



+CITYXCHANGE

Limerick · Trondheim · Alba Iulia · Písek · Sestao · Smolyan · Võru

+CityxChange – Developing a Lighthouse Project for Positive Energy Districts

Sustainable Places 2019



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824260.

**The +CityxChange vision is to enable
the co-creation of the future we
want to live in**



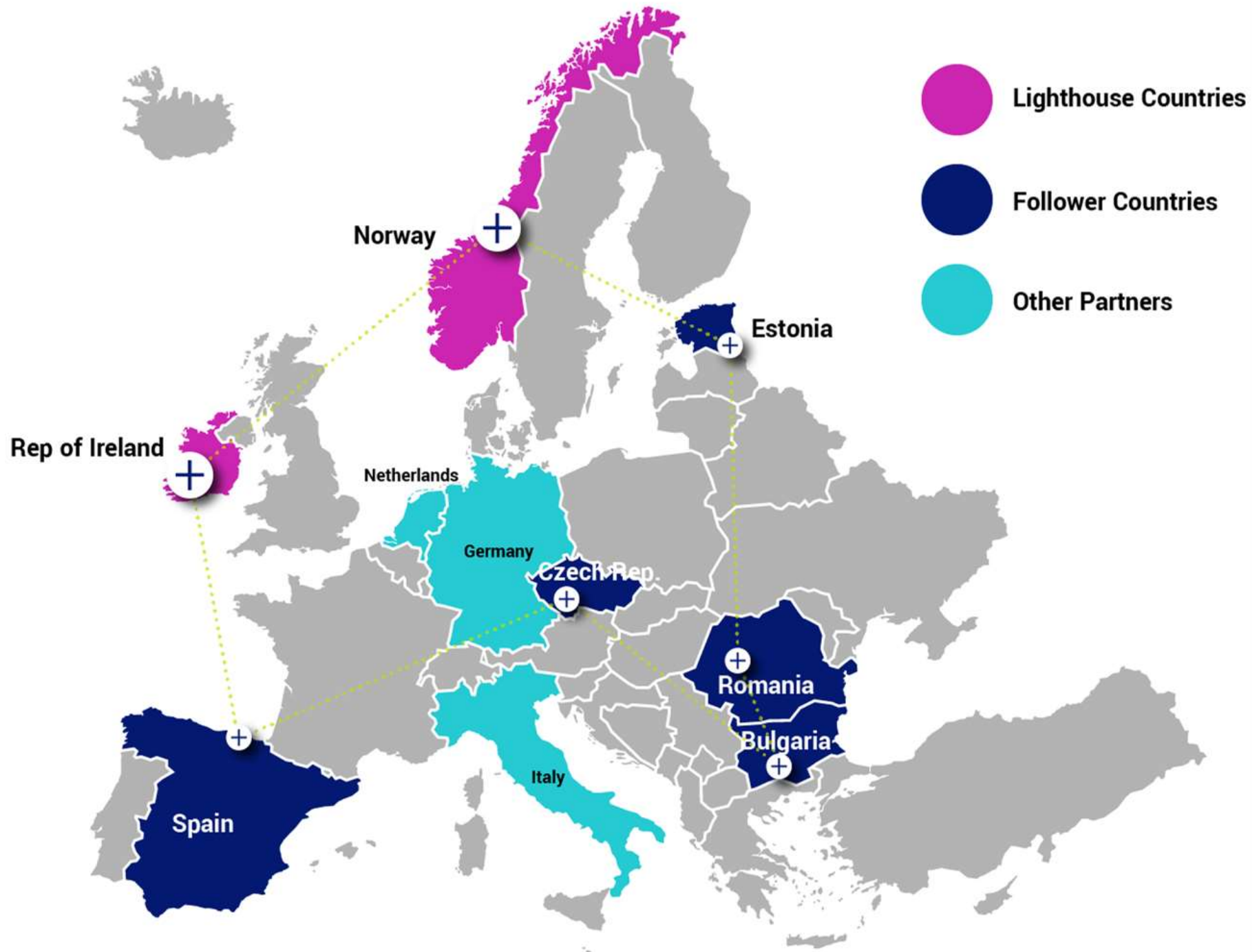
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EU H2020 SCC-01 Lighthouse Projects

The screenshot displays the SCIS website interface. At the top left is the logo for 'EU Smart Cities Information System' with the tagline 'Make your city more liveable and sustainable: Ask, learn and share about energy, ICT and mobility!'. A navigation menu includes 'Home', 'About', 'Projects', 'Lighthouse Projects', 'Technologies', 'Experiences', 'Library', 'Newsroom', and 'Login'. A search bar is located in the top right corner.

