12.12.2023	L. Lorenzen	Peer-reviewed Draft v2	Peer-Reviewed Draft v2 (1/2)	CARTIF, ENC
12.12.2023	R. Simón de Lama	Peer-reviewed Draft v2	Peer-Reviewed Draft (2/2)	ENC
14.12.2023	S. Oviedo	Revised document, updated status formats	Draft for city review	MCs
26.12.2023	I. Reis	Edited draft V3	Draft V3	ENC
01.12.2023	S. Oviedo, E. Blanco	Reviewed Draft V3	Reviewed Draft v3	AdEPorto
17.01.2023	I.Reis	Edited draft V4	Draft V4	ENC
22.01.2024	S.Oviedo, E. Blanco	Edited Draft v3	Final v1	Coordination Team

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ASCEND

Table of Contents

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Porto Executive Summary: M12

During the first 12 months of ASCEND, the Porto team set the bases for the PCED to be developed in the coming years. Due to the relevance of the digital infrastructure for the operation and monitoring of the PCED, a special focus was given to SP1. In the scope of SP1, the requirements of the digital twin representing the energy community of the PCED area are being discussed. In addition to the ongoing activities regarding the digital representation of the PCED, three schools installed renewable energy capacities which went into operation during the last quarter of 2023. To enhance energy performance, audits are being carried out for public buildings within the PCED. The results will be integrated into the digital twin aimed at evaluating alternative scenarios and energy efficiency improvements, thereby supporting the city's decision making. Furthermore, to encourage the collaboration of Porto's Transition team, PCED schools and citizens, a roadmap of engagement activities was drawn up. The local team is currently discussing how to integrate alternative mobility scenarios (SP4) into the PCED digital twin. However, these discussions are still in a preliminary stage and more details on SP4 will be included in the next internal report (M18).

Figure 1. Porto's PCED location. Image from Google Earth, Edited by AdEPorto.

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Porto PCED: Summary of Solutions

SP1	Digital Infrastructures and Tools for Flexible Energy Systems and PCED
POR 1.1	Expand and define data collection and treatment protocols
POR 1.2	Plan and deploy smart metering, monitoring, and communication infrastructures
POR 1.3	Integrate energy data into Porto's Urban Data Platform and develop the PCED digital twin
POR 1.4	Deploy digital blueprint, data visualization and analysis dashboards for Energy Community

SP2	Deployment of Energy Communities and Prosumers
POR 2.1	Plan and develop a PV energy community integrating schools, housing, and municipal buildings

SP3	Energy-efficient Buildings Integrating RES, Storage and Frugal Solutions
POR 3.1	Perform energy audits in municipal and social housing buildings
POR 3.2	Monitor electricity consumption in social housing dwellings
POR 3.3	Deployment of a high energy performance building in Serralves Foundation

SP4	Decarbonisation of Mobility and Freight Logistics
	No solutions planned for SP4 at this point

SP5	Citizen-Centric Solutions and Co-creation along the Governance Chain
POR 5.1	Plan and implement citizen engagement activities

SP6	Urban Developer for PCED as an Umbrella Solution
POR 6.1	Create a PCED taskforce within Porto's Transition Team

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1. Porto SP1 Solutions

POR 1.1 – Expand and define data collection and treatment protocol

Solution Overview	
Description	Definition and listing of existing datasets, sources, and formats as well as identification of data needs. Assessment and definition of protocols for energy data collection, formatting, and processing. Rules for energy sharing among city actors are also established.
Involved actors and their role	-Associação Porto Digital (APD): Definition of protocols for data collection, management, and treatment. -AdEPorto: Identification of existing energy data sets, owners and sources.
Key Contact Person	-APD: João Bastos, Ricardo Machado and Adeeb Sidani -AdEPorto: Inês Reis, Bruno Costa, and André Silva
Expected Delivery Date	December 2023

POR 1.1 Solution Status M12

Status Overview

Planning progress

Implementation progress

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	**Planning - Implementation**
What has been concluded in the last semester?	-Listing of existing data sources, formats, and needs
Which actions are currently underway?	-Gathering of data and sharing among AdEPorto and Porto Digital -Assessment on how to include energy data in the city's urban data platform (https://udi.porto.digital/)
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

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Risks and Challenges

Which risks and challenges is the solution facing?	-Access to data which involves non-project partners – requires the presentation of the project and getting other entities on-board
Do these affect other solutions? If yes, which ones and how?	Delays in POR 1.1 (Expand and define data collection procedures and treatment protocols) may impact POR 1.3 (Integrate energy data into the Porto's Urban Data Platform and plan and develop the PCED digital twin).
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	Yes. A presentation of the project and its objectives was developed and sent to relevant data providers (MOBI.E, DOMUS SOCIAL and GO PORTO). Also, when required, physical meetings are held to provide further explanations.

Next Steps

Please briefly outline the overall next steps for this solution	-Establishment of data sharing protocols, when needed. -Assessment of data updates (new relevant datasets, better ways of accessing data, etc.)
What actions are planned for the next semester?	-Creation and structuring of energy consumption (including buildings and public lighting) and renewable production datasets.

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	Overall, data exists and is accessible. Though, sometimes city players are not completely aware of it and collaboration between several actors is required to transform data into useful products for the city.
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	No
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	No

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POR 1.2 – Plan and deploy smart metering, monitoring, and communication infrastructures

Solution Overview	
Description	Selection, and acquisition of monitoring devices (200 Shelly devices already acquired). Assessment of the existence and quality of communications infrastructure for real-time monitoring and communication. Firstly, the social housing neighborhoods in which wi-fi infrastructure already exists (Lordelo) will be equipped with monitoring devices. To test real-time monitoring, 6 devices were already installed in December 2023 and the remaining will be installed during 2024.
Involved actors and their role	-Associação Porto Digital (APD): Assessment of communications infrastructure conditions. -AdEPorto: Acquisition and installation of monitoring devices.
Key Contact Person	-APD: Ricardo Almeida, Luís Freitas and Adeeb Sidani -AdEPorto: André Silva, Diogo Borges, and Inês Reis
Expected Delivery Date	December 2024

POR 1.2 Solution Status M12

Status Overview

Planning progress

					60%				

Implementation progress

10%									

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	**Planning - Implementation**
What has been concluded in the last semester?	-Acquisition of electricity monitoring devices -Assessment: monitoring and smart metering needs -Assessment of comms. Infrastructure needs
Which actions are currently underway?	-Testing of wi-fi signal (in Lordelo social housing)

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Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-Plan for wi-fi expansion in social housing can be delayed due to public procurement processes. -After planning, civil constructions will be needed to extend the Wi-Fi infrastructure.
Do these affect other solutions? If yes, which ones and how?	Delay in POR 1.2 (Plan and deploy smart metering, monitoring, and communication infrastructures) may impact POR 3.2 (Monitor social housing dwellings). Delay in POR 1.2 (Plan and deploy smart metering, monitoring, and communication infrastructures) may impact POR 1.3 (Integrate energy data into the Porto's Urban Data Platform and plan and develop the PCED digital twin).
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	Yes. The permission to install monitoring devices and test wi-fi signals in social housing was overcome through direct contacts with Domus Social.

