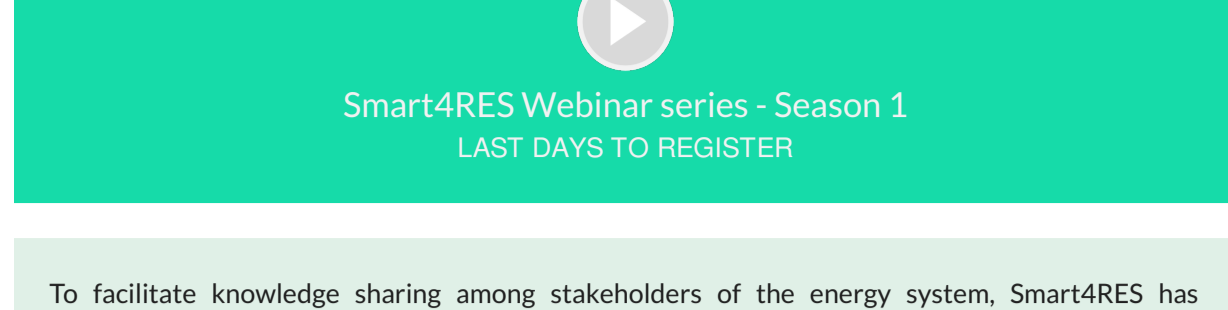




Newsletter #5
- June 2021 -

Editorial

Dear partners and colleagues,
Smart4RES has completed its first reporting period. Significant progress has been achieved in all the work packages and consortium members have been very proactive in knowledge sharing.
We are pleased to present the 5th issue of the Smart4RES newsletter summarising these last months.
We hope to meet you in person very soon! Enjoy reading!



To facilitate knowledge sharing among stakeholders of the energy system, Smart4RES has launched its webinar series. Setting up the scene of the project, Season 1 aims to present the Smart4RES approach towards a new standard for the entire RES forecasting value chain.

Last chance to register to the 4th Smart4RES webinar!

On June 09th, Smart4RES will present its fourth webinar 'Optimizing participation of renewables generation in multiple electricity markets: Smart4RES vision, opportunities, and role of forecasting'. During this webinar Smart4RES proposes optimisation methods for trading tools, considering multiple market opportunities, high-resolution forecast, and prescriptive analytics.

[Read the key messages.](#)

[Register](#)

Intended audience: Decision-makers from the energy sector and the power system industry, RES producers, aggregators, grid operators, RES traders, Academia, Regulation bodies.



In 2021, four episodes will complete this series of webinar, addressing the following topics:

- Episode #5 – September 2021 Optimising the value of storage in power systems and electricity markets
- Episode #6 – October 2021 Modelling tools for integrating RES forecasting in electrical grids

[Stay tuned for more information!](#)



Update on WorkPackages

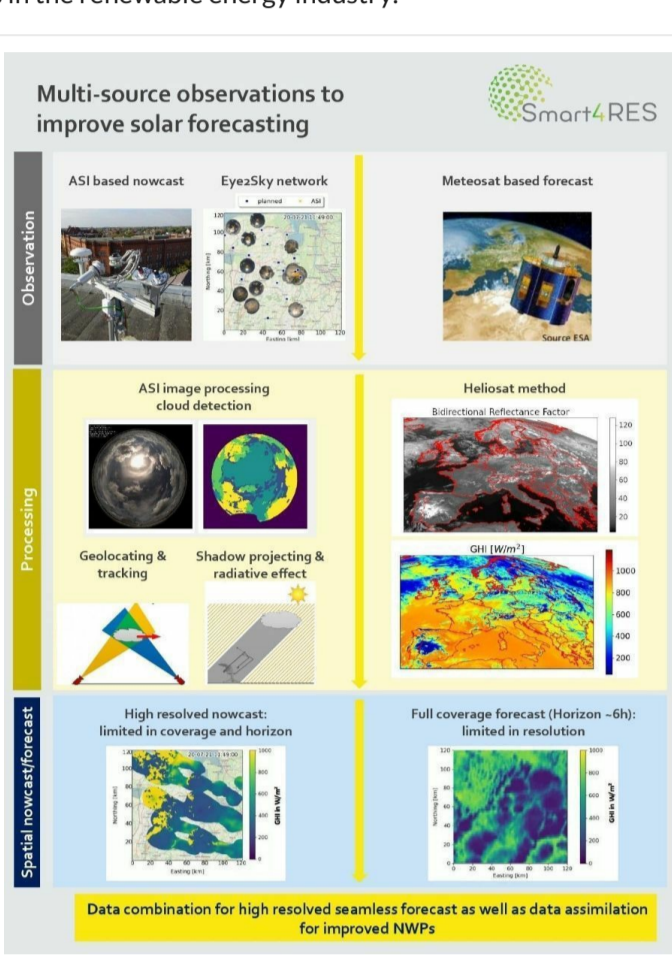
Design of forecasting framework and data management platform