The main content area features the heading 'Smart Cities and Community Lighthouse projects'. Below this, a circular infographic shows '14 Lighthouse projects with a total of 40 lighthouse cities and 53 fellow cities'. To the right, a 'Collaborate on' section lists three categories: 'secure, affordable and clean energy', 'smart electro mobility and', and 'smart tools and services'. Below the list, it says 'Learn more about the Lighthouse Projects and their innovative solutions by clicking a project logo in the honeycomb below.' A map of Europe is shown with various colored pins (green and yellow) indicating project locations across different countries.

Cities



+CityxChange Vision

Within the **+CityxChange** project, the cities of Trondheim, Limerick, Alba Iulia, Písek, Sestao, Smolyan and Võru will experiment how to become leading cities integrating smart positive energy solutions. Through the use of **digital services**, the quality of life for and **together with the citizens** shall be improved, **more energy produced** than consumed, and **experiences with cities** across Europe exchanged to learn faster together.

The following framework supports achieving our vision:

1. Prototype the Future – Integrated Planning and Design
2. Enable the Future – Creation of a Common Energy Market
3. Accelerate the Future – CommunityxChange



Consortium Structure



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Positive Energy District

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Positive Energy Districts

Goals for Strategic Energy Technology Plan (SET Plan) Action on Smart Cities

“Enhance capacities of cities, industry and research to make Europe a global role model and market leader in technology integration for and deployment of **Positive Energy Districts** taking into account aspects of inclusiveness with the aim by 2025 to have at least **100 successful Positive Energy Districts** synergistically connected to the energy system in Europe and with a strong export of related technologies”



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Positive Energy Districts

Positive Energy Districts (PED) are mixed-use energy-efficient districts that have net zero carbon dioxide (CO₂) emissions and actively manage an annual local surplus production of renewable energy (RES). They require interaction and integration between buildings, the users and the regional energy, mobility and ICT system, while ensuring social, economic and environmental sustainability for current and future generations.