Next Steps

Please briefly outline the overall next steps for this solution	-Expansion of the Wi-Fi infrastructure (Since 2018, the city has installed the Porto. Free Wi-Fi with more than 200 access points distributed across the city and aims to fully cover the city in the coming years). -Installation of electricity monitoring devices in social housing.
What actions are planned for the next semester?	-Definition of a timetable to install monitoring devices according to the Plan for wi-fi expansion.

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	No
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	No

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POR 1.3 – Integrate energy data into Porto's Urban Data Platform and develop the PCED digital twin

Solution Overview

Description	Creation of the digital twin aimed at tracking, in near real-time, overall building electricity demand, renewable energy production, and street lighting consumption as well as integrating real time data on soft mobility.
Involved actors and their role	- APD: Development of the digital twin and connection with the city Urban Data Platform. -AdEPorto: 3D modelling and energy model development.
Key Contact Person	-APD: João Bastos, Ricardo Machado and Adeeb Sidani -AdEPorto: André Silva, Bruno Costa, and Inês Reis
Expected Delivery Date	December 2027

POR 1.3 Solution Status M12

Status Overview

Planning progress

Implementation progress

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	**Planning - Implementation**
What has been concluded in the last semester?	-Discussion of the goal and architecture of the digital twin -Creation of the PCED 3D model (geometric component)
Which actions are currently underway?	-Creation of the PCED 3D model (energy model)
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-Merging geometric and energy modeling with real-time data is a challenge (because data is

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	lagged: while electrical consumption data is from the previous day with a temporal discretization of 15 minutes; gas consumption data is from the last month and refers to an aggregated amount; renewable production data is accessed in real time; etc.). Also, before the coupling of real-time data and modeling, extensive model calibration is required, which may impose some difficulties due to the lack of detailed data (e.g., on building equipment, occupation, constructive solutions, etc.).
Do these affect other solutions? If yes, which ones and how?	Delay in POR 1.1 (Expand and define data collection procedures and treatment protocols) and 1.2 (Plan and deploy smart metering, monitoring, and communication infrastructures) may impact POR 1.3 (Integrate energy data into the Porto's Urban Data Platform and plan and develop the PCED digital twin).
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	To mitigate possible delays, regular meetings are being held between AdEPorto and Porto Digital to present recent achievements and discuss further steps.

Next Steps

WPlease briefly outline the overall next steps for this solution	-Conclusion of the PCED 3D and energy modeling -Calibration of PCED model -Creation of the digital twin (associate current information with objects), considering the existing datasets -Track PCED collected information (energy demand, renewable energy production, street lighting, weather data, etc.) -Share Porto's PCED data with ASCEND's KPI engine -Assess updates and create performance reports periodically
What actions are planned for the next semester?	-Energy modelling and calibration -Definition of the decision rules for the REC digital blueprint

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Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	No
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	No
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	No

POR 1.4 – Deploy digital blueprint, data visualization and analysis dashboards for Energy Community (Milestone 28)

Solution Overview

Description	As the PV installations that will produce energy for the REC will be implemented gradually, it is necessary to understand the temporal operational evolution of the Renewable Energy Community (REC) to be created. In this sense, a digital blueprint can help to visualize the operation and support decision-making regarding, for example, how energy surpluses are shared within the REC. Thus, this solution aims to create a digital blueprint to understand and visualize the energy flows in the PCED REC, allowing to draw conclusions on its performance, operation mode and business model.
Involved actors and their role	-APD: Development of the digital blueprint and online platform. -AdEPorto and Águas e Energia do Porto: Definition of the detailed decisions' flowchart defining how energy is used and shared in the REC.
Key Contact Person	- APD: João Bastos, Ricardo Machado and Adeeb Sidani -AdEPorto: Inês Reis, Rogério Rocha and Diogo Borges - Águas e Energia do Porto: Marta Simaria and Vanessa Ramos
Expected Delivery Date	June 2024

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POR 1.4 Solution Status M12

Status Overview

Planning progress

50%						

Implementation progress

20%								

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	**Planning**
What has been concluded in the last semester?	-Discussion of the digital blueprint (DB) purpose
Which actions are currently underway?	-Definition of the rules (algorithm) on how to share surplus renewable production
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-Lack of similar projects which could be used to compare the assumptions made.
Do these affect other solutions? If yes, which ones and how?	Delay in POR 1.4 (Deploy digital blueprint, data visualization and analysis dashboards for Energy Community) may impact POR 2.1 (Plan and develop a PV Energy Community integrating schools, housing, and municipal buildings).
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	Yes. While the digital blueprint is developed, the preliminary stages of licensing procedure for the PV installations were initiated (POR 2.1 - Plan and develop a PV Energy Community integrating schools, housing, and municipal buildings). Thus, when the specification of sharing rules becomes necessary in POR 2.1 (Plan and develop a PV Energy Community integrating schools, housing, and municipal buildings), the digital blueprint (POR 1.4 - Deploy digital blueprint, data visualization and analysis dashboards for Energy Community) will already be implemented, supporting decision-making.

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Next Steps

Please briefly outline the overall next steps for this solution	- Creation of the digital blueprint: Definition of decision algorithm, Implementation, and deployment of the online visualization tool -Periodic assessment of updates (e.g., new members joining, etc.) - Creation of detailed reports om REC performance and revision on decision algorithm
What actions are planned for the next semester?	- Definition of decision algorithm representing how energy flows are managed in the REC. - Implementation and deployment of the online visualization tool for digital blueprint (Milestone 28 - M18). -Integration of outcomes in PCED KPI engine.

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	No.
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	No.
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	No.