The objective of WP1 is to "set the scene" for a logical forecasting model-chain that covers the requirements of current and future power systems and electricity markets with near-100% RES. In order to ensure an efficient development of forecasting and decision-aid tools, the WP Leader, ARMINES, together with its contributing partners (EMSYS, DLR, EDP, INESC, HEDNO, Meteo France and Whiffle), have been working on the launch of a data management platform.

Furthermore, high-quality datasets have been provided by some of the Smart4RES Reference Group members.
The Reference Group consists of major players in the renewable energy industry.

Next generation weather forecasting models for RES purposes

WP2 aims to improve the design of Numerical Weather Prediction (NWP) as well as satellite and sky-imager based forecast and their contribution to optimally fit the RES-purposes. Progress has been made since our partner MF has succeeded in obtaining high-resolution predictions and improvement was detected by our partners Whiffle and DLR on their respective tools: Large Eddy Simulation (LES) and Eye2Sky network.



Credits: © Smart4RES

To get more insights, many key points were addressed during the Smart4RES webinar episode 3 on Advanced weather forecasting for RES applications. This episode was presented in two parts:

- ep 3.1 deals with Smart4RES developments towards high-resolution and Numerical Weather Prediction solutions to improve RES forecasting models. [Read the key messages.](#)
- ep 3.2 addresses multi-source observations to improve solar forecasting within the Smart4RES project. [Read the key points.](#)

Don't worry if you missed it, you can still watch the replay of the webinars and read about the key messages.

[Watch the replay ep 3.1](#)

[Watch the replay ep 3.2](#)

Data Science and the future of RES forecasting

WP3 objectives are (1) to perform a direct evaluation of the benefits brought in by the NWP improvements obtained in WP2, as revealed through power conversion and further post-processing, in particular, for the use cases defined in WP1 and (2) develop complementary approaches to blending information from multiple sources of information, e.g. remote-sensing for improved power forecasting. Over the last period, EMSYS, DLR, DTU and ICCS have successfully started to use multi-source data approaches to improve short-term RES forecasting. So far, Lightning data, SkyCam Images, Lidar Measurements, Satellite Images and power measurements have been used and combined with Numerical Weather Predictions.

On its side, ARMINES further generalized its model for seamless RES forecasting which now can be applied generically to different energy sources.

Collaborative Framework to RES Forecasting and Resulting Business Models

WP4 invites us to rethink the approaches used for data sharing applied to RES forecasting. Such data is distributed geographically but also in terms of ownership, with concerns when it comes to data sharing. To learn more, we invite you to watch a replay of our webinar about Extracting value from data sharing for RES forecasting: Privacy aspects & data monetization.

- To learn more, we invite you to watch a replay of our webinar about Extracting value from data sharing for RES forecasting: Privacy aspects & data monetization.

[Watch the replay](#)

- A short article about Rethinking Renewable Energy Forecasting Business Models has been published in Medium by the consortium partner INESC-TEC.

