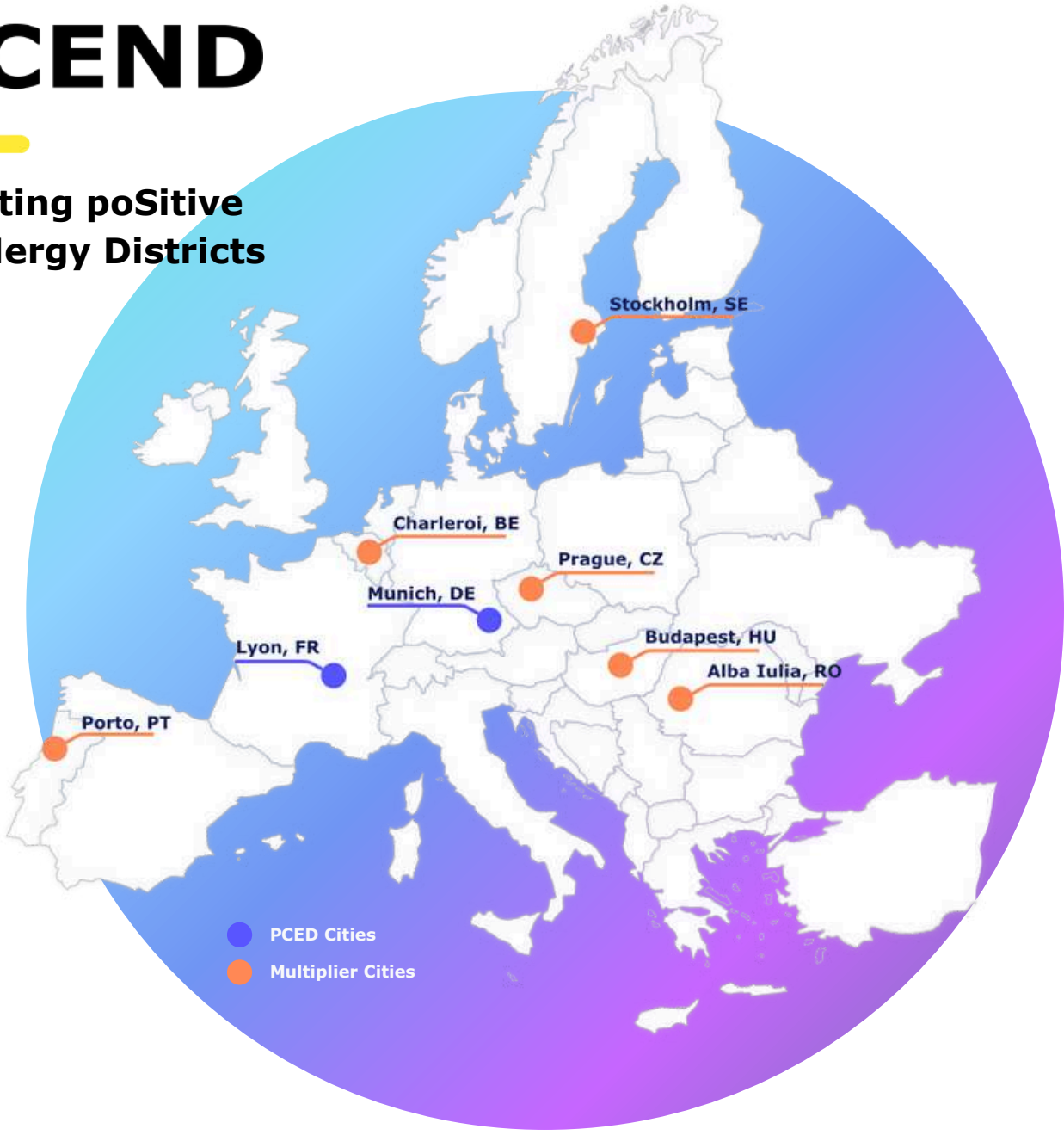
ASCEND

Accelerating poSitive Clean ENergy Districts



Landeshauptstadt München

VILLE DE LYON

Stockholms stad

PRAHA PRAGUE PRAGA PRAG

CHARLEROI

Porto.