2. Porto SP2 Solutions

POR 2.1 – Plan and develop a PV energy community integrating schools, housing, and municipal buildings

Solution Overview

Description	PV-based renewable energy community integrating schools, social housing, and other municipality-owned assets (police, swimming pool, etc.). This REC will be created by aggregating several self-consumption systems.
Involved actors and their role	-AdEPorto: Elaboration of PV studies -Águas e Energia do Porto (AeEP): Launching of tendering procedures

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Key Contact Person	-AdEPorto: Inês Reis and Diogo Borges -AeEP: Marta Simaria and Vanessa Ramos
Expected Delivery Date	March 2025

POR 2.1 Solution Status M12

Status Overview

Planning progress

					70%			

Implementation progress

	30%							

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	**Implementation**
What has been concluded in the last semester?	-PV installation in schools.
Which actions are currently underway?	-Initiation of the permitting process for the REC creation.
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-Delays in the permitting procedure. -Definition of the sharing rules.
Do these affect other solutions? If yes, which ones and how?	-Deployment of REC (POR 2.1 - Plan and develop a PV Energy Community integrating schools, housing, and municipal buildings) depends on the development of the digital blueprint (POR 1.4 - Deploy digital blueprint, data visualization and analysis dashboards for Energy Community). -Delay in POR 2.1 (Plan and develop a PV Energy Community integrating schools, housing, and municipal buildings) may impact POR 1.3 (Integrate energy data into the Porto's Urban Data Platform and plan and develop the PCED digital twin). -Delay in POR 2.1 (Plan and develop a PV Energy Community integrating schools, housing, and municipal buildings) may influence the results of the Energy Poverty Index to be developed in POR 3.2 (Monitor social housing dwellings).

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Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	To minimize the risk of delay, the permitting process was started already.

Next Steps

Please briefly outline the overall next steps for this solution	-Assessment of the operating conditions of the REC, definition of the sharing rules and simulations. -Launch of the tender procedure for the PV installation in 3 social housing developments.
What actions are planned for the next semester?	-Definition of the sharing rules and development of the internal regulation.

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	No.
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	No.
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	No.

3. Porto SP3 Solutions

POR 3.1 – Perform energy audits in municipal and social housing buildings

Solution Overview

Description	Execution of energy audits of social housing dwellings and municipal buildings in the PCED to gather information for the energy model and municipality regarding buildings and equipment characteristics.
Involved actors and their role	-AdEPorto: Responsible for energy audits of social housing -AeEP: Perform energy audits of municipal facilities
Key Contact Person	-AdEPorto: Inês Reis and André Silva -AeEP: Marta Simaria and Vanessa Ramos
Expected Delivery Date	June 2024

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POR 3.1 Solution Status M12

Status Overview

Planning progress

	50%					

Implementation progress

	50%					

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	**Planning** (social housing energy audits) **Implementation** (public buildings energy audits)
What has been concluded in the last semester?	-Launch of the procedure to perform energy audits in municipal facilities. -Energy audits performed in 47 municipal facilities out of 186 across the city (6 in the PCED).
Which actions are currently underway?	-End of energy audits in municipal facilities and assessment of results -Deployment of procedure for energy audits in social housing.
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-Delays in energy auditing processes and poor outcomes.
Do these affect other solutions? If yes, which ones and how?	Poor energy auditing processes (POR 3.1) may provide insufficient insights for energy modelling (POR 1.3).
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	To avoid poor outcomes and promote standardization, especially in social housing audits, a specific template was developed and provided to experts performing audits.

Next Steps

Please briefly outline the overall next steps for this solution	-Conclusion of the ongoing energy audits in public buildings and launch the process for energy audits in social housing.
What actions are planned for the next semester?	-Energy audits of social housing and reporting (to be presented to the city). -Energy audits of the remaining municipal facilities.

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Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	No.
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	No.
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	No.

POR 3.2 – Monitor electricity consumption in social housing dwellings

Solution Overview

Description	Monitoring of electricity consumption of social housing households, through the installation of devices (Shelly 3EM and Shelly Plugs). This monitoring process is aimed at understanding consumption profiles to shape tailored energy efficiency and energy poverty mitigation strategies.
Involved actors and their role	-AdEPorto: Installation of monitoring devices and data analyzing
Key Contact Person	-AdEPorto: Inês Reis and André Silva
Expected Delivery Date	March 2027

POR 3.2 Solution Status M12

Status Overview

Planning progress

	50%								

Implementation progress

10%									

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	**Planning - Implementation**
What has been concluded in the last semester?	-First testing devices installed in Lordelo social housing district (POR 1.2 - Plan and deploy smart metering, monitoring, and communication infrastructures).

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	-Development of a survey to characterize perceptions on energy efficiency and energy poverty.
Which actions are currently underway?	-Testing of the functioning of the monitoring infrastructure.
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-Delays in implementation due to the lack of wi-fi communications. -Low acceptance of citizens to engage in monitoring.
Do these affect other solutions? If yes, which ones and how?	Delays in POR 3.2 may influence POR 1.3.
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	To avoid delays, the devices' testing is already in place. Also, to ensure participation in the testing phase, Domus Social (the municipal entity responsible for social housing) supported the recruitment of voluntary households.

Next Steps

Please briefly outline the overall next steps for this solution	-Rollout of monitoring devices and surveys.
What actions are planned for the next semester?	-Install the remaining monitoring devices, according to the expansion of wi-fi network. -Survey execution (simultaneous to devices installation). -Definition of an Energy Poverty Index, tailored to social housing.

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	Not yet.
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	Not yet.
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	Yes. Regarding the definition of the Energy Poverty Index (EPI).

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POR 3.3 – Deployment of a high energy performance building in Serralves Foundation

Solution Overview

Description	Finalization of the new museum wing, completely integrated in the park, and built according to advanced energy standards in heating/cooling, lighting, and air renovation (passive building). Renewable production is foreseen for the next years.
Involved actors and their role	- Fundação de Serralves: Project owner
Key Contact Person	- Fundação de Serralves: Tomás Silvestre and Rui Costa
Expected Delivery Date	October 2023

PRO 3.3 Solution Status M12

Status Overview

Planning progress

Implementation progress

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	**Operation.**
What has been concluded in the last semester?	-New ÁLVARO SIZA wing at Serralves Foundation concluded.
Which actions are currently underway?	-Assessment of the possibility to include energy consumption profiles of building in the PCED data platform (digital twin).
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-Data privacy issues: as Fundação Serralves is a private institution, giving access to consumption data which, by being incorporated in the city urban open data platform, will become public, may be an issue.
Do these affect other solutions? If yes, which ones and how?	-Energy data access may influence POR 1.3 (Integrate energy data into the Porto's Urban

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	Data Platform and plan and develop the PCED digital twin). -The possible implementation of PV assets may influence POR 2.1 (Plan and develop a PV Energy Community integrating schools, housing, and municipal buildings).
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	In evaluation.

