THE PROJECT

Smart4RES aims to bring substantial performance improvements to the whole model and value chain of renewable energy (RES) forecasting technology, from data to applications. The objective is to support efficient power system operation under high-RES penetration by 2030 and beyond.

THE PARTNERS

Research centers

MINES PARIS · PSL · ARMINES · METEO FRANCE · DTU · INESCTEC · DLR · ENEXEY ICCS

Solution providers & Innovation manager

energy & meteo systems · WHIFFLE · DNV · Dowel innovation

DSO & Utilities

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To follow our project progress please visit
www.smart4res.eu

Smart4RES Project

Smart4RES

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DATA SCIENCE FOR RENEWABLE ENERGY FORECASTING

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 864337

THE VISION

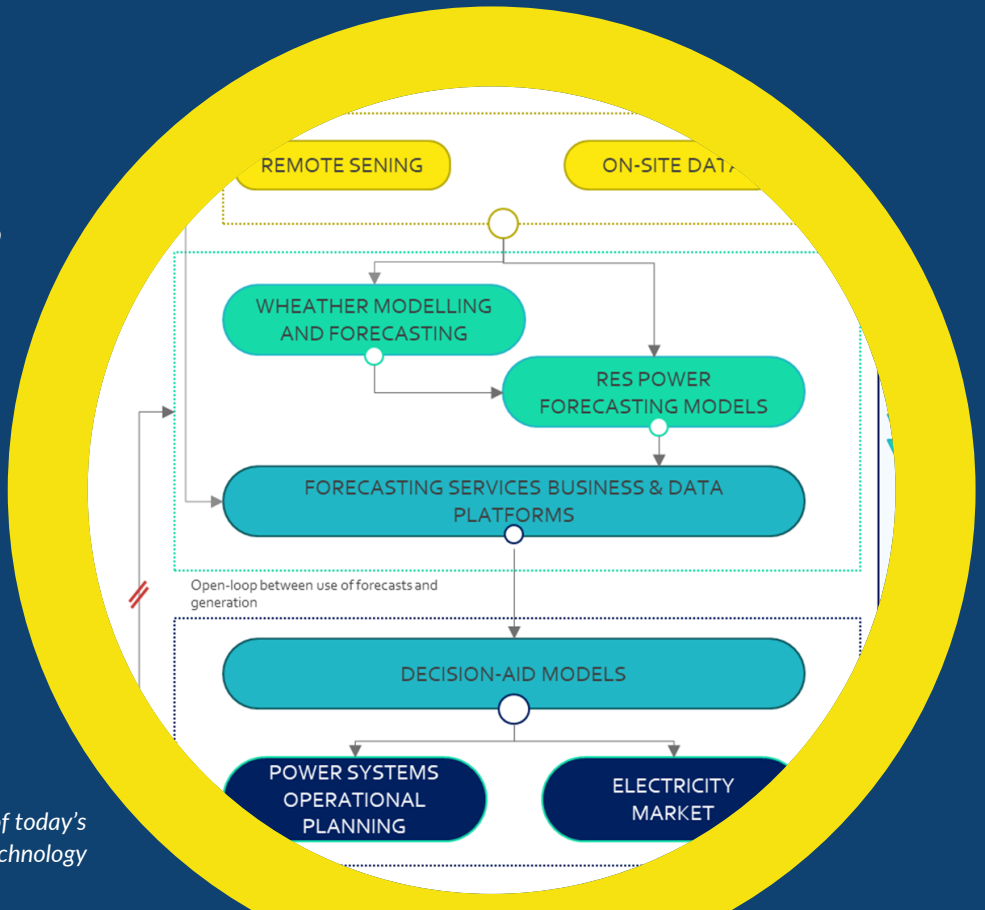
The digitalisation of the energy sector has led to the emergence of a wealth of data. These data are a game changer for RES forecasting. In combination with current computational and data storage capabilities, they can boost the potential of today's new, adapted modeling and decision-making tools.

The project builds the foundation for the next generation of modelling and short-term forecasting tools of weather-dependent RES power production.

Accurate short-term forecasts of RES generation, a few minutes up to days ahead, is a prerequisite for the secure and economic operation of power systems with high-RES penetration.

THE CONCEPT

Smart4RES aims to develop and validate a set of **tools for RES forecasting and decision-support**, meeting the needs and requirements of the large variety of stakeholders in our energy systems. A number of use cases considered focus on RES coupling with storage, power systems management at different spatial scales, and RES participation in multiple markets. The aim is to produce modelling and forecasting tools that are of general value, easily replicable, scalable and not application-specific.



Overview of the model and value chain of today's RES forecasting technology

THE PRODUCTS

High-resolution forecasting approaches

Smart4RES develops ultra **high-resolution weather forecasting solutions with dedicated products for the RES sector**. Seamless solutions are proposed for weather and RES forecasting that simplify the overall model chain. They all make **optimal use of multiple sources of data,** such as remote sensing, real-time measurements from assets, and more.

Data markets and collaborative forecasting

The project develops alternative approaches that maximise the value of data, **including privacy-preserving data-sharing and collaborative forecasting**. It also designs an innovative **data marketplace for RES time series together with new business models** to remunerate agents who contribute to increasing RES forecasting quality and value in applications.

Decision-aid tools for power system applications

AI-based solutions are developed for fast security assessment in isolated power system and flexibility management of TSOs and DSOs.

A **prescriptive approach for bidding RES production and storage on multiple electricity markets** is also proposed to efficiently link data with decisions.