A Report on the RENergetic TSO-DSO workshop

On the 27th of October RENergetic project organized an online webinar, addressing challenges TSOs and DSOs are facing during the energy transition. Overall, 30 participants attended the online event. Energy sector experts from several European countries brought forward their experiences from current research projects and presented challenges they are facing and possible solutions. This report briefly summarizes the outcome of this workshop.

TALK 1: Self-Sufficiency and Ancillary Service Provision through energy communities: insights from RENergetic

Armin Stocker from RENergetic project started the meeting with a presentation about project findings from the investigations, how energy islands[1] and energy communities can become more self-sufficient and provide ancillary services at the same time. RENergetic project focuses on how to develop replicable solutions for energy islands, aiming to offer micro-services to its residents. These includes among others multi-vector optimization, demand response in the heat and electricity sector, as well as electricity-supply optimization. It was demonstrated how a potential energy island manager could make use of the existing flexibility potential within the energy island to optimize its self-sufficiency or offer potential ancillary services to the DSOs and TSOs. Self-sufficiency must thus not conflict with grid-friendly behaviour. Energy communities and energy islands as such can therefore play an important role in the energy transition.

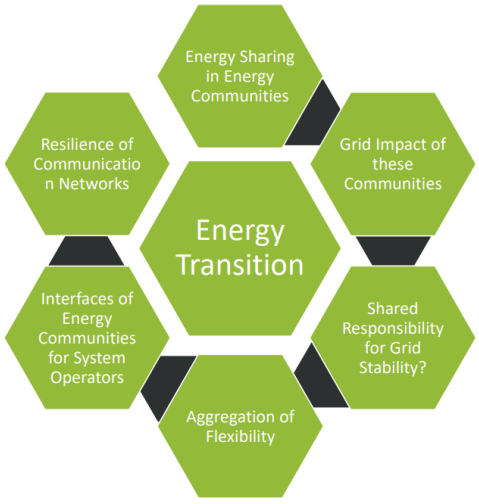

Figure 1: Excerpt from the talk 1 on RENergetic goals

TALK 2: Practices of Energy Sharing in different EU Member: Reports about the Solutions and Current Issues from Fluvius and EnergieKompass

The second part of the workshop aimed to provide the participants with insights about the practices of energy sharing within energy communities, which were introduced in the European Clean Energy Package. Gert Mergan, responsible for data management at the Belgian DSO Fluvius, reported how the practice is currently being implemented in Belgium, Flanders. There are currently different types of sharing possible in Flanders: energy sharing between buildings with the same net user, peer-to-peer selling, energy sharing within the same building and multiple peer-to-peer trading. Overall, there are now 155 energy groups, practicing energy-sharing. The DSO plays here an important role as a facilitator. The energy community hosted by the DSO, has to be registered and has to share the meter data with

[1] *Energy islands are defined in the project as delimited area of consumers and producers that seeks to become more self-sufficient in respect to energy usage*

the DSO. Subsequently, the energy bill considers the calculation ex-ante based on the amount of energy shared. The implementation of energy-sharing remains however difficult due to the current traditional market structure. The amount of shared energy between the participants is still quite low, since participants are not aligned to each other. Gert Mergan also pointed to a recent study from the Belgian regulator VREG, which concluded that energy-sharing practices currently have a minor positive impact on the grid and the avoidance of grid congestions. In his view, a 3-step approach would be necessary: 1) forming energy communities; 2) giving optimization incentives and 3) providing flexibilities.

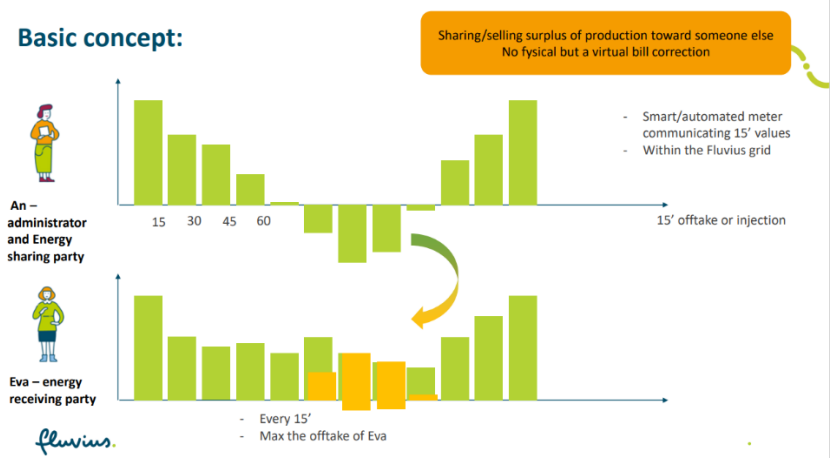

Figure 2: Excerpt from the talk 2 on energy-sharing practices in Belgium

Additionally, Michael Niederkofler from EnergieKompass presented the Austrian experiences with energy-sharing in the pilot case renewable energy community "team4.energy". The energy community collects the information of the participants about the locally produced amount of energy and sends it to the web platform. The surplus energy is pooled and distributed to all consumers. The members cannot choose who they want to trade with and peer-to-peer trade is in general not allowed. The price cannot be set by the community, the grid fee reduction for the locally shared energy depends on the grid layer the community is connected to. Operation of renewable energy communities is not trivial. It is a social, administrative, and technically challenging task, which requires expertise and effort. Financial benefits are limited which makes paying for expert services difficult. In the discussion round, Michael Niederkofler commented the potential positive impact of dynamic grid fees, which would motivate energy communities to adjust their energy generation and consumption according to the pricing. Implementation should be done in a simple way, to not endanger the acceptance rate of the energy community concept. Gert Mergan equally advocated for a gradual development of grid fees towards a more dynamic approach.

