SpineOpt: A flexible energy system modelling framework in Julia

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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, CO$_2$), 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 - **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

[http://www.spine-model.org/](http://www.spine-model.org/)
[https://github.com/Spine-project](https://github.com/Spine-project)
## Spine Webinars

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<td>A flexible energy system modelling framework in Julia</td>
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Register via [http://www.spine-model.org/spine_webinar.htm#2](http://www.spine-model.org/spine_webinar.htm#2)
Recordings will be available afterwards

In collaboration with:
- EERA
- JP on Energy System Integration
- GLOBAL PST CONSORTIUM

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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)
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