BUDAPEST

ALBA IULIA

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Digital infrastructures and ICT tools

supporting flexible energy systems and PCEDs

SOLUTION PACKAGE 1

Cities require integrated digital solutions to efficiently manage data, energy or mobility.

In the ASCEND project, Solution Package 1 focuses on digital infrastructures & ICT tools that support the transition to climate neutrality through real-time, data-driven decision-making tailored specifically to urban systems:

- Design of the PCED with digital tools
- Use of district Energy Management Systems
- Digital monitoring through a KPI engine
- Digital infrastructure for energy communities

MUNICH

Urban Digital Twin

The Munich urban digital twin optimizes urban planning and energy efficiency through real-time 3D simulations, geodata integration, and AI-driven decision-making, ensuring smarter resource allocation and improved citizen engagement.

LYON

Confluence Monitoring System

The Confluence Monitoring System enables real-time energy tracking and monitoring by integrating GIS mapping, IoT data, and visualization dashboards, allowing better control over energy consumption and supporting sustainable urban development.

PORTO

Renewable Energy Communities

The Renewable Energy Communities digital model strengths community-driven energy sharing by using historical consumption and production data for better planning, configuration, and testing of different sharing coefficients.

CHARLEROI

Digital Energy Transformation

The digital energy platform improves energy efficiency in the CleanTech district by deploying IoT-enabled smart sensors, digital twin modeling, and BIM integration, optimizing energy use in buildings and fostering sustainable district development.

PRAGUE

Golemio Urban Data Platform

The Golemio urban data platform enhances heating efficiency, smart grid management, and urban planning by utilizing AI-powered analytics, business intelligence dashboards, and digital twin simulations to improve decision-making and energy optimization.

STOCKHOLM

Energy System Selection

Stockholm leverages its previous PED experience to exchange knowledge with ASCEND cities and assessing SP1 solutions to determine the best energy system for Loudden's transition into a PCED.

BUDAPEST

Smart Energy Planning

The GIS-based digital twin empowers data-driven urban energy decisions by leveraging scenario modeling, census data, and biomass energy mapping, enabling precise energy forecasting and better sustainability planning.

ALBA IULIA

Smart Energy Management

Alba Iulia is deploying smart energy monitoring at Dorin Pavel Technological High School to enhance energy efficiency. It is installing digital infrastructure, upgrading PV systems, integrating a Building Management Energy System, and preparing for RES-powered EV charging.

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Energy communities and prosumers

advancing clean energy transition

SOLUTION PACKAGE 2

ASCEND is driving the deployment and replication of energy communities, ensuring the creation of appropriate legal entities, new services, and innovative business models, showcasing the transformative potential of energy communities and prosumers in accelerating the clean energy transition.

MUNICH

750 kWp
PV system output

60
tenant electricity systems

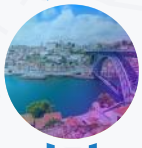
25
housing companies

LYON

200 kWh
battery systems

150
solar-powered residential homes

3€
monthly fee for 50 residents



PORTO

2nd
municipal energy community

30 %
reduction in grid demand

4
schools received a REC license

CHARLEROI

legal framework established

local energy community launched

exploring new energy sources

PRAGUE

550
residential units conceptualized

new legislation enacted

integration of LDN solutions

BUDAPEST

PCED identified

stakeholder mapping

assessment of REC scenarios

ALBA IULIA

3
buildings with PV systems

133 kWp
PV system output

42 kWp
planned expansion of the PV system output

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Refurbishment and construction
of energy-efficient buildings

SOLUTION PACKAGE 3

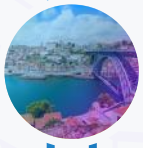
ASCEND targets refurbishment, retrofitting, and new building construction, using advanced solutions to reduce energy demand. The approach includes integrating buildings with energy storage systems and connecting them to renewable energy sources for heat and electricity generation.

