

Theme: **Energy communities in the center of EU energy transition**

Introduction

Community-driven energy projects have been part of the European energy landscape since their inception in the early 20th century. The recent growth of decentralized renewable energy technologies has made direct participation in energy production and management more accessible. The participation of citizens and energy communities as partners in energy projects will play a significant role to achieve a successful transformation of the interconnected energy system. Community energy initiatives are offering new opportunities for citizens to get actively involved in energy matters. Community energy refers to collective energy actions that foster citizens' participation across the energy system. It has received increased attention in recent years, developing a wide range of practices to manage community energy projects.

The European Commission's Clean Energy for All Europeans Package confirms the prominent role prosumers and their collective forms will play in the future energy system. The EU legislative framework formally acknowledges and defines specific types of community energy as 'renewable energy communities' and 'citizen energy communities'. These new concepts open the way for new types of energy initiatives aiming at, in particular, the empowerment of smaller actors in the energy market as well as an increased decentral renewable energy production and consumption.

Who is behind this initiative?

For more than 120 years, Pražská energetika, a.s. (PRE), has been a stable partner in the energy sector. PRE and its subsidiaries form a prosperous corporate group whose mission is to ensure the reliable supply, generation and sales of energy and related services in Prague as well as in the entire Czech Republic. PRE Group consists of more than ten companies. In their activities, all of the companies follow strict ethical standards, which primarily include a responsible attitude towards society, the environment and their own employees. In its business activities, PRE proudly embraces the principles of sustainable development and through its activities, it strives to contribute to the improvement of the standards of living in the region it operates in.

What is the waste challenge:

There are a lot of open questions concerning energy communities. To bring the idea to life means assessing the topic from various angles such as legal perspective, technical design and economic evaluation. The high level framework is given by the EU on one hand and the need to implement the solution in different environments on the other lays down opportunity to create new market design and links between market participants.

- What are the differences between “Citizen energy community” (CEC) and “Renewable energy community” (REC) from legal, technical and socio-economical point of view? What are the benefits of each variant?
- How should be CEC and REC designed to fit in current EU energy market design? Is current market design sufficient for CEC / REC? What is going to be different?
- Do you see CEC / REC as integral part of future proof market design?
- Design CEC using real site conditions (RES providing energy to block of flats, family houses or combination of both)
 - Find optimal RES installed power / power production to cover CEC needs (consider energy storage)
 - Calculate energy flows among CEC members during whole year to cover intraday and seasonal discrepancies
 - Design methodology how to share locally produced energy to CEC members including energy provided from storage and from the grid (calculate 15 minute measurement interval).

- Design invoicing settlement methodology based on current electricity bill structure.
- Provide condition for CEC to operate in terms of EU framework.
- What are the main benefits and risks for CEC members?
- Based on your country's national energy mix, try to quantify, and determine the final environmental impact of your proposed CEC operation and implementation methodology. Determination of the expected value of carbon dioxide savings (saving conventional energy fuels).

Relevant considerations for the challenge / theme:

Clean Energy Package (CEP) provides new perspectives and introduces new players into electricity market design. The scope of this project is based on the CEP framework.

Despite the fact that CEP defined two types of energy communities, REC is to be considered only as a supplement, main focus of this theme is on CEC.

The outcome of this theme is rather practical based on real-world data and measurements. CEC It is advised to focus on specific conditions in one country.

Relevant links:

<https://publications.jrc.ec.europa.eu/repository/handle/JRC119433>

<https://enercommunities.eu/>

<https://www.ceer.eu/report-on-energy-communities>

https://energy.ec.europa.eu/index_en

https://extranet.acer.europa.eu/en/Electricity/CLEAN_ENERGY_PACKAGE/Pages/Default.aspx