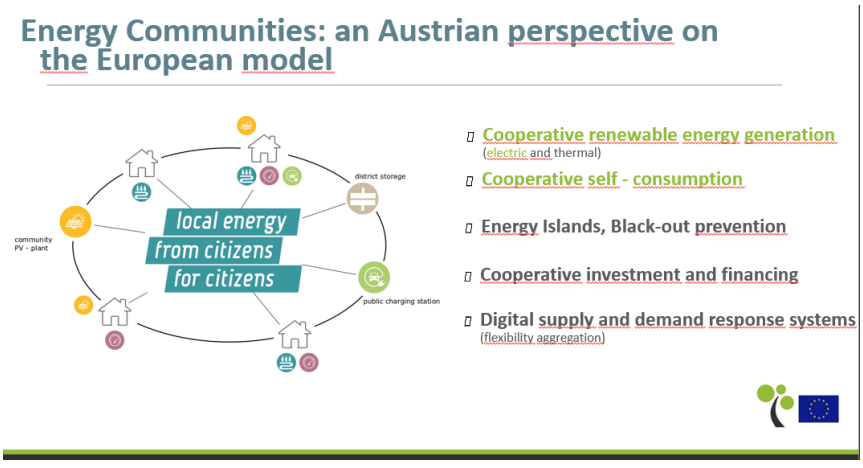

Figure 3: Excerpt from the talk 2 on energy-sharing practices in Austria

TALK 3: Simplified market access for flexibility: reports from the Austrian projects: Stromausgleich Österreich and Industry4 Redispatch

The energy system requires flexibility, especially with the decline of conventional power plants and the increasing utilization of volatile energy sources, such as PV panels. Thus, flexibility potentials of small-scale decentralized resources at low-voltage levels must be identified and operated accordingly, to mitigate the fluctuation of energy supply. In this context, Markus Riegler and Felix Hembach from APG presented the project results of: *Stromausgleich Österreich* – a market access facilitation platform to ease the accessibility of different services to the TSOs and DSOs such as balancing services and redispatch. They explained how through a simplification of a *single-point-of-entry* enables smaller market actors to participate in different energy markets. For this solution, a market access facilitation platform was developed as a communication tool between the market participants and the flexibility market. APG used the international EQUIGY standard to harmonize interfaces and processes. In the long term, the platform is ought to simplify market access to additional markets and services such as the intraday market.

In another research project – *Industry4Redispatch*, APG and AIT tested, how industrial customers flexibilities could be used for redispatch purposes. Load and generation schedules were shifted to change load flows, positively contributing to the grid congestion management. Regina Hemm reported on how the project addresses the existing gap of coordinating renewable energy plants and industries flexibility potentials to coordinate industry production times and the needs of system operators. Through their *Redispatchmodule*, APG connected several partners from the energy sector, including industrial customers, flexibility service providers, and system operators. The project addresses aspects of redispatch requirements with concrete use cases, solutions for an effective TSO-DSO interaction, and flexibility bids dimensioning to be suitable for asset and system operators.