MUNICH

- Prefabricated renovation system with façade and roof elements
- On-site renewable energy production with integrated photovoltaic system
- 3D digital building modelling to enable manufacturing of prefabricated components
- Focused on upgrading residential buildings to improve efficiency and comfort.

LYON

- Highly efficient construction and performance standards
- Urban integration with mixed building usage
- Performance-based plot sales meeting enviro and energy criteria



PORTO

- Over 100 energy audits completed to calibrate the PCED digital twin and identify priority retrofit interventions.
- Installation of eletrical monitoring equipments to map consuption patterns and study energy poverty.
- New Serralves Foundation Museum Wing was built to meet passive standards.
- Cross-sector collaboration with robust data collection, citizen outreach, and infrastructure upgrades

CHARLEROI

- Vestiaires and Centrale buildings undergoing complete refurbishment
- District heating powered by industrial waste heat
- Plans are underway to integrate large-scale hydrogen and electrical battery storage
- Multi-stakeholder collaboration with authorities

PRAGUE

- High-energy performance building planning for 90 buildings in Dolní Počernice
- Integrated energy balance concept for central heating and power supply has been developed
- Technical and financial coordination to ensure feasibility & alignment with the Energy Master Plan
- Procurement and tender preparations underway

BUDAPEST

- NZE Building to be adapted into 40–50 co-housing apartments
- Budapest Waterworks has developed a heat exchanger connected to the city's potable water pipeline
- By combining residential and public functions, the project promotes social innovation
- Governance collaboration among key stakeholders

ALBA IULIA

- Dorin Pavel High School Complex Refurbishment – Energy-efficient renovation of six connected buildings
- CRESCENDO Campus Construction – Romania's first net-zero dual-education campus under development
- A €14 million overhaul of the public lighting network in the PCED area reducing energy consumption
- All infrastructure upgrades are being connected to Alba Iulia's growing digital management system

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Decarbonisation of urban mobility and freight logistics

SOLUTION PACKAGE 4

ASCEND targets the decarbonisation of urban mobility and freight logistics through the creation of dedicated micromobility zones and the expansion of car-sharing and electric-vehicle networks. Additionally, rooftop PVs and new green public spaces are woven into the streetscape to improve air quality and prioritize people over cars.

Mmunich

- Operational city-wide mobility points with integrated mobility services.
- Public-private collaboration to provide mobility options.
- A dedicated website uses heatmaps and space-availability data to streamline location selection.
- The programme is city-funded until 2026, with providers paying monthly fees to access Mobility Point parking.

Lyon

- The completed Micro Hub Pilot showcased low-carbon last-mile delivery by repurposing underutilized infrastructure.
- Governance is handled by a special-purpose vehicle co-owned by Lyon Métropole and private partners.
- The Micro Hub model has been replicated in additional car parks across Lyon and in Madrid.
- Detailed hub blueprints ensure economic balance and long-term viability.

Charleroi

- Cycling Backbone will add protected bike lanes in Porte Ouest, linking into a broader supra-local cycle network.
- Charleroi is conducting feasibility studies to expand public transport connections and new modes to the Porte Ouest redevelopment zone.
- Charleroi is regenerating the former HF4 industrial site into accessible green public spaces, fostering community use and environmental restoration.

Prague

- A new bus terminal in Dolní Počernice will integrate micromobility and real-time traffic data, streamlining multimodal connections.
- Prague is building a real-time mobility analytics platform with BI dashboards, API-driven LOS data, coordinated integration with public transit operators.

Budapest

- Budapest is designing multimodal “Mobi-points”, integrating micromobility, car-sharing, and e-scooters for seamless transit connections.
- Budapest is building data-driven logistics and curbside-management frameworks to streamline last-mile delivery and cut congestion.

Alba Iulia

- Alba Iulia has nearly completed a 6 km protected bike-lane network set for full delivery by December 2025.
- Alba Iulia’s dual-mode charging network (3 public, 12 private) powers 215 EVs and cuts 110 kg CO_2 monthly, with 15 new stations incoming.
- City operates 13 e-buses, has 27 more (21 buses and 6 minibuses) on order and is planning an EV bus depot.

