

# Facts about granted EUDP Project: Flexible Citizen Energy Communities for Increased Renewable Energy FLEX-CEC

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In the green transition with more sustainable cities and buildings, there is a need for connecting local citizens, smart buildings, and renewable energy sources intelligently to the local electricity grid. Meanwhile, the new roles of Citizen Energy Communities (CEC) and Aggregators have been introduced in the energy market because of the European Union's Renewable Energy Directive aiming at increased green energy and greater inclusion of citizens. Together with technology and know-how, these drivers can accelerate the green transition of the local energy markets, which is why a group of dedicated stakeholders, organizations, and market participants have grouped up to collaborate and investigate the new opportunities.

## The Project

The project goes under the name FLEX-CEC and aims at unfolding the potential of Citizen Energy Communities (CEC) in Denmark and harness flexibility (FLEX) from the CEC participating citizens and businesses with flexible energy production and consumption. To do so, the CEC will be connected to the wholesale energy market through digital technologies and by close collaboration with balance responsible parties (BRP). The project consists of three distinct pilots, each with its own characteristics in terms of governance, participants, and energy setup. The research and development activities on technical and market aspects feed into three pilots carrying out the following:

### Demo site 1: Copenhagen Nordhavn – CECs driven by a platform company

In Nordhavn, a city under fast development, our ambition is to organize assets such as solar PV facilities, grid connected batteries, heat pumps, or cooling equipment and the consumption of regular residents and relevant owners' associations into a CEC. In the first part of the demo, this CEC will provide BRP flexibility by aggregating small assets. In the second part of the demo, the CEC will expand the scope, and provide potential DSO supporting grid services such as power quality stabilization for which a market is not yet defined.

### Demo site 2: Copenhagen Nordvest – CECs driven by a municipality

Based in the existing city of Copenhagen, the plan is to implement and test the FLEX-CEC platform in "Nordvest kvarteret". The Municipality of Copenhagen is in dialogue with a school, a housing cooperative, and private properties. The buildings are primarily installed with solar panels with the possibility for further expansion of solar panels. There are already discussions for further expansion, and the Municipality of Copenhagen has been in contact with residents in the area regarding energy communities. Furthermore, we will focus on analyzing the privacy aspects of the CECs, as well as explore how this aspect can be implemented.

### Demo site 3: Kolding and Fredericia – CECs driven by a utility company

A CEC will be established in the area around Kolding and Fredericia, which is driven and organized by the utility and energy company EWII A/S. Here the focus will be on how the CEC concept can improve the business

case for the members' or the communities' investment in RE production and storage and explore how energy companies can take a facilitating role of a CEC.

### **Project vision**

All three pilots will help introduce the CEC as a new role in the energy market with new democratic governance and direct participation of citizens and businesses. Thus, the aim of the project will also be to unlock energy flexibility from the CEC, and to create incentives for the private investment in decentralized RE production by empowering citizens with novel all-digital tools and simple user interfaces. This will allow them to contribute to the realization of a carbon-neutral energy system by increasing the penetration of renewables.

## **Partners and Roles**

### **Project lead**

The project will be led by Enyday, a climate tech startup and a frontrunner in supplying energy community solutions, supported by DTU Electrical Engineering, a key player in research in energy systems at all levels.

### **Partners**

Other partners are EWII A/S (a large utility and energy company), By & Havn (City development and liaison to local participants), EnergiDanmark (a leading company in electricity trading in northern Europe), as balance, responsible party Energi Danmark buy and sell electricity on all market horizons towards the power exchanges and the TSOs. Municipality of Copenhagen (facilitator of Energy Communities bridging private sector and municipally-owned assets) and PowerLabDK (provision of experimental data infrastructure via the platform EnergyDataDK).

## **Project approach**

Through the deployment of two cycles of demonstrations in the three pilots, the consortium will recruit members and facilitate the formation of CEC's. In addition, we will integrate cutting-edge research in collaborative game theory and look at the use of technology, user interfaces, etc., in organizational contexts. We can therefore ensure to demonstrate different variations and aspects of CECs together with local citizens, businesses, utilities, and the public sector.

## **Project funding and duration**

The project, FLEX-CEC, is a two year project, starting September 1, 2021. The project is supported by the Danish EUDP programme under grant 64021-1090.

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