Next Steps

Please briefly outline the overall next steps for this solution	-Include and consider this new building as an important piece of the PCED, alongside the initial ones.
What actions are planned for the next semester?	-Assessment of the possibility of including energy consumption profiles in the PCED data platform (digital twin). -Support for the possible installation of a PV system.

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	No.
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	No.
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	No.

4. Porto SP4 Solutions

No solutions are planned for SP4 at this point.

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5. Porto SP5 Solutions

POR 5.1 – Plan and implement citizen engagement activities

Solution Overview	
Description	Developing initiatives to build capacity of students and citizens in the PCED on energy-related topics by performing training sessions, gamification in schools, hackathons (Hackacity) and sustainability events (e.g., Bioblitz).
Involved actors and their role	-Fundação de Serralves: Bioblitz organizers -AdEPorto: Trainings in schools and "À Velocidade do Sol" initiative -Associaçao Porto Digital (APD): Hackacity and innovation activities with citizens -AeEP: Dissemination and support
Key Contact Person	-Fundação de Serralves: Beatriz Truta and Tomás Silvestre - AdEPorto: Rita Alonso and Inês Reis -APD: Joana Moreira and Adeeb Sidani -AeEP: Marta Simaria and Vanessa Ramos
Expected Delivery Date	December 2024

POR 5.1 Solution Status M12

Status Overview

Planning progress

		70%				

Implementation progress

	40%						

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	**Planning and Implementation (training in schools scheduled for December 2023 and January 2024)**
What has been concluded in the last semester?	-Definition of ASCEND communication and dissemination strategies (shared calendar of activities of all partners to identify synergies)
Which actions are currently underway?	-Energy and sustainability sessions in PCED schools (prepared presentations and activities). -Deployment of a gamification platform for schools with PV installations within and outside PCED boundaries.

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Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No

Risks and Challenges

Which risks and challenges is the solution facing?	-Engaging a significant percentage of the PCED inhabitants in dissemination activities, especially in social housing.
Do these affect other solutions? If yes, which ones and how?	Poor outcomes in POR 5.1 may influence POR 3.2 (Monitor social housing dwellings) and POR 6.1 (Create a PCED Taskforce within the Porto Transition Team).
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	Contacted school directors to perform activities with students. Established close collaboration with Domus Social to help disseminate the project among residents.

Next Steps

Please briefly outline the overall next steps for this solution	-Engagement of students: Development of a gamification platform; Development of energy and sustainability sessions; Implementation of the initiative "À velocidade do sol" with dedicated sessions in PCED schools. -Engagement of citizens: Participation in BioBlitz; Hackacity.
What actions are planned for the next semester?	- Implementation of training sessions in PCED schools (December 2023 and January 2024). -Finalization of the gamification platform for schools. -Initiative "À velocidade do sol" or "At the Speed of Sunlight" (in English) - is an initiative promoted by AdEPorto which includes the design, construction, and competition of small-scale solar powered cars by students. -Bioblitz activity - BioBlitz is a reference pedagogical and scientific event which seeks to raise awareness for sustainability. Under the scope of ASCEND, energy related activities will be drafted (e.g., giant board game with questions on energy and sustainability).
Lessons Learned	

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Are there specific lessons learned that you would like to share with your Community of Practice?	No.
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	No.
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	Yes. Support on effective measures on how to reach and motivate citizens, especially in socially housing settings, would be greatly appreciated.

6. Porto SP6 Solutions

POR 6.1 – Create a PCED taskforce within Porto's Transition Team

Solution Overview

Description	The local ASCEND team is working closely with the Porto Transition Team to reach relevant city players and engage them in PCED development. This collaboration is expected to raise city representatives' awareness and create capacity on city actors that will constitute the local taskforce on this topic.
Involved actors and their role	-ASCEND team: Promote the project and ensure implementation -Porto Transition Team: Boost synergies and knowledge sharing between city players and create a PCED taskforce
Key Contact Person	- ASCEND team: Inês Reis, Adeeb Sidani, Marta Simaria, Vanessa Ramos, Tomás Silvestre, and Rui Costa -Porto Transition Team: Daniel Freitas and Ana Rita Barros
Expected Delivery Date	December 2027

POR 6.1 Solution Status M12

Status Overview

Planning progress

80%

Implementation progress

50%

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In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning - Implementation.
What has been concluded in the last semester?	-Presentation of ASCEND to Porto's Transition Team -Articulation with the Transition Team to orchestrate the implementation of the PCED (Transition Team invited to monthly ASCEND meetings) to boost the creation of the taskforce. -Articulation with the Transition Team to find synergies with other city projects (e.g., CommuniCity, Gemini, Be.Neutral, etc.)
Which actions are currently underway?	-Discussions regarding the formal presentation to the city executive in the beginning of 2024.
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-Low involvement of city entities and low interest in participating in the city PCED taskforce.
Do these affect other solutions? If yes, which ones and how?	-Not directly. But presenting outcomes to local representatives is a project milestone, and it can hinder access to relevant data.
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	Not yet.

Next Steps

Please briefly outline the overall next steps for this solution	-Presentation of the ASCEND PCED (Milestone 23 - M12) and PCED taskforce to local representatives -Development of a replication plan
What actions are planned for the next semester?	-Presentation of the PCED to local representatives and press release (Milestone 23 - M12) -Update meetings between the Porto Transition Team and the PCED taskforce

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Porto Conclusions: M12

The mapping of actions allowed the local consortium to get an overview of the activities being performed and the ones ahead for the next months. These activities are being drafted at the same time as the city is developing its Climate Action Plan and its Climate City Contract, being directly in line with the 2030 Porto carbon neutrality ambition. Overall, the main activities are in line with the schedule. Still, digital and monitoring activities must be focused on over the next months to ensure successful implementation. Also, due to the risk of permitting procedures, the activities regarding the creation of an energy community will be strengthened. In turn, since social acceptance is crucial for the success of ASCEND, citizen engagement activities will commence in the next months to make sure the local community is engaged in the project activities which is especially important in regards of mobility solutions (SP4) and its acceptance. The outcomes of the Capacity Building program to be initiated in 2024 are expected to assist the discussion on how to include mobility data into the PCED digital twin. Therefore, the discussions about SP4 are still ongoing and a detailed description will be incorporated in the next report (M18).

