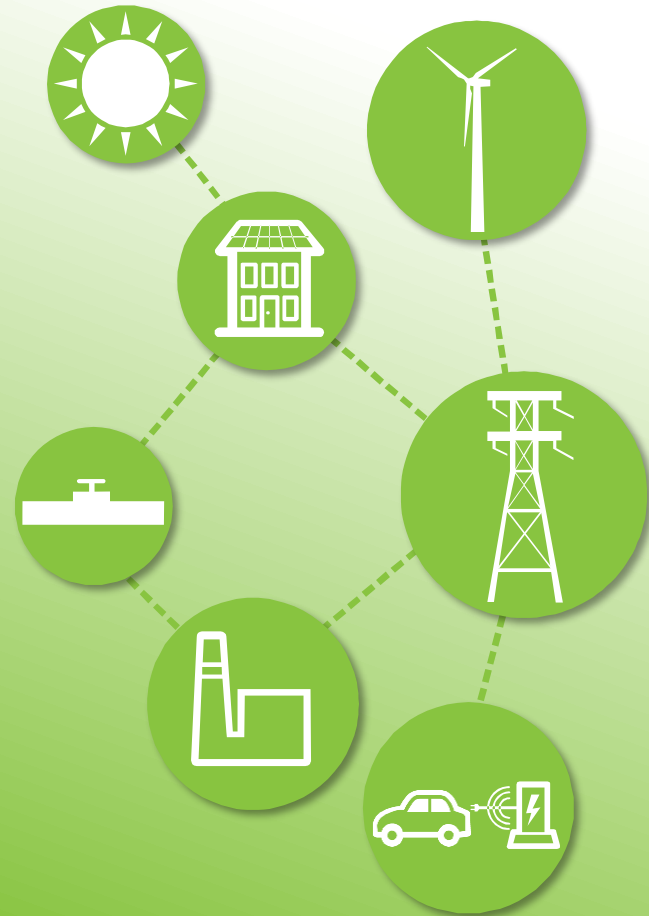




SpineOpt: A flexible energy system modelling framework in Julia

**Erik Delarue, Topi Rasku, Jody Dillon and
Maren Ihlemann**

7 September 2021



Why models?

- Energy system in transition
 - Both a complex and dynamic system
 - Precludes direct experimentation
- Need “maps” or models
 - To understand mechanisms at work in the system
 - To identify what processes are important
 - To evaluate the outcomes of interest

Some trends and challenges

- Energy system in transition
 - Increasing shares of renewables
 - Integrated energy systems
 - Including various carriers and networks (e.g., electricity, gas/molecules, heat, CO₂), conversions (e.g., P-to-X) and as such new types of flexibility providers, ...
 - Consumers taking up more active role

- Modeling features and capabilities
 - Models fit for integrated energy systems
 - Model consolidation, transparency, reproducibility, data access
 - Model adaptability and computational efforts
 - Leveraging available data, solving problems at scale (European system, full year,..), considering uncertainty, ...

Spine project



- **SPINE - Open source toolbox for modelling integrated energy systems**
 - Main objectives:
 - Build open-source tools to help modelers manage data and workflow for models working at various scales across energy systems
 - Build a flexible open-source model for integrated energy systems
 - Showcase these tools and model via a number of case studies
 - Project funded under the European Union's Horizon 2020 research and innovation programme under grant agreement N. 774629
 - October 2017 – September 2021



Spine Webinars

SpineOpt

A flexible energy system modelling framework in Julia

7 Sep, 2021,
14:00-15:30 CEST

Spine Toolbox

Data, workflow and scenario management for modelling

8 Sep, 2021,
17:00-18:30 CEST

Case Studies

Demonstration of Spine modelling tools through selected case studies

9 Sep, 2021,
14:00-16:00 CEST

SpineInterface

Quickly and easily creating new optimization models in Julia

10 Sep, 2021,
14:00-15:30 CEST

In collaboration with



JP on Energy System
Integration

In collaboration with



Register via http://www.spine-model.org/spine_webinar.htm#2
Recordings will be available afterwards

SpineOpt Webinar

- Some housekeeping
 - Webinar is being recorded and made available afterwards
 - All your webcams are off and microphones are muted
 - Questions can be raised during the presentations in the chat
 - Dependent on the question, these will be answered in the chat, or alternatively, during the Q&A afterwards
 - During Q&A, you can “raise your hand”, then we will unmute you to raise your question, or alternatively, you can use the chat

- Presenters: Maren Ihlemann (KU Leuven), Topi Rasku (VTT), Jody Dillon (Energy Reform)



www.spine-model.org

<https://github.com/Spine-project>



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N. 774629.