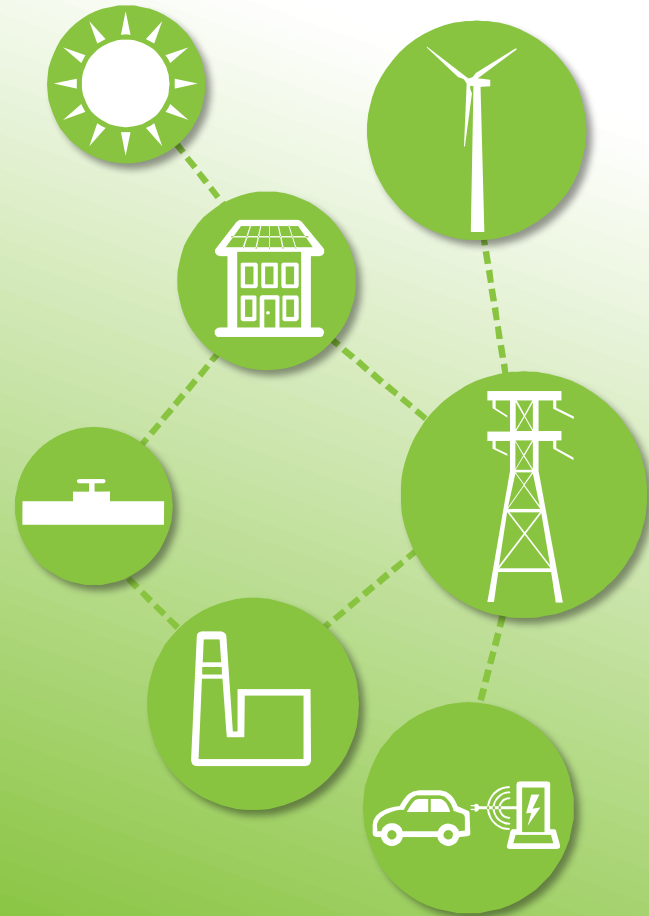




# SpineOpt: A flexible energy system modelling framework in Julia

Erik Delarue, Topi Rasku, Jody Dillon and  
Maren Ihlemann

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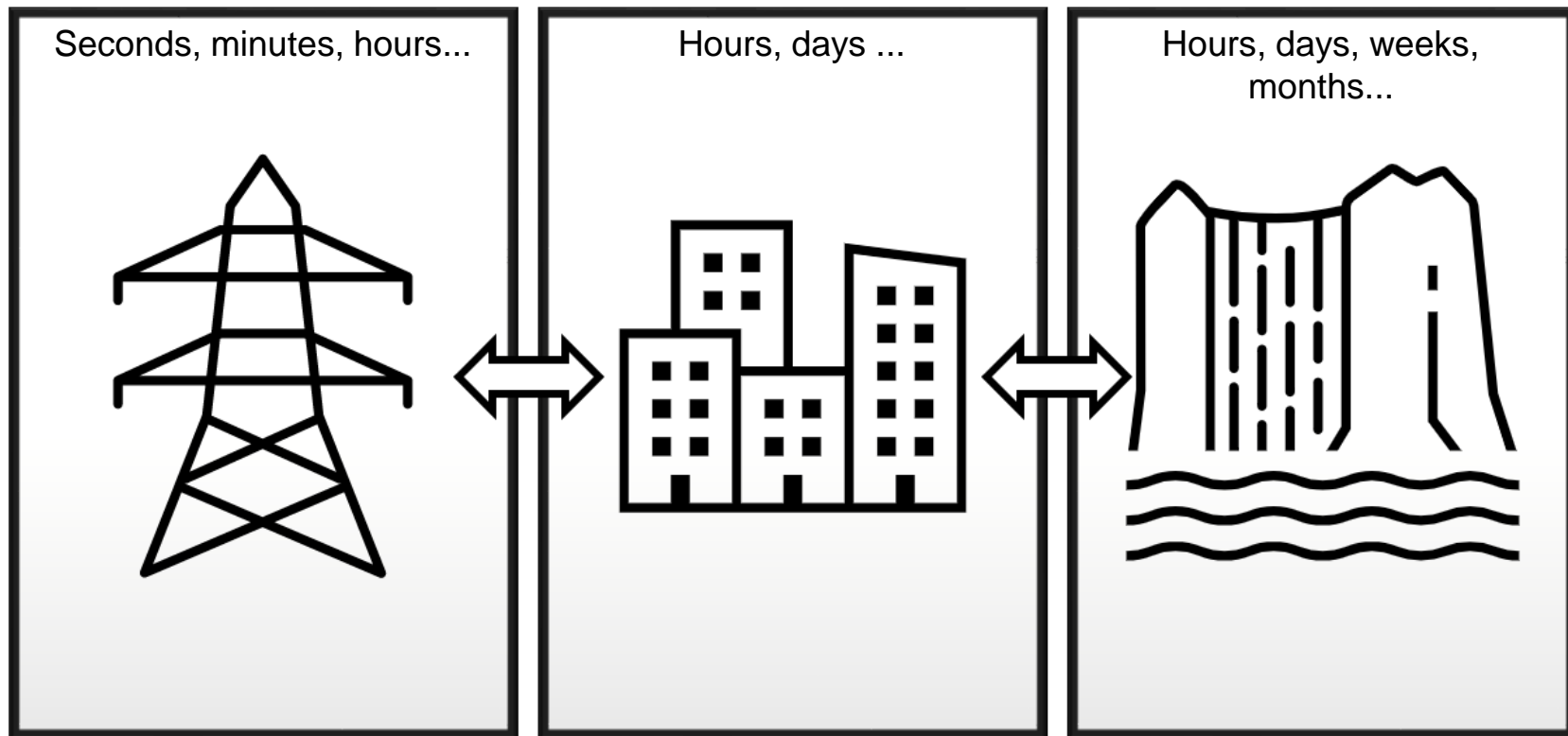


