

The background is a satellite-style image of Europe at night, with city lights visible. Overlaid on this are numerous glowing blue lines that represent energy transmission routes. These lines are curved and interconnected, forming a complex network across the continent.

Study on flexibility options to support decarbonization in the Energy Community:

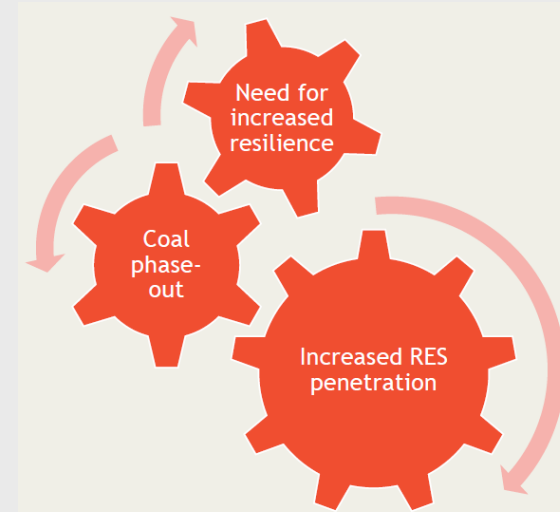
Arben Killokoqi, Energy Community Secretariat
50th ECRB meeting, Athens, 30 Nov 2021

Objective of the study:

- Identify and analyse technical and non-technical sources of flexibility in CPs'
- Evaluate their existing and future potential in different scenarios
- Formulate recommendations on flexibility sources and associated legal, regulatory and institutional framework in each CP for enabling their deployment and use according to the most cost-optimal scenarios.

Scope of the modelling:

- Each CP will be separately assessed
- Neighbouring markets will be taken into account in modelling
- Wide range of flexibility sources and non-technical measures
- 2030 and 2040 time horizons



Consultants:

Trinomics



Artelys

OPTIMIZATION SOLUTIONS

Project timeline

5 tasks + 3 workshops

1. Analyse flexibility sources (*close to being completed: T1 report delivered to CPs*)
2. Evaluate existing flex sources
3. Evaluate flex potential and future needs
4. Recommendation optimal set of solutions
5. Improve legal, regulatory and institutional frameworks

Tasks involve modelling on different scenarios and exchange of data with CP/TSOs

Stakeholders: CPs, NRA, TSOs, associations

- *Workshops in January and March 2022 (first already completed 16 Nov)*
- **Final report expected in April/May 2022**

Sources:

- Technical: flex assets and operational flexibility
- Non-technical: policy and measures that incentivise efficient use of technical flex sources

Selected in the assessment:

1. **Supply-side:** gas fired plants (OCGT and CCGT); system-friendly RES
2. **Storage:** batteries and CAES; hydro reservoir and pumped
3. **Conversion:** electrolysers
4. **Demand-side:** industrial, residential and commercial DSR
5. **Transversal:** transmission & distribution network, interconnector; electricity market

Input parameters

- Installed capacities for RES, nuclear, hydropower, etc.
- Electricity demand
- Catalogue of investment options
 - Electricity interconnectors
 - Flexible generation assets
 - Storage assets (e.g. batteries, pumped-hydro storage, CAES)
 - Conversion assets (electrolysers) if relevant
- Security of supply constraint
- Technical and economic characteristics
- CO₂ price and commodity prices

Computation



Objective

Jointly optimise investments and operations for a given scenario using an hourly time resolution

Key results

- Optimal portfolio of flexibility solutions and associated costs
 - Per Contracting Party
 - In 2030 and 2040
 - For 3 RES levels
 - For 2 integration approaches (for the moderate and high RES deployment levels)
- Operational management of the power system (hourly dispatch, CO₂ emissions, curtailment, etc.)



The background is a dark blue image of the Earth from space, showing the outlines of continents. Overlaid on the Earth are numerous glowing blue lines that form a complex network, representing energy connections or data flow. The lines are bright and have a slight glow, creating a sense of dynamic energy.

Thank you!

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