Stockholm

- Stockholm reached 6,700 public chargers and, through its 100-member Electrification Pact, added 800 street chargers, 50 ultra-fast stations, 17 new members, and 2 focus groups.
- STOLT is a demonstration platform using Stockholm’s Class 3 Enviro Zone to pilot reduced car travel, electrified transport, and urban greening.

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ASCEND

Citizen-centric solutions and co-creation
along the governance chain

SOLUTION PACKAGE 5

ASCEND engages citizens at every stage of urban energy governance, both through online platforms and in-person forums to build awareness, promote frugal energy habits, and secure "active citizenship" commitments that drive collective savings.

MUNICH

Munich is putting citizens at the centre of its climate strategy through the **Klimarat** (Climate Council), a participatory body that guides the city's decisions on climate protection.

The Climate Council consists of **16 members** from various stakeholder groups and provides structured input and feedback on key climate-related decisions

The Council creates value by **pooling expertise** across sectors and enhancing the legitimacy of climate actions.

A website and direct email channels help maintain **transparency** and **openness** with the public.

LYON

Lyon invited residents and local stakeholdersheld to held a **public consultation** to **co-design** the redevelopment of public spaces and shape their future urban environment.

The objective was to improve everyday **comfort**, enhance **climate adaptation**, and ensure that public spaces support **healthy, energy-positive living**.

After the consultation workshop:

- **+20%** green area (sqm)
- **+100%** increase in trees
- **+50%** increase in shrubs
- **+60%** increase in plants
- **+27%** increase in street furniture
- **- 15** decrease in parking spots

CHARLEROI

Charleroi has fully completed the planning phase for its **District CleanTech initiative.**

+50 organisations

Over 50 **local organisations** are being involved in the initiative, including investors, universities, startups, and major companies.

The initiative organises **regular exchanges** to give its members the opportunity to discover visionary projects, talk to their founders and strengthen innovation within the Cleantech ecosytem.

Integration of innovative projects is in the planning for the **refurbishment** of "La Centrale" and "Les Vestiaires" buildings.

BUDAPEST

Budapest launched a community-centred **engagement strategy** in District IV to build awareness and activate citizen participation in climate and energy initiatives.

Budapest has initiated contacts with the **Solidarity Economy Center**, an NGO already working with citizen groups interested in energy communities.

The city plans to relaunch a **sustainability consultancy service** offering one-stop access to legal and technical services.

The consultancy service will act as a **connector** between citizens and expert support on climate transition measures.

ALBA IULIA

Alba Iulia, being part of the Intelligent Cities Challenge has been working with local and international experts to develop a set of **Local Green Deals (LGD)**.

LGDs are developed in three main domains: **mobility**, **energy** and **tourism**.

The city is preparing next **Climathon** - a hackathon designed to generate fresh ideas on energy efficiency and climate resilience with students, mentors, and city representatives.

Activitites follow a **collaborative governance** instead of a commercial one. The Climathon is supported through in-kind contributions from the municipality and local university partners.

STOCKHOLM

As part of the EU NZC Pilot Cities Programme, Stockholm launched **Scale Stockholm**, an initiative focused on empowering stakeholders to take an active role in the climate transition.

At the heart of the initiative are **Local Transition Arenas**, participatory spaces serving as testbeds for solutions that can later be scaled across the city.

+100 participants

In collaboration with **Digidem Lab**, Stockholm has hosted workshops with over **100 participants** from civil society and the business community.

To address a long-standing bottleneck on how to scale successful pilots, Stockholm co-developed a **National Upscaling Guide,** embedding scale-thinking into a project design.

PORTO

Porto is participating in several events organised by local partners, such as **Roteiros com ImPacto, City Café, Bioblitz,** and **Festa do Outono** to promote the ASCEND Project.

Several **environmental and energy-awareness sessions** were held in schools across the intervention area, along with **gamified displays** linked to the photovoltaic production.

A standout strategy has been to transform **energy learning** into a dynamic experience through games and inter-school competitions that spark curiosity and engagement.