PED Programme Cities Workshop



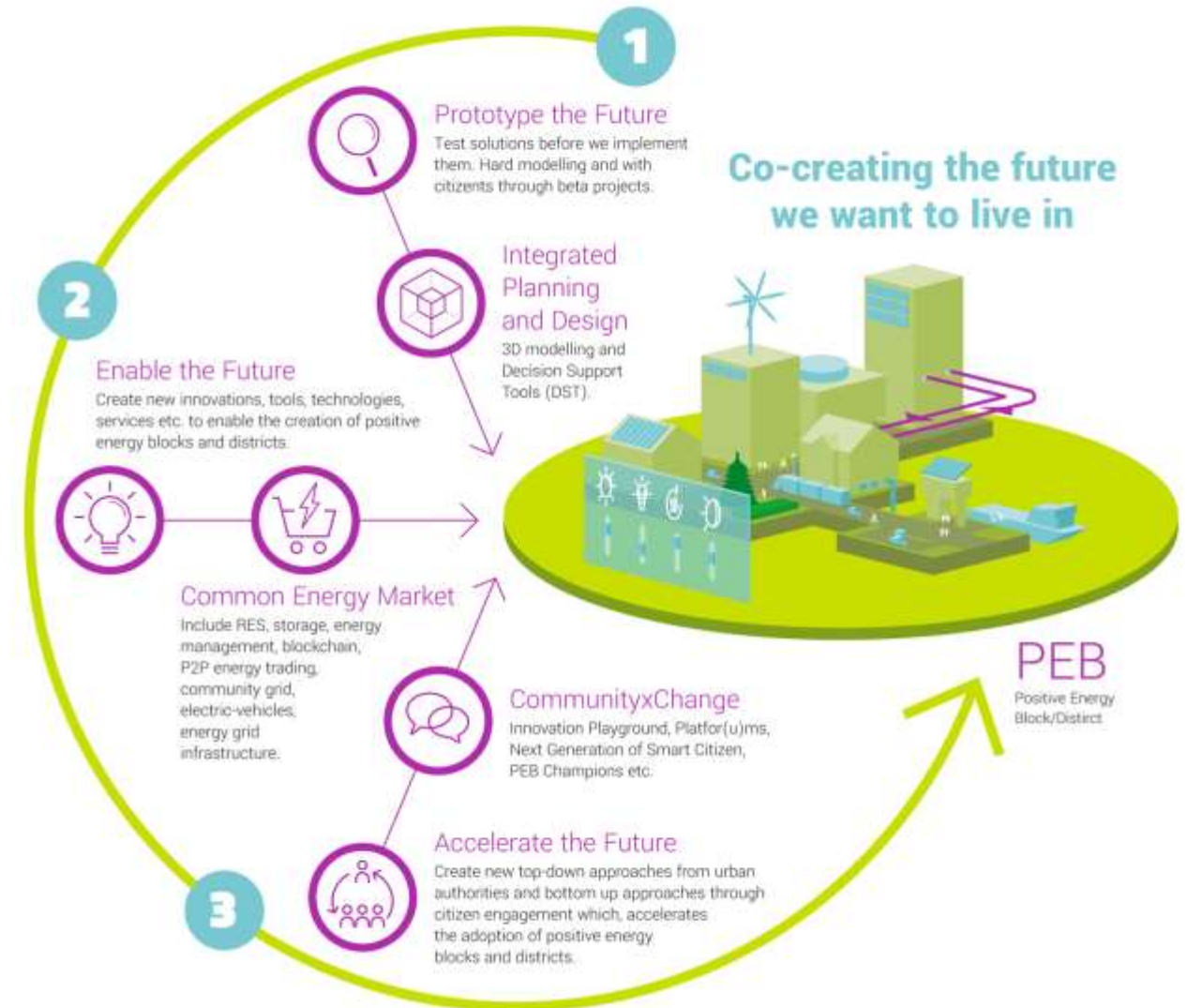
Approach

Project Core

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City-Driven System Transition towards PEBs/PEDs

- Multiple buildings (new and/or retrofitted)
- Active management of energy consumption and flow
- Annual positive energy balance
- Exchange of energy within and with the outside system
- Optimal use of RES, storage, smart grid, demand-response, user integration, ICT
- Integrated and scalable design



