

#3/2020

# Newsletter



Dear cross-border colleagues,

Dear friends of sustainability research in the Upper Rhine region,

In this third newsletter edition, we are sharing insights on progress on the project work, changes that were made due to the current situation in the world and plans for upcoming events and project outputs.

In this issue, we also introduce the work of the last of our seven work packages.

We wish you happy reading!

The RES-TMO Coordination Team in Freiburg



## 1. The project at a glance

RES-TMO is a three-year project funded by Interreg V Upper Rhine, and it was developed in the framework of the [Upper Rhine Cluster for Sustainability Research \(URCforSR\)](#). The project aims to accelerate the energy transition by uncovering synergies from complementary generation, demand and storage capacities, as well as cross-border energy initiatives in the trinational Upper Rhine metropolitan region. The work of the RES-TMO project is organized around seven work packages, or WPs in short. In this issue, we will be introducing you to the work of WP7, that focuses on data security in smart grids and develops solutions for data protection. We will also give a short update on the work of other WPs.

Detailed information on the project can be found on [our website](#), where you can also find our [previous newsletters](#).

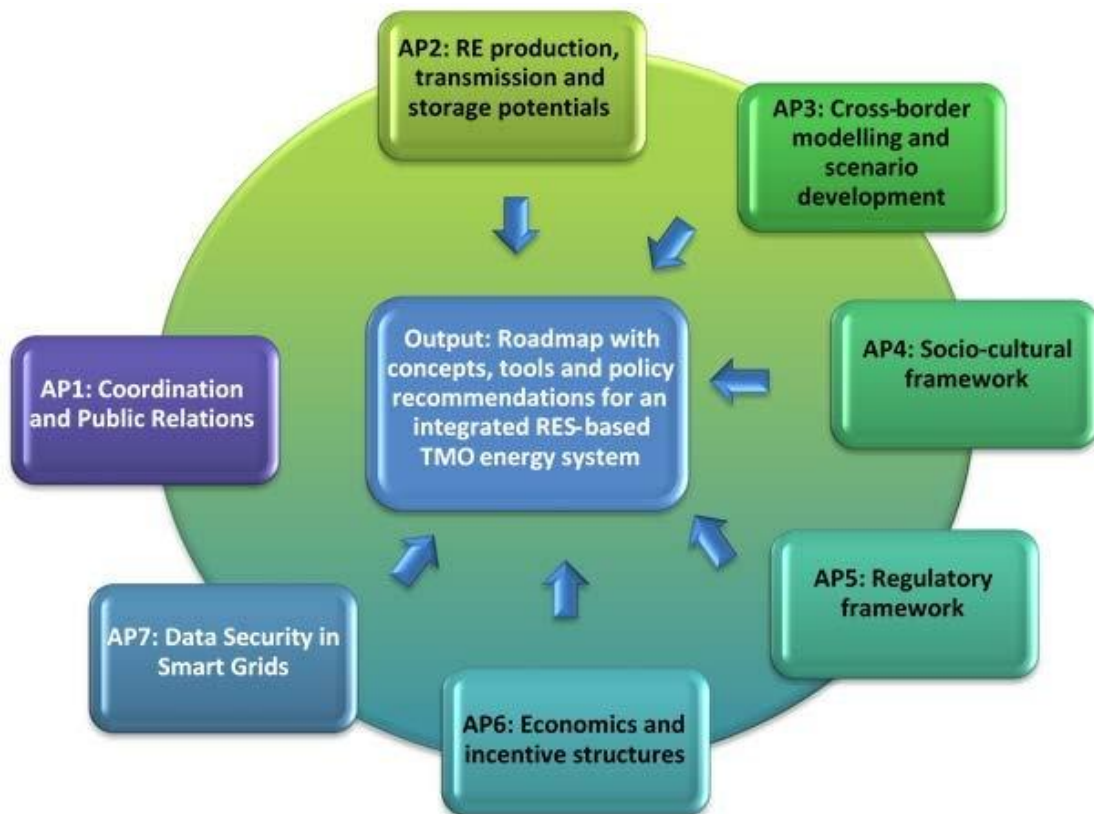
## 2. Data Security in Smart Grids (WP7)

### Update on activities

Energy security in general and cyber-physical security is one of the hottest topics in the energy sector nowadays. In modern smart electrical grids, we try to use information flows to optimize energy flows. Information transferred between different capturing, processing and controlling points could do us a huge favor in determining the necessary load capacities as a time function.

However, using this type of technological tools could be a double-edged sword as information can be pirated, edited and re-injected into the system to compromise and control the grid's monitoring devices, or to edit information in order to incite incorrect response to the real demand resulting in huge chaos in the system.

## Work Packages



WP7 in the RES-TMO project takes a multidisciplinary approach, combining technical knowledge with a reflection on regulatory and social contexts. The aim is to evaluate the cyber-physical security of the energy systems in the tri-national context, emphasizing differences between adopted mechanisms in the three countries.

