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# Modeling a 100% Renewable Electricity System

Arild Helseth, SINTEF Energi

Technology for a better society





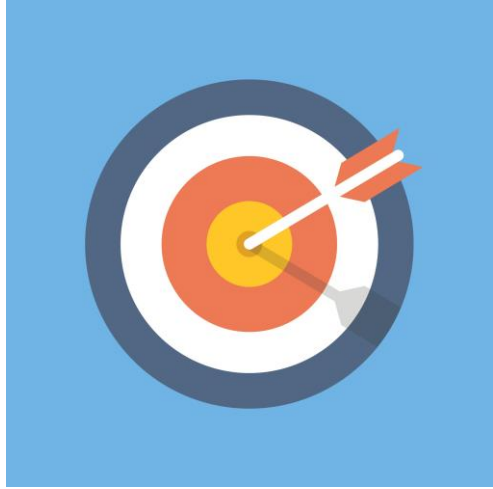
# RES100 – Modeling a 100% Renewable Electricity System

- Knowledge building project (KSP) 2024-2027
- 18 MNOK, research council supports 78 %, industry 22%





# Project Goal



Provide new insight into the power market modeling needs and knowledge about possible patterns for dispatch and price formation in the Nordic region in a 100% renewable European electricity system.

**Statnett**

**Langsiktig markedsanalyse**  
Norge, Norden og Europa 2022-2050

**LANGSIKTIG KRAFTMARKEDSANALYSE 2023**

Energjomstillingen – en balansegang

**Statkraft** 2023

**Low Emissions Scenario**





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# Knowledge Needs

1. Represent of new technologies on both the supply and demand side in power market models to better understand the future power system operation and price formation.
2. Understand the effect of increasing short-term flexibility and uncertainty on water values and operational patterns for the hydropower system.
3. Creating and validating scenarios that are consistent for energy system expansion and power market models for a 100% renewable electricity system.



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# New Technologies?

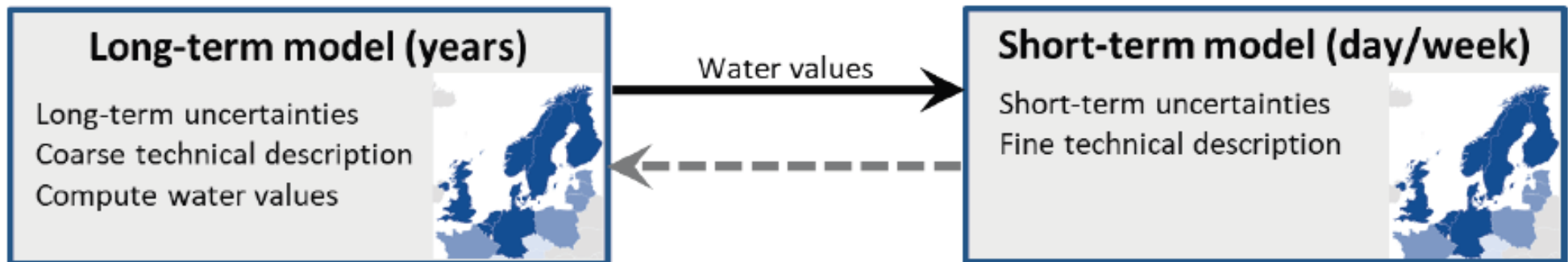
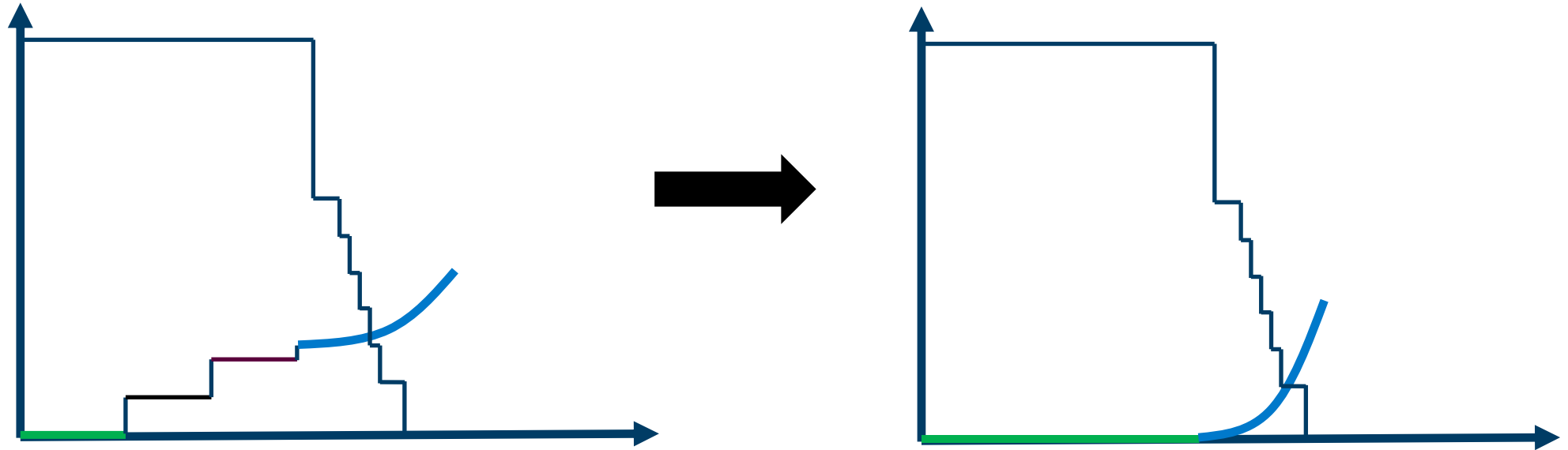
- Hydrogen
- Batteries
  
- Demand response
- Wind and solar
- Hydropower expansions
  
- ...





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# Impact on Prices & Water Values





# Planned Deliveries

- Methods, algorithms and prototype functionality
- A new research prototype power market model
- Scenarios of a 100% renewable electricity system
- Analyses using prototype models on scenarios
- Knowledge building/sharing through workshops and technical meetings
- Education at PhD and MSc level





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# Principles

- EMPS + prototypes Fansi and Primod form “project background”
  - Use to validate scenarios
  - Primod may be used in testing of new functionality
- Relation to LTM
  - New knowledge and experience guide further development of LTM
- Developed code will – as a principle – be open





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# Why this type of project?

- What works today may not be good enough for tomorrow..
- Knowledge needed when designing next generation market models
- RES100 project allows important competence building
  - Important for society/industry
  - Crucial for the group
- Stay tuned ... results to come!