

Replicability potential of flexible Multi-Energy Systems (MES)

What does the method assess?

The method shows **where MES solutions can be applied in other regions**. It evaluates whether energy systems developed in the **SENERGY NETS project** could work in areas with similar conditions.

It also estimates how replicated systems could **increase flexibility in electricity grids**, supporting renewable integration and decarbonisation.

The assessment considers:

- Climate and environmental conditions
- Population density and energy demand
- Local resources (e.g., biomass, solar potential, waste heat)
- Existing district heating and cooling networks (DHC)
- Technology compatibility (e.g., heat pumps, CHP, thermal storage)

How does the method work?

The method compares each demonstrator system with potential locations across Europe.



Geographical screening

Identifies suitable regions at NUTS-3 level using geographical indicators

Technical matching

Examines DHC networks and compares technology mixes and energy production shares

Site selection and flexibility estimation

Filters suitable regions and uses demonstrator load profiles to estimate potential grid flexibility at national or European scale

What does the method need?

Geographical data

Climate, population density, biomass availability, solar irradiation

Technical data

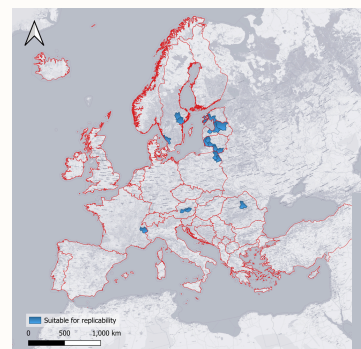
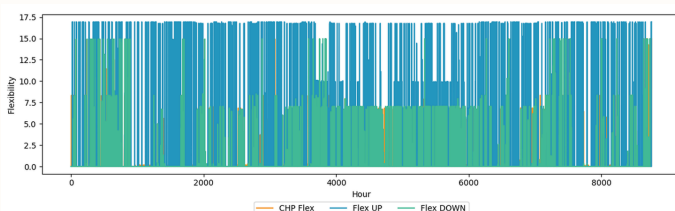
On district heating networks (technology mix, fuel shares, energy production)

Skills/expertise

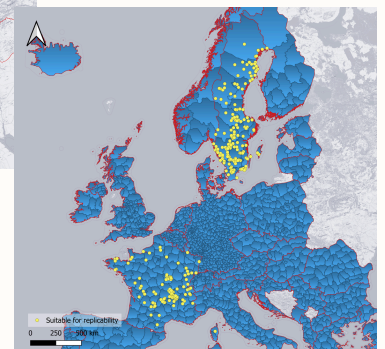
GIS analysis, energy system modelling, data processing, statistical analysis

Key model output

- Maps** showing where MES solutions could be replicated in Europe (NUTS-3 level)
- Lists** of compatible district heating and cooling networks
- Flexibility curves** estimating potential grid support



Symbolic maps illustrating the potential replication of flexible Multi-Energy System (MES) solutions across European regions (EIFER)



Aggregated Flexibility at French Country Level in GWh for Replication of Swedish Case Study Scenario (EIFER)

Developed by: EIFER; Used in: Europe

Explore more!



Curious about other models and data we work with in the Cities TCP? Explore more fact sheets via this link!