City-Driven System Transition towards PEBs/PEDs

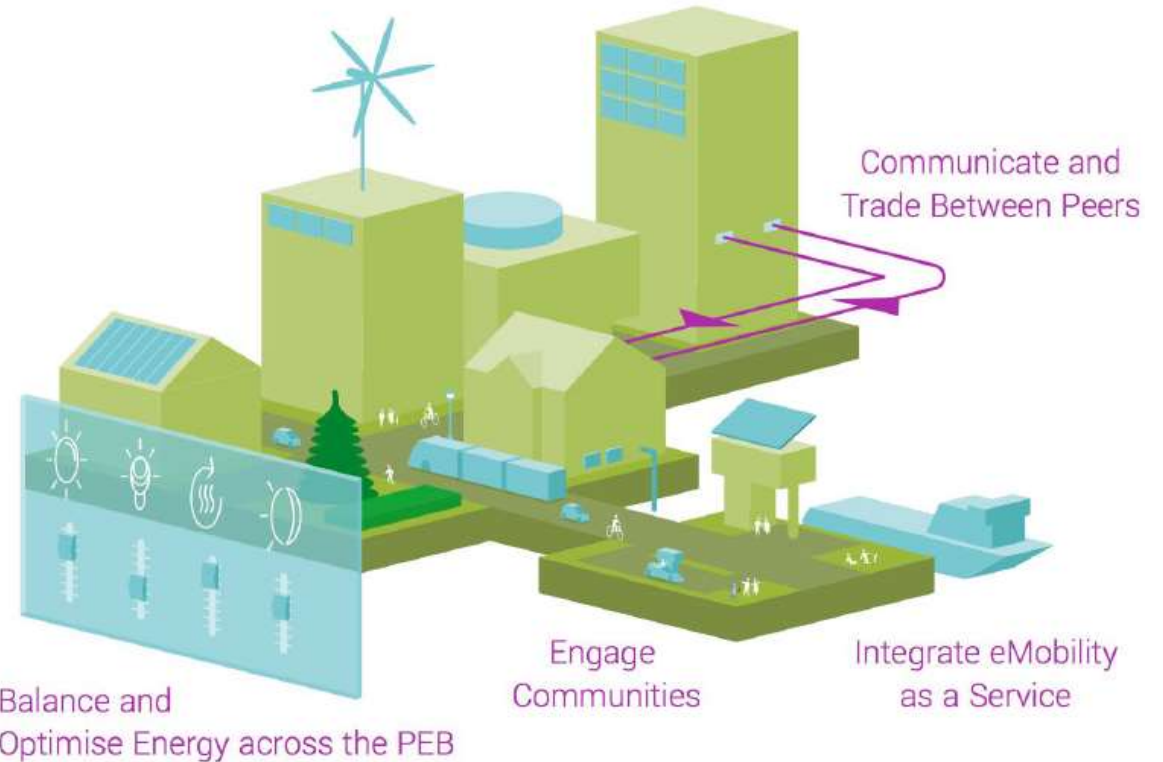
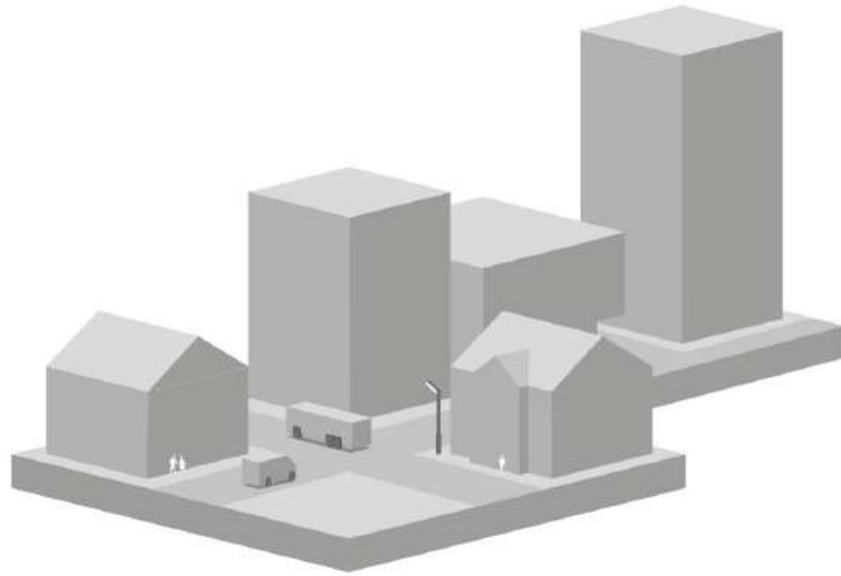
Existing Building Stock



Accelerating the Clean Energy Transition



Positive Energy Block/District (PEB)



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City-Driven System Transition towards PEBs/PEDs