Figure 1. Porto's PCED 3D representation. Image from Google SketchUp, model created by AdEPorto

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ASCEND

Accelerate poSitive Clean ENergy Districts

Prague PCED Book

Implementation status report – M12

Project: Accelerate poSitive Clean ENergy Districts
Grant Agreement No.: 101096571
Deliverable No.: D4.2 Five PCED Books
WP: 4
Date: January 25, 2024
Status: Final
Version: 01
Dissemination level: Public

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Version History

Date	Person	Action	Status	Dissemination
13.10.2023	S. Oviedo, E. Blanco	Sent for feedback	Template (Draft)	MCs, Coordination
31.10.2023	S. Oviedo, E. Blanco	Submitted to Mcs	Template (Final)	MCs
01.12.2023	J. Vanicka Civinova, D. Pevná, M. Kuzmic, T. Vácha	Sent for review	Draft	ENC
05.12.2023	S. Oviedo, E. Blanco	Reviewed Draft, sent for peer-review	Reviewed Draft	AIT CARTIF
06.12.2023	C. Reynaud	Peer-reviewed Draft v2	Peer-Reviewed Draft (1/2)	CARTIF, ENC
12.12.2023	R. Simón de Lama	Peer-reviewed Draft v2	Peer-Reviewed Draft (2/2)	CARTIF
14.12.2023	S. Oviedo	Revised document, updated status formats	Draft for city review	MCs
01.03.2024	D. Pevná	Sent for review	Draft V2	ENC
01.12.2024	S. Oviedo, E. Blanco	Reviewed Draft v2	Reviewed Draft v2	PRA, OICT
01.23.2024	J. Vanicka Civinova, D. Pevná	Sent for review	Draft v3	ENC
25.01.2024	S. Oviedo, E. Blanco	Edited Draft v3	Final v1	Coordination Team

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Table of Contents

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Prague Executive Summary: M12

This Prague PCED book is the first official document of a series of semi-annual reports related to Prague's PCED in Dolní Počernice. The list of main solutions to be examined and, possibly, replicated in the PCED from all the 6 Solution Packages of the ASCEND projects are identified in the book.

Each solution is described in detail in terms of its current stage of planning, results achieved, results or steps expected in the next semester, possible risks or challenges, and lessons learned.

As such, the ASCEND project in Prague is currently in the stage of finalising its master study (Energy master plan) on which further partial solutions will be based. Solutions from the Solution Packages 1, 4, 5, and 6 are still in the early planning phase and are expected to be expanded on in the next reports in accordance with the course of the project.

Figure 1, Aerial view and site plan with planned residential area by Archum Architekti

Main actors in Prague:

CVUT: Czech Technical University in Prague, University Centre for Energy Efficient Buildings (*PCED concept co-design; technical partner in the project*)
OICT: Operator ICT (*Innovation driver organisation, Data platform, Smart Neighbourhood concept; representing Prague in the project, project partner*)
PDS: Prague Real Estate Development Company (*integrating PCED into its planning practice, project partner);*
PSOE: Prague Renewable Energy Community (*Manages the EC development, associated partner);*
IPR: Prague Institute of Planning and Development *(stakeholder).*

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Prague PCED : Summary of Solutions

SP1	Digital Infrastructures and Tools for Flexible Energy Systems and PCED
PRA 1.1	Catalogue existing and design new extensive digital tools for building management and KPI analytics
PRA 1.2	Plan to deploy digital infrastructure: smart meters
PRA 1.3	Modify existing data visualization and analysis dashboards

SP2	Deployment of Energy Communities and Prosumers
PRA 2.1	Develop concept for Energy Community in PCED Area

SP3	Energy-efficient Buildings Integrating RES, Storage and Frugal Solutions
PRA 3.1	Plan high energy performance buildings
PRA 3.2	Develop concept for energy balance of the neighbourhood

SP4	Decarbonisation of Mobility and Freight Logistics
PRA 4.1	Plan a new bus terminal and integrated mobility solutions

SP5	Citizen-Centric Solutions and Co-creation along the Governance Chain
	No solutions are planned in SP5 at this point.

SP6	Urban Developer for PCED as an Umbrella Solution
PRA 6.1	Create Innovation team for local and community energy
PRA 6.2	Co-create replication guidelines for new and existing PRG districts

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1. Prague SP1 Solutions

PRA 1.1 – Catalogue existing and design new digital tools for building management and KPI analytics

Solution Overview	
Description	-The analysis to define smart sensors -The analysis for strategy to automatic data integration -BI tools should be developed to evaluate the district's performance
Involved actors and their role	-OICT - Energy specialist to define type and frequency of data to be collected. This would be also vital for the data analysis. -OICT – Data platform consultant to determine the requirements of data flow integration and manage the capacities of the development team -OICT – Data platform developer to create and manage API connections -OICT – Data Analyst – to create the foreseen dashboards and analytics -To be defined – entity to install and maintain the smart meters
Key Contact Person	OICT – Denisa Pevná
Expected Delivery Date	Will be aligned with delivery of the Smart Neighbourhood Concept (Est. End of 2025)

PRA 1.1 Solution Status M12

Status Overview

Planning progress

10%									

Implementation progress

0 %									

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	-Broad categories of the digital tools was confirmed -Cooperation with the urban data platform was secured -Hardware infrastructure (except the sensors) was partially agreed upon. More detailed definition of technological solutions to be defined will be delivered in approx. 6 months.
Which actions are currently underway?	-Discussion on KPIs

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Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-The PCED is yet to be built. This determines the level of detail which can be reached within the scope of ASCEND. -Selection of deployer of smart meters should align with the KPIs selection. Risk currently not clear. - The exact energy management business model will largely depend on upcoming implementation of law regarding the Energy Communities.
Do these affect other solutions? If yes, which ones and how?	No (but it is necessary for the overall evaluation)
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	No.

Next Steps

Please briefly outline the overall next steps for this solution	- KPIs discussion -Identifying the target data sets derived from abovementioned, the types of smart meters -Create the customize analytical outputs -All will be part of the Smart Neighbourhood Concept.
What actions are planned for the next semester?	-KPIs definition -Identifying the target data sets

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	-Data Platform should focus on multiple thematic categories separately mainly in terms of data collection
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	-Data Platform open-source code
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	-Evaluation of PCEDs -Good practice of Digital twins from other cities

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PRA 1.2 – Plan to deploy digital infrastructure: smart meters

Solution Overview

Description	Smart sensors will be specified for the PCED, according to required datasets linked to KPIs. So far, the meters should provide data about energy (electricity, heat) and water consumption, energy production, temperature (indoor and outdoor), humidity, solar radiation, traffic intensity measurements (cars, public transport, bicycles, pedestrians), waste management data, indoor CO2 levels. All will be included in the Smart Neighborhood Concept.
Involved actors and their role	-OICT - Energy specialist to define type and frequency of data to be evaluated. This would be also vital for the data interpretation. -To be defined – entity to install and maintain the smart meters
Key Contact Person	OICT – Denisa Pevná
Expected Delivery Date	To be defined

PRA 1.2 Solution Status M12

Status Overview

Planning progress

10%									

Implementation progress

0 %									

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	-Data sets of interest was broadly defined
Which actions are currently underway?	-Discussion on KPIs
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-The PCED is yet to be built. That represents a crucial fact and is related to all potential future risk and challenges. It is defining the level of detail of the project deliverables. -The entity responsible for the smart meters needs to be determined. This should align with

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	the KPIs selection. This risk remains partially unclear.
Do these affect other solutions? If yes, which ones and how?	Yes (the data provided via smart meters should be carefully considered for sake of high quality implementation after the part EU project scope).
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	No.

