

Open-source Modelling Tools for Energy Planning

As energy systems change quickly and become more interconnected, planners need tools that are easy to trust, easy to adapt, and quick to use.

This workshop is aimed at TSOs, DSOs, public authorities, consultants and researchers who work with energy planning. It introduces **Spine Tools**, an open-source suite that helps you organise energy data, manage “what-if” scenarios and run repeatable analysis workflows.

Spine Tools also support advanced planning needs such as working with different time horizons, representing uncertainty, exploring investment pathways and generating several “good-but-different” options that are close to the best solution, so you can compare trade-offs rather than rely on a single answer.

Alongside Spine Tools, the workshop presents new components developed in the **Mopo**¹ project that help turn raw information into model-ready datasets and make scenario and workflow management more efficient for medium- and long-term planning. You will also see practical examples, including Pan-European and Irish case studies.

By using the Interoperable Energy System Data Specification (**INES**), models and datasets can be shared in a common format, making it easier to move work between tools, connect models together and test tools on the same data.

The **hands-on session** gives practical experience using Spine Tools with the Baltic case dataset (computers with Spine Tools installed will be provided during the session).

A **certificate** will be provided to confirm your participation in the workshop.

Registration

¹ Mopo is a Horizon Europe project combining component tools producing input data to create model-ready datasets, scenario and workflow management, and medium and long-term energy system planning. The aim is to provide a user-friendly, open-source and validated set of tools to benefit decision-makers in network operation, industry and public authorities. Grant agreement ID: 101095998.



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Agenda

21 May 2026 (08.45 – 17.00 EEST)

Venue: Riga Technical University, Ķīpsala

Morning session: 6A Kipsalas Street, Faculty of Civil Engineering and Mechanical Engineering, 2nd floor, conference room "Mush-room"

Hands-on session: 10 Zunda Krastmala Street, DITEF, Computer Class No. 122

Registration



Scan Me

Item	Time	Session
08:45		
Registration and welcome coffee		
#1	09:00	Welcome by RTU <i>Anna Mutule</i>
#2	09:05	Introduction to Mopo and Spine Tools <i>Niina Helistö, VTT</i>
#3	09:25	TSO: planning and barriers <i>Antons Kutjuns, AS "Augstsprieguma tīkls"</i>
#4	09:45	DSO: planning framework <i>Aleksandrs Gavrilovs, AS "Sadales tīkls"</i>
#5	10:05	Q&A
10:30		
Coffee Break		
#6		Mopo session
	10:50	Pan-European Framework for Energy System Planning in Spine Tools. <i>Álvaro Porras, EPRI Europe</i>
	11:10	CorRES tool (Correlations in Renewable Energy Sources). <i>Matti Juhani Koivisto, DTU</i>
	11:30	Network Reduction Model: Enhancing Efficiency in Power System Analysis. <i>Muhammad Numan, UCD</i>
	11:50	INES: an interoperable data format for energy system planning models. <i>Tars Verschelde, KU Leuven</i>
	12:10	Hydrogen case study for Ireland. <i>Jody Dillon, EnergyReform</i>
	12:30	Q&A
13:00		
Lunch break		
#7	14:10	Hands-on session – Baltic Case Study * <i>Diana Žalostība, Kārlis Baltputnis, RTU</i>
#8	16:00	Feedback & Discussion
#9	16:30	Networking
17:00		

*** The practical session will be held in the computer lab, however participation with your own computer is encouraged. Contact us for instructions on how to install the necessary software: jana.teremranova@rtu.lv**



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Session abstracts

Introduction to Mopo and Spine Tools

Niina Helistö, *VTT*

The presentation gives an overview of the Mopo project as well as its objectives and approach. It introduces the data, scenario and workflow management software Spine Toolbox, as well as the flexible energy system optimisation framework SpineOpt, which together provide a user-friendly, comprehensive and open-source solution for energy system planning.

Pan-European Framework for Energy System Planning in Spine Tools

Álvaro Porras, *EPRI Europe*

Starting with disparate European datasets, we trim, reconcile, and align them so only planning-relevant signals remain. We then package the case in the INES spec, an interoperable, model-agnostic format, so a single, curated source can feed several model builds. The talk is about the *process*: careful ingestion and reduction; INES packaging with clear provenance; scenario sets that can be rerun and compared; automated runs and lightweight reporting. We'll show the Pan-European case moving through this pipeline and close with results in SpineOpt.

CorRES (Correlations in Renewable Energy Sources)

Matti Juhani Koivisto, *DTU*

Planning future energy systems with a high proportion of variable renewable energy (VRE) requires an in-depth understanding of VRE generators' spatial and temporal correlations across entire continents. CorRES (<https://corres.windenergy.dtu.dk/>) is an open-source data processing and modelling tool designed to address this exact challenge. This presentation introduces CorRES and explains how it supports long-term system planning and advanced energy modelling.

Network Reduction Model: Enhancing Efficiency in Power System Analysis

Muhammad Numan, *UCD*

This presentation will explore the development and application of a network reduction model designed to simplify large-scale power systems while preserving critical electrical characteristics. I will discuss the methodology and validation of the model, including test cases and a European case study that demonstrates its effectiveness in real-world scenarios.

INES, an interoperable data format for energy system planning models

Tars Verschelde, *KU Leuven*

The INES specification defines the format for an interoperable data set. This idea of this format is to be an intermediate point between different data sets and models such that every model only needs two conversion tools to be able to access data formatted for other models.



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Hydrogen case study for Ireland

Jody Dillon, *EnergyReform*

The presentation offers Ireland case study used Spine tools to model different potential hydrogen pathways and requirements for seasonal. A comprehensive model of the European power and energy system was used to achieve realistic modelling of interconnector flows with more detailed model of Ireland, including reserves, inertia, DC interconnectors, etc., investigates different investment options for different scenarios of adoption of hydrogen as a fuel source across sectors.

Hands-on session – Baltic Case Study

Diāna Žalostība, Kārlis Baltputnis, *RTU*

In this session, participants will have an opportunity to acquaint themselves with Spine Toolbox. They will work with a pre-built, simplified Baltic power system model that incorporates several of the key building blocks of a SpineOpt model. With the guidance of a tutor, they will make additions and modifications to the model, exploring concepts like modelling energy storage, setting up scenarios, and representing different kinds of generation technologies. They will also run the model and explore its results.



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