[Read the article](#)

Modelling Tools for Integrating RES Forecasting in Electrical Grids, Electricity Markets and Storage Operation

The aim of WP5 is to develop decision-aid strategies for different use cases involving storage and RES, which use uncertainty forecasts (from WP2-WP3). Innovative modelling and decision-aid tools to support the integration of renewable energy in power systems and electricity markets have been identified and specified by all the partners involved in the WP. Seven solutions have been identified and are under development:

- Multi-objective optimization problem to derive optimal market offers that jointly maximize the revenue of RES power plants in multiple markets and minimize battery storage degradation.
- Optimization problem for the Day-Ahead Scheduling in isolated power systems considering the capabilities of battery storage as well as the RES forecast uncertainty.
- Dynamic security assessment algorithm in the dispatching and operation of isolated systems.
- Predictive management of electrical grids with information about RES and load forecast uncertainty and considering different flexible resources.
- Hierarchical load and flexibility forecasting for electrical grids.
- Novel formulation of the market participation problem for RES considering population effect.
- Data-driven approach for trading strategies for VPP based on prescriptive analytics.

First results have been presented during the Wind Energy Science Conference 2021 (WESC 2021), 25-28 May 2021. Conference presentations and abstracts are available [here](#). Full papers are in preparation.



Highlights on events and publications

Smart4RES publications and other scientific communication are available in the [Smart4RES Resource Center](#).

International conferences and workshops

Past events

Smart4RES partners have been participating in key international events in recent weeks. Download the presentation material [here](#).

- Wind Energy Science Conference, 25-28 May 2021 (INESC-TEC, ARMINES)
- Energy Storage World Forum 17 May 2021 (EDP NEW Energy and ARMINES)
- EGU General Assembly 30 April 2021 (ARMINES)

Upcoming events

Join us at the 14th IEEE PowerTech 2021 Conference - June 28th/ July 2nd 2021! (online)

- Two papers by DTU have been submitted to the 14th IEEE PowerTech 2021 Conference:
 1. In the framework of WP1 (new forecast products): Adaptive Generalized Logit-Normal Distributions for Wind Power Short-Term Forecasting. Download the [Preprint](#).
 2. In the framework of WP4 and WP5 (data monetization and energy markets): Monetizing Customer Load Data for an Energy Retailer: A Cooperative Game Approach. Download the [Preprint](#).

- ARMINES will also present a paper focusing on A Value-Oriented Price Forecasting Approach to Optimize Trading of Renewable Generation. The preprint is available [here](#).

EU PVSEC - 06/10 Sept 2021 (online)

DLR will present Improved hybrid solar irradiance nowcast: combining all sky imager and persistence based nowcasts at the 38th European Photovoltaic Solar Energy Conference (Session 'Forecasting Solar Radiation and PV Power') to be held on Tuesday, 7 September 2021. For more information, consult the [conference website](#).

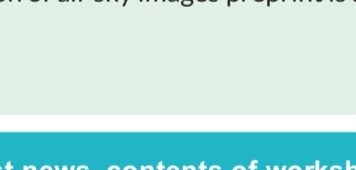
Publications and scientific communications

Recent publications

Recently, DLR has submitted two articles in the Atmospheric Measurement Techniques Discussions journal:

- A method to measure Cloud base height (CBH) using a network of All-Sky-Imagers (ASIs) to enhance accuracy is presented in the article Cloud height measurement by a network of all-sky-imagers. The preprint is available [here](#).
- The second article presents a new approach to exploit unlabeled image data from ground-based sky observations to train neural networks. Applying self-supervised learning for semantic cloud segmentation of all-sky images preprint is available [here](#).

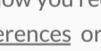
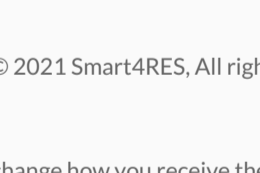
Don't miss Smart4RES's latest news, contents of workshops and webinars by visiting our [Smart4RES website](#)



[Twitter](#) [LinkedIn](#) [Website](#)

Copyright © 2021 Smart4RES. All rights reserved.

Want to change how you receive these emails?
You can [update your preferences](#) or [unsubscribe from this list](#).



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 691000. The present document reflects only the author's view. The European Innovation and Networks Executive Agency (INEA) is not responsible for any use that may be made of the information it contains.