Next Steps

Please briefly outline the overall next steps for this solution	- KPIs definition -Precise definition of the data sets to be collected -Derived from abovementioned, the types of smart meters
What actions are planned for the next semester?	- KPIs definition - Identifying the target data sets

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	Not yet.
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	No
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	Types of BI relevant products (meant like e.g. dashboards for electric chargers, not generally like PowerBI)

PRA 1.3 – Modify existing data visualization and analysis dashboards

Solution Overview

Description	Exploitation of existing open-source solutions of Golemio (https://golemio.cz/) data platform and their modifications to fulfil PCED goals, including KPI analysis and overall energy balance
Involved actors and their role	-OICT - Energy specialist to contribute on specific tasks definition -OICT – Data platform consultant to contribute on specific tasks definition -OICT – Data platform data analyst to modify existing and produce new dashboards
Key Contact Person	OICT – Denisa Pevná
Expected Delivery Date	To be defined

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Project Status M12

Status Overview

Planning progress

10 %									

Implementation progress

0 %									

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	Future modification of existing passporting dashboards already deployed for use in energy community
Which actions are currently underway?	-Discussion on KPIs (1.1 is crucial and driven by KPIs, 1.2 will supplement this with some insights on future implementation of the sensors. 1.3 will showcase the future analytical solutions)
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-The PCED is yet to be built. That represents a crucial fact and implies that the exact real-world solution should be carefully considered to ensure high-quality implementation after the part EU project scope.
Do these affect other solutions? If yes, which ones and how?	-No
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	-No.

Next Steps

Please briefly outline the overall next steps for this solution	- KPIs determination - Identifying the target data sets - Facilitate the data flows - Create the customized analytical outputs - all abovementioned will be part of the Smart Neighbourhood Concept
What actions are planned for the next semester?	- KPIs determination - Identifying the target data sets

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Lessons Learned	
Are there specific lessons learned that you would like to share with your Community of Practice?	Not yet
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	No.
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	Not yet

2. Prague SP2 Solutions

PRA 2.1 – Develop concept for Energy Community in PCED Area

Solution Overview	
Description	The solution includes a conceptual framework and action plan for establishing energy sharing scheme in the PCED district. Prague has been designing and testing 3 different models for establishing energy communities. ASCEND plans to deliver concept for energy microgrid within the Dolní Počernice area for over 500 residential units.
Involved actors and their role	-CVUT: Coordination, technical validation. -PDS: Realisation. -PSOE: Consultant.
Key Contact Person	Petr Wolf (CVUT), Michal Kuzmič (CVUT), Tomáš Lukeš (PDS), Jaroslav Klusák (PSOE)
Expected Delivery Date	Input into technical specification (tender documentation) for project documentation for zoning decision: 12/2023 EC readiness concept: 12/2024 Revised EC readiness concept: 12/2027

Project Status M12

Status Overview

Planning progress

20%								

Implementation progress

0%								

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In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning.
What has been concluded in the last semester?	Conceptualisation, early-on negotiation with stakeholders.
Which actions are currently underway?	Input incorporated into the Energy Master Plan (study), 12/2023.
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-Unclear legal framework for energy communities in the country. -Competing interests of power providers vs. local sharing. -Extension of PV uncertain due to Prague regulation of green vs. PV on roofs.
Do these affect other solutions? If yes, which ones and how?	-PCED balance can be affected if not enough PV is possible due to regulations.
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	-Low awareness and mutual communication barriers were largely overcome with key stakeholders (PDS, PSOE, IPR).

Next Steps

Please briefly outline the overall next steps for this solution	-Drafting robust and cost-competitive solution for local distribution network to be incorporated into a tender for project documentation provider. -Following the legislative development connected with energy sharing.
What actions are planned for the next semester?	- Drafting of the Local Distribution Network (LDN) concept and negotiating with possible energy providers and LDN operators. - Clarifying the potential for PV installations and storage.

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	The urban planning regulations can be limiting in terms of mutually excluding green roofs with PVs. Status of biosolar roofs is not sufficiently established in regulation. This can be an issue when investor aims to maximise PV production.
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	It was discussed with the city of Utrecht (NEB-STAR). However, no blueprint has been found yet.
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	Integration of biosolar roof into urban planning regulations.

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3. Prague SP3 Solutions

PRA 3.1 – Plan high energy performance buildings

Solution Overview

Description	Energy performance standard of the 90 buildings within Dolní Počernice area will be designed to possibly reach Category A (energy certificate). The classification of the building into classes is given in the table in Annex 2 to Decree No. 264/2020 Coll., pursuant Act No. 406/2000 Coll., on energy management, as amended (Act No. 3/2020 Coll.).
Involved actors and their role	-CVUT: Technical Validation -PDS: Coordination -Prague City Hall: Financial validation, realisation.
Key Contact Person	Tomáš Matuška (CVUT), Tomáš Lukeš (PDS)
Expected Delivery Date	-Input into technical specification (tender documentation) for project documentation for zoning decision: 12/2023 -Final technical specification: 12/2025

PRA 3.1 Solution Status M12

Status Overview

Planning progress

80%		

Implementation progress

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	The minimum requirements for the parameters of the envelope were defined and the minimum efficiencies of technical systems in buildings were set.
Which actions are currently underway?	Preparation of building permit documentation.
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

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Risks and Challenges

Which risks and challenges is the solution facing?	Finding a business model for construction in high performance level.
Do these affect other solutions? If yes, which ones and how?	The energy sources (PRA 3.2) are analysed and designed for the given energy performance standard.
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	No.

Next Steps

Please briefly outline the overall next steps for this solution	Project documentation (for zoning decision) for given energy performance standard of the buildings.
What actions are planned for the next semester?	Discussion of solutions with the building construction and systems designers. Tender for project documentation for zoning decision will take place.