# Agenda

- Motivation & Key features of SpineOpt
- Basics of SpineOpt (~20', Maren Ihlemann)
  - SpineOpt building blocks
  - Live Demo
- **Flexible temporal structure (~10', Topi Rasku)**
- *Break*
- Flexible stochastic structure (~10', Topi Rasku)
- Representation of different energy sectors (10', Jody Dillon)
- Accommodating increased detail and complexity (10', Jody Dillon)
- Q&A

## Flexible temporal structure - Motivation

- Energy sector integration creates new interactions between systems traditionally operated on different time-scales.

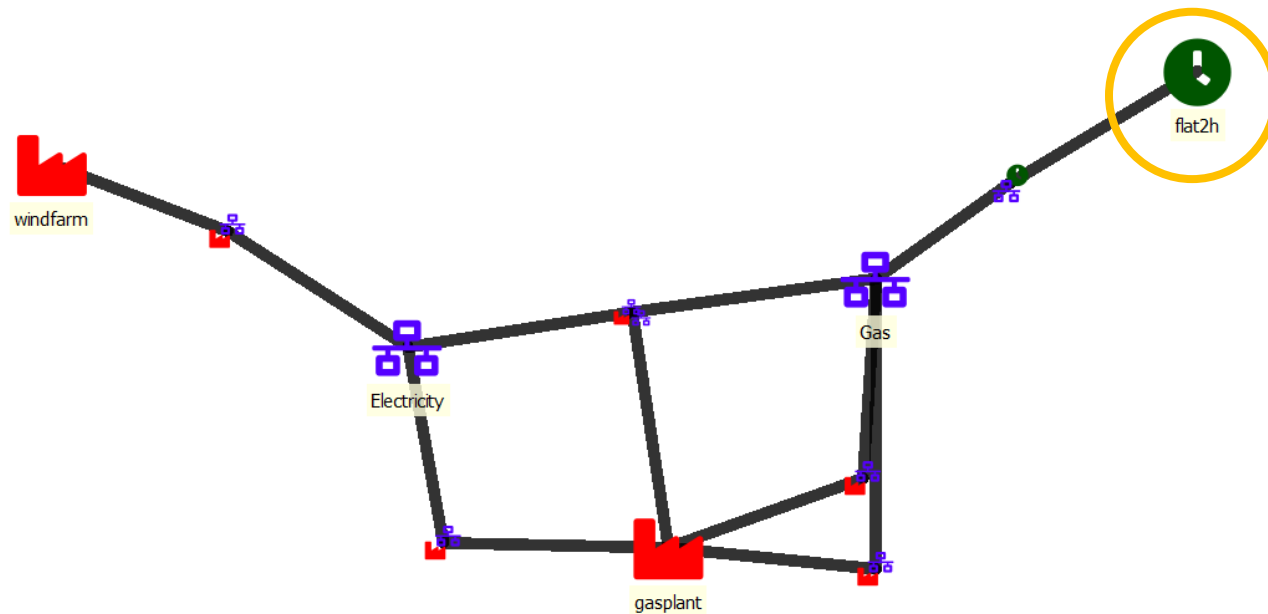


## Flexible temporal structure – Basic idea

- The SpineOpt temporal structure supports varying time resolution around the modelled system.
- The *temporal block* object represents a period of time with a defined *start*, *end*, and *time resolution*.
- The *temporal blocks* are then connected to the *nodes* and *units* to define time for each part the modelled system.