The city, together with the **Serralves Foundation**, is designing a tailor-made energy-transition program for residents in the ASCEND area to increase **energy literacy**.

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ASCEND

Urban orchestrator
Multiplier cities

SOLUTION PACKAGE 6

The Urban orchestrator is a public entity, a special-purpose body that combines elements like energy, buildings, mobility, digital tools and active citizenship in order to plan, fund and operate Positive Clean Energy Districts. The goal is to align stakeholders, operate the federating platform, de-risk projects, secure financing, and turn pilots into efficient scalable district systems.

PORTO

Mobilizing the City's stakeholders: Steps toward a local PCED task-force

- The transition team is facilitating synergies and knowledge-sharing, boosting the PCED taskforce.
- Alligned with other city projects such as A+Class, Wake Up!, CommuniCity, Gemini & Be.Neutral.
- The project was officially presented to the Municipal Executive and local partners.
- Joint actions with the Porto Climate Pact to showcase what is being promoted in the ASCEND area.

CHARLEROI

Driving sustainable development in Charleroi's Porte Ouest

- Ville de Charleroi, Igretec and Soresic formed a Strategic Committee to deliver the Porte Ouest masterplan toward carbon neutrality by 2050.
- District CleanTech - converting industrial land into a cleantech campus and fast-track PCED projects.
- An energy working group now coordinates PCED planning and infrastructure delivery.
- An innovation platform accelerates H2, CCU and energy projects
- Catalyse regional decarbonisation and attract clean-technology investment.

PRAGUE

Prague's path to sustainable urban energy: Innovation, collaboration, and replication

- Formed Innovation Teams focused on local & community energy and on environmental and climate priorities.
- Appointed a dedicated Innovation Manager.
- Co-creating replication guidelines for PCEDs to ensure efficient development.
- Identifying sustainable business models to support the construction of high-performance PCEDs.
- Validating the Energy Master Plan with PDS prior to zoning documentation tender.

BUDAPEST

Building a collaborative task force for PCED deployment

- A PCED taskforce is being planned with District IV Municipality.
- Local businesses, residents and NGOs are being identified as active participants.
- Utility companies will provide operational support.
- The aim is a sustainable, stakeholder-led taskforce for long-term governance.

STOCKHOLM

Orchestrating Change: How ElectriCITY is transforming Hammarby Sjöstad

- The eco-governance model combines integrated resource management, collaborative decision-making, and active resident participation.
- Egagement with regular face-to-face meetings, workshops, and strong partnerships.
- Everyday actions: eco-friendly heating, clothes swaps, local food markets, and study circles.
- Hammarby Sjöstad 2.0 is a bottom-up governance process that links residents, businesses, academia, and policymakers.

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ASCEND

Urban orchestrator
Lighthouse cities

SOLUTION PACKAGE 6

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LYON

Shaping tomorrow's climate-neutral cities in La Confluence

1. Governance collaboration among **SPL Lyon Confluence**, the **City of Lyon**, and **Lyon Métropole** leading the PCED.
2. SPL Lyon Confluence, a **Special-Purpose Governance Body,** has been designated as the **PCED orchestrator**.
3. **Responsibilities** include studies, land sales, public space design and construction, renewable operations, and building retrofits.
4. **Confluence Innovation Partnership** - a local council bringing together experts from academia, construction, industry, and investors.
5. Four **working groups** were established, focusing on: Energy communities, building energy performance, decarbonised mobility, green and public spaces

MUNICH

Scaling Positive Clean Energy Districts through orchestration and innovation

1. The **City of Munich** is leading the efforts to **orchestrate** and **replicate** Positive Clean Energy Districts.
2. **Partners and private owners** pilot serial retrofitting, PV façades, and replication strategies.
3. The focus has shifted from establishing a new organisational body to **defining the orchestration and replication process.**
4. New **cost-saving processes** aim to scale **serial retrofitting** from building to district level, supported by digital twins, financing models, and communication strategies.
5. **Münchner Wohnen** will retrofit one building in Harthof and construct another using a similar approach, start documentation process, and publish a short guide.

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