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	Clear targets of energy standard must be defined at early stage of the process including specifications of technical systems (incl. details as active vs passive shading).
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	No.
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	No.

PRA 3.2 – Develop concept for energy balance of the neighbourhood

Solution Overview

Description	Energy sources for Dolní Počernice residential area will be designed based on analysis of PCED (emissions, energy). Central heat source with district heating system and infrastructure for power supply and sharing. Any share of fossil fuels (likely some share of gas will remain for CHP unit, together with heat pumps/electric boilers) is planned to be balanced with RES with the aim to fulfil carbon neutrality in operation.
Involved actors and their role	- CVUT: Technical Validation - PDS: Coordination

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	-Prague City Hall: Financial validation, realisation.
Key Contact Person	Tomáš Matuška (CVUT), Tomáš Lukeš (PDS)
Expected Delivery Date	-Technical specification (tender documentation) for project documentation for zoning decision, energy part: 12/2023 -Final technical specification: 12/2025

PRA 3.2 Solution Status M12

Status Overview

Planning progress

50%					

Implementation progress

0 %									

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	Analysis of the central heat source (technical sizing, economic analysis, environmental analysis) has been performed based on 3 technologies (biomass, CHP, heat pump) combined with PV systems to meet PCED criteria (emissions, energy). Economic parameters have been defined for 15 years of operation.
Which actions are currently underway?	Discussion on completely different business model based on flexibility-to-grid based heat source offered by possible operator.
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	New business model is challenging to meet PCED KPI (electric boiler, heat pump only) and effective use of energy in general while economically viable.
Do these affect other solutions? If yes, which ones and how?	This could affect completely the design of PCED if agreed, need for more detailed analysis to check the business model from the point of PCED requirements (under which conditions).
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	Finding possible operator of the energy source on one hand, but with problematic structure of source from the point of PCED requirements.

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Next Steps

Please briefly outline the overall next steps for this solution	Analysis of "pure economical" structure of energy source suggested by a possible energy operator from the point of PCED criteria met by the district.
What actions are planned for the next semester?	Assessment of energy sources and final definition of their structure.

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	Visions and economical assessments made by the business companies operating the central energy sources are completely different from PCED priorities (energy balance + clean sources).
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	Visions to be proved by further analysis for Dolní Počernice came from Taarnby Denmark.
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	How to integrate grid flexibility-based heat source into PCED KPIs?

4. Prague SP4 Solutions

PRA 4.1 – Plan a new bus terminal and integrated mobility solutions

Solution Overview

Description	-A new BUS terminal will be developed within the catchment area of the PCED, taking into account the current mobility data and public transportation network. It will integrate micro-mobility solutions for first and last mile. -Data of the level of service (LOS) of traffic must be automatically integrated. -BI tools will be developed to evaluate the district's mobility behavior.
Involved actors and their role	-OICT – Mobility specialist to coordinate mobility aspects of the district to the strategy of the city. Also defines type and frequency of data to be gathered and evaluated. This would be also vital for the data interpretation. -OICT – Data platform consultant to determine the means of data flow integration and manage the capacities of the development team. -OICT – Data platform developer to create and manage API connections.

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	OICT – Data Analyst – to create the foreseen dashboards and analytics. To be defined – entity to build and maintain the BUS terminal; architects to design the BUS terminal; Transportation company of Prague as the operator of public transport; Regional public transportation organiser as the planner of public transportation in the district and connection to other mobility hubs.
Key Contact Person	OICT – Denisa Pevná
Expected Delivery Date	To be defined

PRA 4.1 Solution Status M12

Status Overview

Planning progress

10%									

Implementation progress

0 %									

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	-Defining transportation modes -Defining interoperability between partners and transport modes
Which actions are currently underway?	Discussion on KPIs and the architecture of the Bus terminal
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-The decision to build this terminal is a coordination of more political parties and regional politicians. -General risks are delivery in time, delivery in budget, the quality of the overall service, etc.
Do these affect other solutions? If yes, which ones and how?	-No
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	No.

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Next Steps

Please briefly outline the overall next steps for this solution	-KPIs selection -Identifying the target data sets -Create the customize analytical outputs -Start the architectural tender
What actions are planned for the next semester?	-KPIs selection -Identifying the target data sets

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	No.
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	Projects such as FCD, online position of public transport, etc.
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	Experiences on aligning political decision-making with technical aspects for mobility.

5. Prague SP5 Solutions

No solutions planned for SP5 at this point.

6. Prague SP6 Solutions

PRA 6.1 – Create Innovation team for local and community energy

Solution Overview

Description	Prague will form an Innovation Team for Local and Community energy to promote closer collaboration between municipal organizations and departments. The team should involve middle managers and practitioners who are responsible for energy related projects/agendas in their organization. The goals are (i) developing shared understanding and language related to current goals, trends and solutions related to local energy, (ii) aligning the activities of key actors in the city, clarifying roles and informing policymaking related to adoption of innovation, (iii) co-creating a common approach to building smart, clean positive energy districts and ensuring it is implemented in all key projects, and (iv) collaborating on engaging broader stakeholder ecosystem and citizens and

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	ensuring coordinated communication towards stakeholders and partners and higher project acceptance
Involved actors and their role	-OICT (Smart Prague office): Coordination -CVUT: Methodology support, key member -PDS: Founding member and co-host -PSOE: Founding member and co-host -Key municipal departments and city organizations/companies: members
Key Contact Person	OICT – Denisa Pevná
Expected Delivery Date	9/2024 – memorandum, report, and consolidated structure

PRA 6.1 Solution Status M12

Status Overview

Planning progress

40 %

Implementation progress

20 %

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	**Implementation**
What has been concluded in the last semester?	- Forming of the team -Draft of a memorandum to promote collaboration and express common interest to promote carbon neutrality -Selection of dedicated innovation manager to facilitate -Mutual learning and co-creation sessions -Joint work on the strategy for Smart PCEDs
Which actions are currently underway?	-Growing the team -Consolidating the format -Preparing final version of the memorandum
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	-The solution is a soft one, so it is challenging to frame as a distinct innovation and to formalize the impact
Do these affect other solutions? If yes, which ones and how?	-yes, it can be difficult to onboard new members and to transfer the coordination within the team

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Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	no

Next Steps

Please briefly outline the overall next steps for this solution	-Development of a cookbook for innovation teams -Co-creation of memorandum -Setting evaluation and monitoring/reporting mechanisms for the activities of the innovation team -Adopting the Smart PCED model – the goals finalise the model and to have each organization define their role in implementing it
What actions are planned for the next semester?	-the memorandum -the cookbook

