



# FlexSUS

Flexibility for Smart Urban Systems

“ *FlexSUS supports city planners and decision-makers in their cities' sustainable transition towards climate neutrality* ”

**FlexSUS gears municipalities towards reaching their sustainability goals and EU's desire for Positive Energy Districts in developing a decision support platform that represents the local energy systems within the city's urban infrastructures.**

FlexSUS develops a decision support platform that represents through Geographic Information System (GIS) mapping the local energy systems in two Danish municipalities, Lyngby-Taarbæk and Holbæk.

The platform integrates regulatory challenges into energy planning and a large array of socio-economic parameters to account for multiple energy consumption behaviours and needs at the household level. We bring Artificial intelligence (AI), big data and energy system modelling into the decision tool. The platform is a combination of existing models, with new developed tools exploiting novel methods and algorithms.

The platform allows city planners to visualize the impact that the implementation of different decarbonization scenarios would have on CO<sub>2</sub> emissions reduction, on cost of implementation and on the end-users.

Overall, FlexSUS platform is unique as it is based on novel data-driven methods and AI algorithms targeting a holistic integrated energy system developed together with four universities and two municipalities. This makes the developed solution adaptable and scalable to multiple city strategies and constraints.

## Project Duration

01-09-2019 - 31-08-2022

## Project Budget

Total Budget: € 1,654,406

Funding: € 1,0506,245

## Project Coordinator

Claire Bergaentzlé (Denmark)

## Project Partners

- DTU Management Engineering (Denmark)
- Chalmers University (Sweden)
- Linköping University (Sweden)
- Rotterdam School of Management (Netherlands)
- Lyngby-Taarbæk Kommune (Denmark)
- Hollbæk Kommune (Denmark)

## Project Website

<https://flexsus.org/>

## Contact

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## ERA-Net Smart Energy Systems



This project has received funding in the framework of the joint programming initiative ERA-Net Smart Energy Systems. The initiative has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreements no. 646039 and no. 755970.

## ERA-Net Smart Energy Systems Joint Call 2018

This project has been awarded funding within the ERA-Net SES Joint Call 2018 for transnational research, development and demonstration projects. EUR 33.4 Mio of funding have been granted to 23 projects from 16 regions and countries.

## Main Objectives

FlexSUS develops an open source decision support platform that represents through Geographic Information System (GIS) mapping the local energy systems in two Danish municipalities, Lyngby-Taarbæk and Holbæk.

- Create a collection of modeling tools based on the FlexSUS partners' experience tailored to partners' requirements.
- Create inventories of cities' energy infrastructure and existing solutions to streamline their data collection and storage processes.
- Quantify CO2 emissions reduction and cost impact of transition scenarios based on modeling of local energy systems.
- Identify existing regulatory obstacles to the implementation of sustainable energy solutions.
- Offer concrete recommendations on the adjustment of regional and local regulatory frameworks and on micro-targeting campaign at the district level.

## Expected Main Results

- GIS-based decision support tool for city planners utilizing big Data, Data Lake and Cloud Computing.
- User-friendly front-end interface as a web application allowing the city planners to use it without installation
- Adaptable solution. The chosen methodologies allow for including all type of energy data to the data lake and tailor the solution.

When FlexSUS decision support platform is ready, city planners will be able to plan and design low-carbon energy pathways and communicate them clearly to decision-makers at the local and national levels and the public.

## Joint Programming for Flourishing Innovation from Local and Regional Trials towards a Transnational Knowledge Community

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