#### *Main activities*

The researchers are currently working on a technical state of the art concerning the cyber-physical security in microgrids. This focus is linked to the important role of microgrids in pushing the power system over the edges of decentralization, based on the fact that a geographically localized distributed power model makes more sense regarding risk-management in terms of regional resilience and preventing cascading failure in the event of weather events, cyber-attacks, etc. Energy communities or microgrids are also a very effective solution in terms of managing the current grid problems regarding control mechanisms and scalability.

The aggregation of multiple integrated entities or microgrids that are supervised, monitored and controlled via a reliable communication-based layer

can help to avoid costly network reinforcement along with maintaining aspired values of the smart grid.

Not to mention that it could be the only available solution that integrates multiple sources of small-scale renewable energy into the utility grid. The results from the latest work have been published in a [scientific journal](#) (see 5. Publications).

Other aspects such as European regulation concerning grid code and grid-edge devices development are still being investigated, legal reports and European directive texts have been gathered and a review on the basic elements that have been addressed and gaps is in progress.

The social aspect and public acceptability are also envisaged as an important input that contributes to drawing a holistic image of the actual situation. In collaboration with the work package 4, we have organized a meeting with the mayor of Ungersheim, where we discussed the question of public rejection of the Linky smart meter in France and especially in the Alsace region. The same extension of discussion was also presented in our technical meeting with representatives from RTE, ENEDIS and Badenova.





### 3. Updates on other parts of the project

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**WP2** ([Analysis of Renewable Generation and Storage Potentials](#)) preliminary results are focused on wind energy potential and take into account meteorological, geographic, legal, technical and economic factors, as well as the existing network topology. The WP has found an increased wind energy yield with increasing height in Switzerland and France. In Germany, the wind energy yield remains roughly constant with altitude. It has been also found that near-surface (shallow) geothermal energy has high potential, especially in suburbs and smaller communities with many single-family homes. In cities, heat energy consumption is usually high and, at the same time, there is no room for geothermal probes due to the narrow building development.

**WP3** ([Modelling and Scenario development of TMO Energy System](#)) has been investigating investment assumptions for energy scenarios, including deriving cost learning curves from literature. Initial results from the work package also reveal that substantial carbon emissions reductions are unlikely without the use of storage technologies, as a means of replacing fossil back-up plans. The upscaling of storage technologies is essential from a prosumer and regional perspective. These will be investigated in the TMO market model, which considers amongst other elements the long-term development of fuel, carbon and technology costs up to 2050.

**WP4** ([Analysis of Sociocultural Framework Conditions and Integration of Stakeholder Perspectives](#)) has completed the first phase of fieldwork and is nearing the completion of the second one (42 interviews in France, Germany and Switzerland). A case study on citizen participation in RES is also almost finished. Current work focuses on book and paper writing in collaboration with the SAGE team from WP5. Two interns are also conducting interviews with 29 key actors in Alsace.

**WP5** ([Analysis of the Regulatory Framework](#)) finds that the development of RES is being encouraged overall, though there are national differences and market dynamics to account for. The WP5 group is in the process of preparing a brochure ("Comparative views on the regulation of RE in the trinational Upper Rhine region") to provide a synthetic overview of the RES regulations in the Upper Rhine region. In addition, work is proceeding on a number of publications, including updating chapters on EU energy and environmental law.

**WP6** ([Economic Framework and Incentive Structures](#)) has almost completed an analysis of the current situation. As part of this, and in cooperation with WP4, the group is conducting interviews in Germany and Switzerland, and has trained an intern for this role. Ten interviews have been completed; two remain to be done in Switzerland. The team did not experience too many challenges connected with COVID-19.



### 4. Upcoming events

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3rd Stakeholder Workshop on energy decarbonization pathways, related technologies and challenges: 10 November 2020. Organizer: Coordination Office. Online.

RES-TMO Mid-Term Event: 1 December 2020. Organizer: Coordination Office and TRION-climate e.V. In Freiburg in German and French. *To be postponed or held online.*



## 5. Publications

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Philippe Hamman, Marie Mangold (2020). « Les coopératives énergétiques, levier de transition écologique ? Quelques réflexions comparées France-Allemagne-Suisse-Belgique », Revue Etopia, n 14, 2020, pp. 137-174.

Bushra Canaan, Bruno Colicchio, DjaffarOuldAbdelsam (2020). "[Microgrid Cyber-Security: Review and Challenges toward Resilience](#)". Explanation: Providing a broader perspective on the cybersecurity problematic in the power sector, precisely in microgrids building blocks. Appl. Sci. 2020, 10, 5649.



Concepts for an Integrated, Efficient and Sustainable Energy Supply and Storage in the Upper Rhine Region

University of Freiburg, Chair of Remote Sensing and Landscape Information Systems (FeLis)

Project lead: Prof. Dr. Barbara Koch

Project management: Ines Gavrilut

Contact: [ines.gavrilut@felis.uni-freiburg.de](mailto:ines.gavrilut@felis.uni-freiburg.de). [www.res-tmo.com](http://www.res-tmo.com)