# Live demo: Different time resolution?

1. A new *temporal block* with a different resolution.
2. Connect the new *temporal block* to the system.
3. Run the model and see what changes!



# Break?

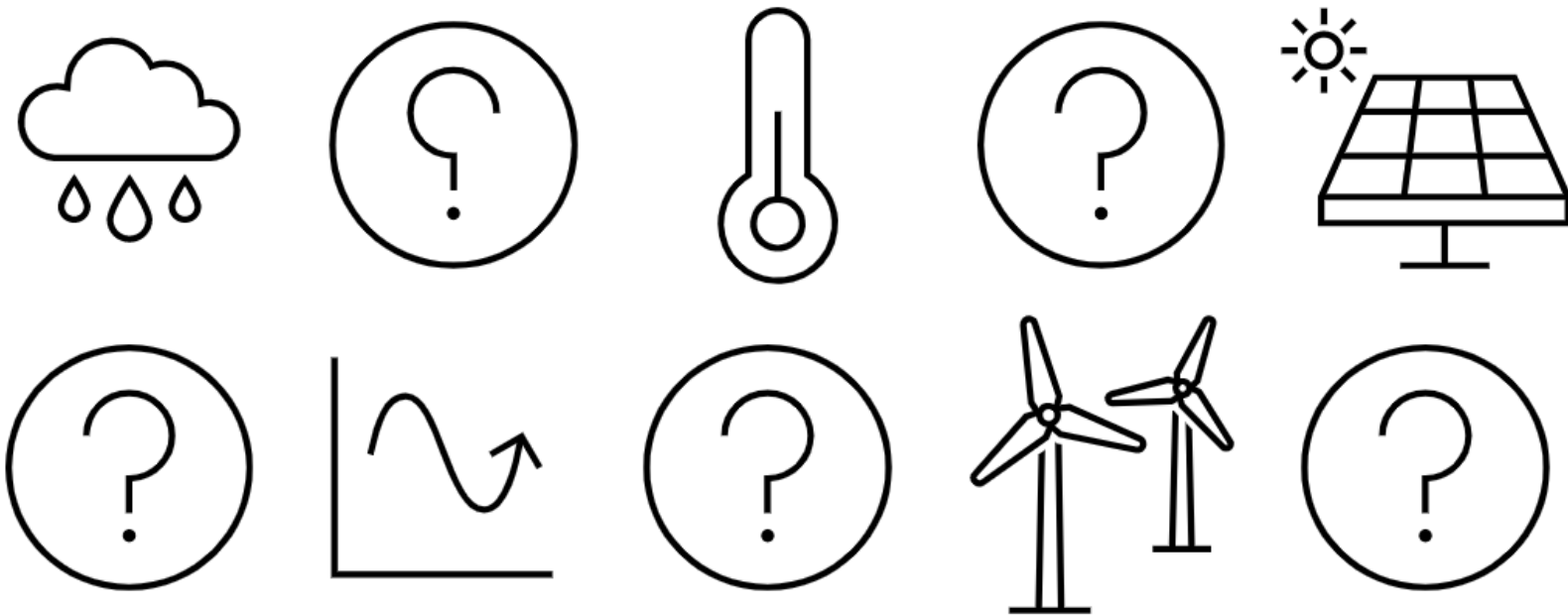
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- **Break! (~5')**
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## Flexible stochastic structure – Motivation

- **Increasing amounts of variable renewable energy generation requires stochastics!**
- However, other parts of the system aren't necessarily subject to uncertainty, or lack meaningful stochastic data.





## Flexible stochastic structure – Basic idea

- The *stochastic structure* object acts as a handle for any number of *stochastic scenario* objects forming the desired scenario tree.
- Similar to *temporal blocks* the *stochastic structure* objects are then connected to the desired *nodes* and *units* in the modelled system to define how stochastics work at different parts of the system.

# Live demo: Two different stochastic structures?

1. A new *stochastic structure*.
2. Connect the new *stochastic structure* to the system.
3. Run the model and see what changes!