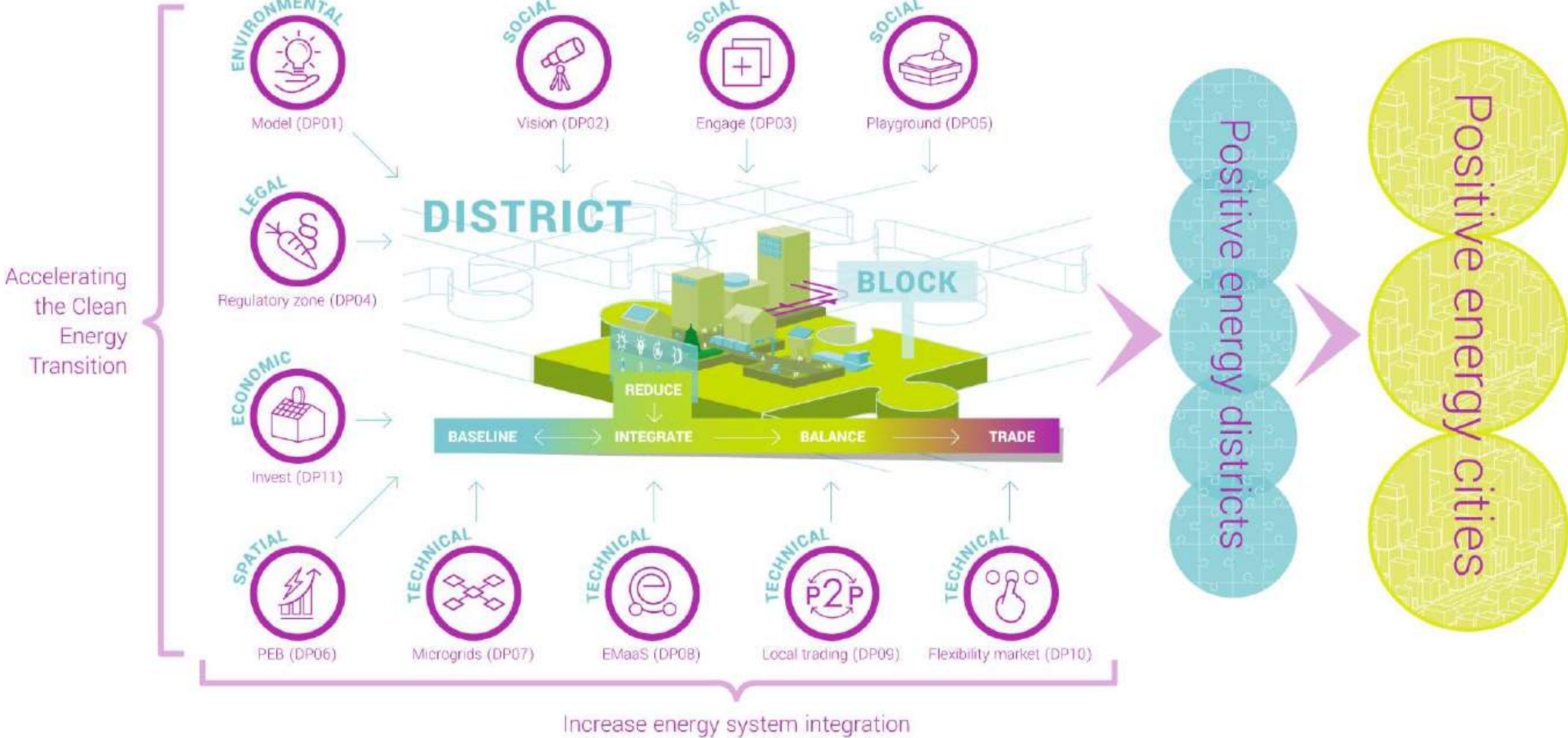
- Involve national **regulatory** bodies actively in the development of new enabling regulatory mechanisms for distributing energy systems;
- **Reduce** total primary energy demand through a variety of mechanisms from simple energy conservation measures to cutting edge energy management systems. Renovation is key, using a stepped approach ensuring practicality and affordability of the solution, which will lead to the delivery of (Near) Zero Energy Buildings;
- Create supply using distributed Renewable Energy Systems (RES) within the geographical boundary of the block as well as through **local energy sources** adjacent to the block, while still remaining within the overall district. Adjacent energy sources should be scalable to eventually service the district;



City-Driven System Transition towards PEBs/PEDs

- **Actively manage** energy across the block and in synchronisation with the requirements of the **wider energy system**. This will be achieved through the integration of **smart energy grids as well as local energy storage**. Active management will allow for balancing and optimisation, peak shaving, load shifting, demand response and reduced curtailment of RES, and district-level self-consumption;
- Facilitate **increased EV** charging capability within the district and ensure that the impact of EVs on the distribution will be minimised by using local generation where possible;
- **Trade energy** within the block and trade flexibility locally utilising advanced Distributed Ledger Technology to create added value and **incentives for the consumer** to generate energy locally, provide flexibility and aggregate power generation in a system-wide cloud solution. The aggregation of these local energy, flexibility, power quality and balancing markets will lead the way towards maximum uptake of renewables and a near zero energy economy in the future.

Scaling out





EXPECTED IMPACT

Over the entire project period

Common Energy Market



EXPECTED IMPACT

Over the entire project period



CommunityxChange



LET'S BE
positive today:)



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