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	No.
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	After we develop the cookbook and memorandum, we would be able to share those as a useful resource.
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	Lessons learned on relevant organizational models from other cities

PRA 6.2 – Co-create Replication guidelines for new and existing PRG districts

Solution Overview

Description	Collaboratively, project partners and stakeholders are engaged in co-creating replication guidelines for positive clean energy districts, fostering innovation and sustainable practices. This collective effort ensures the development of standardized guidelines (including energy standards' guidelines) that can be applied across diverse contexts, promoting the widespread establishment of environmentally conscious and energy-efficient urban areas. To reach it, we support communication platforms to find the satisfying intersection of investor- and user needs, as well

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	as available solutions that are technically and economically viable.
Involved actors and their role	-PDS: main responsibility for the project design, Property Developers and Property Designing Companies -City of Prague (Investment and Property management Department, Energy Manager) -OICT: data collecting, monitoring, Golemio tool provider -Prague Renewable Energy Community (PSOE): operating the emerging RES network -Energy providers (Pražská plynarenská, Pražská energetika, subsidiaries), Energy system operators: supplying the solution and operation services -CVUT: supporting PDS, facilitating and expert input in discussion and negotiation -Future tenants -City of Prague - District 14: owner of buildings in the vicinity, service provider (school) -Future business in the area -DPP/Prague Public Transport Company -Ropid/Regional Public Transport Operator -Czech Association of the Local Distribution Networks -Prague Water Provider Company -Road Administration Capital City of Prague -Railways Administration
Key Contact Person	Michal Kuzmič (CVUT), Jana Vanická Civínová (CVUT)
Expected Delivery Date	-Validating the Energy Master Plan (energy solutions) with PDS before tender for project documentation for zoning decision: 12/2023 -Replication guidelines for new and existing PRG districts - preparatory work: 10/2026 -Replication guidelines for new and existing PRG districts - Final specification: 12/2027

PRA 6.2 Solution Status M12

Status Overview

Planning progress

30%								

Implementation progress

0 %									

In which phase is the project? (Planning, Implementation, Operation, Evaluation)	Planning
What has been concluded in the last semester?	-Detailed stakeholder analysis.

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Which actions are currently underway?	Validating the Energy Master Plan with PDS before tender for project documentation for zoning decision.
Has the solution suffered changes in its timeline, scope, or goals? If yes, please explain.	No.

Risks and Challenges

Which risks and challenges is the solution facing?	"Take it or leave it" tenancy model, which excludes true co-creation of solutions including the tenants' needs. It may cause suboptimal use of the provided technologies by the end-users or affect their user experience.
Do these affect other solutions? If yes, which ones and how?	Yes, PRA 2.1, PRA 3.1, and PRA 3.2.
Did you successfully overcome specific challenges in the last semester? If yes, which ones and how?	No.

Next Steps

Please briefly outline the overall next steps for this solution	Engagement towards refining the energy concept (Energy Master Plan) with key stakeholders (energy providers, PDS, energy manager). Engagement with Energy Manager of Prague and relevant departments. Continuous adaptation of the energy concept based on the project documentation and overall planning process. Creating Replication guidelines for new and existing PRG districts
What actions are planned for the next semester?	Engagement towards refining the energy concept (Energy Master Plan) with key stakeholders (energy providers, PDS, energy manager).

Lessons Learned

Are there specific lessons learned that you would like to share with your Community of Practice?	No.
Are there projects, resources, or references that you found useful for this solution and would like to share with your Community of Practice?	SPARCS project, the implementation of the pre-feasibility study of PED in City of Kladno. www.sparcs.info
Are there specific aspects of this solution that you would like to receive advice or support from your Community of Practice?	Not yet.

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Prague Conclusions: M12

The Prague PCED book summarizes the status of PCED in Prague within the ASCEND project at the end of its first year. The project is currently in its preparatory phase which corresponds to the elaboration of the individual solutions. The individual solutions will be further developed in the coming months and years.

At this moment, we can highlight the district's master study related directly to the Solution Packages 2, 3, and partly also to 1 and 6 - the Energy Master Plan. The Energy Master Plan provides a detailed analysis of the district from the city-planner's perspective, enumeration of the stakeholders, and the energy analysis of various central heat sources with recommendations.

In some areas, such as SP1 or SP4, specific proposals for the solution to be used are missing, but will be elaborated in more detail, as well as the definition of specific methods in SP5 and SP6. New legislation for energy sharing is expected to be defined in the upcoming months and, therefore, updates are expected in SP2 for the next report.

Figure 2. Future PCED neighbourhood area

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D4.2 Five PCED Books: Conclusions

The exercise of preparing the first version of the PCED books for each Multiplier City allowed us to draw some intermediate learnings for the ASCEND capacity building program. Planning short and medium-term solutions and their roadmap to achieve the targets of becoming a PCED is not a task in which MC's teams are entirely at ease. Thus, the preparation of the books itself helped them to prioritise and plan key steps on their development.

Beyond that, as the solutions are usually systemic, we observed overlaps within the division of solution packages. This division leads to difficulties in positioning a solution inside a single SP. For instance, SP2, which deals with Energy Communities and Prosumers, and SP3, which deals with Energy Efficiency and Renewable Energy, have closely related solutions.

We also observed that a few solution packages seem to have a higher readiness level for implementation by the Multipliers cities. That is the case for solutions in SP1, dealing with data and digital solutions, and SP3, dealing with Energy Efficiency and Renewable Energy. The reasons are multifaceted: they present solutions that are more mature at a market level, solutions in which the MCs already have some level of experience, solutions with a clear legal framework established and solutions that do not require important investments from the local authorities.

On the other hand, SP2, SP4, SP5 and SP6 solutions are frequently less developed. SP2 solutions for Energy Communities seem to be blocked due to evolving and unclear local legal frameworks. Solutions on urban mobility (SP4) proposed by the MC were mainly not structural, presenting usually small-scale interventions in the mobility system. Co-creation approaches (SP5) are still marginal within the MC's PCED development. Regarding SP6 and the urban orchestration, MCs are going mostly toward more soft approaches, such as multi-stakeholder working groups and guidelines, instead of formalising a centralised body for facilitating the PCED development and decision-making.

These imbalances among the SPs and the challenges of establishing implementation roadmaps will be integrated at the early stages of the ASCEND capacity-building program. As the PCED books and the MCs implementation monitoring process are continuous, ASCEND MCs will have several opportunities to challenge their current plans and push further their ambitions in terms of PCED.

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