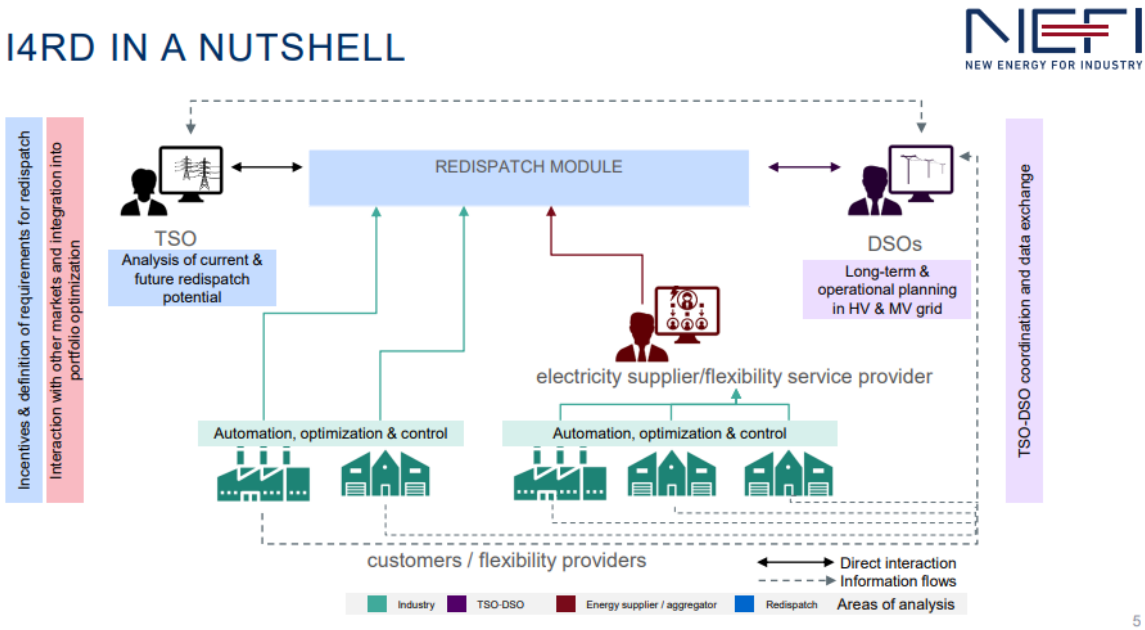

Figure 4: Excerpt from the talk 3 on I4RD

Regina Hemm highlighted that, what is theoretically possible is different from the technical and practical feasibility. Despite a considerable flexibility potential among different industries, most companies are not actively using their flexibility. To counteract the problem of grid capacities in times of redispatch activation, a particular model for bid calculation was developed, enabling the DSOs to limit the bids activation in advance, thus, avoiding e.g., congestions.

TALK 4: New Concepts for Resilient Communication in Smart Grids: report from EnerSat

Last talk, given by Anna Volkova took the participants to the outer space. She described the current concepts for resilient communication through Low Earth Orbit satellites and how TSOs and DSOs could still be able to communicate among each other's in cases of blackouts and extreme weather situations, whenever the traditional communication technologies would fail them. The project analyses how satellite communication networks can support system operators in different scenarios in their decision-making.

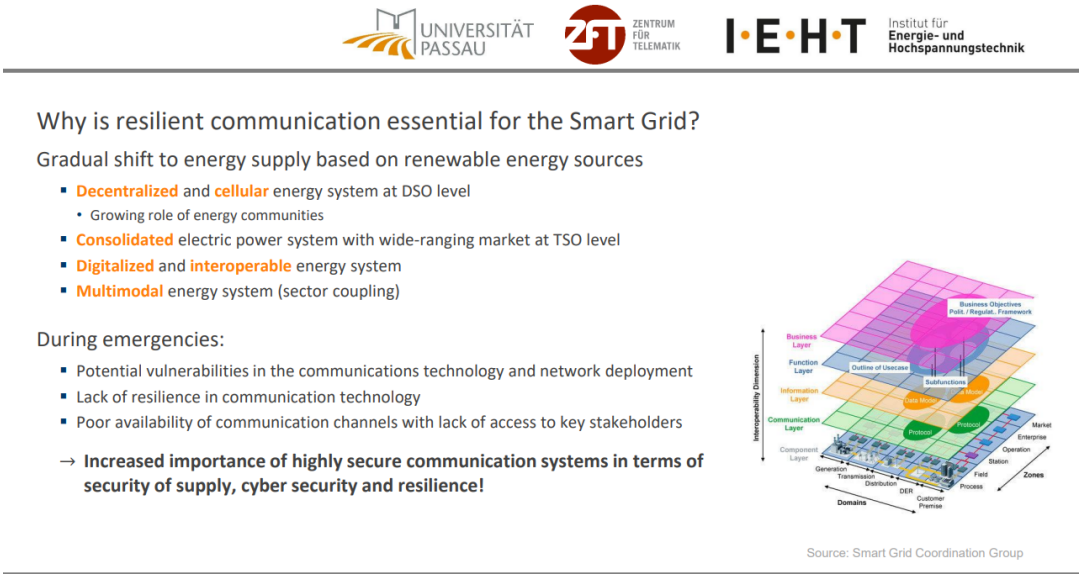

Figure 5: Excerpt from the talk 4 on resilient communication in Smart Grids through LEO-Satellites

Anna Volkova additionally explained that Low Earth Orbit satellite technology is not to be regarded as an alternative solution to the existing 450 MHz communication technology, but rather as a complementary one, allowing TSOs and DSOs to use satellites in areas and cases where other technologies would not be available.

Conclusion from the Workshop

The workshop demonstrates the diversity of current challenges TSOs and DSOs have to face. The market structure is rapidly changing, allowing decentral actors such as the energy communities and industrial actors to actively participate in the energy transition. For this to happen, the cooperation with the DSOs and aggregators is crucial and innovative solutions for both the internal energy management and the participation on the established external markets are key. Additionally, TSOs and DSOs can use new technologies such as satellites networks for a resilient communication, preparing them for different emergencies and reducing the dependencies between critical infrastructures (power system and communication network). In sum, the current tasks of TSOs and DSOs are ever-changing, especially during the energy transition. However, simultaneously, innovative approaches from industry and research arise to master these challenges.

Contact details of the speakers;

- Talk 1: *armin.stocker@uni-passau.de*
- Talk 2: *gert.mergan@fluvius.be*; *niederkofler@energie-kompass.at*
- Talk 3: *felix.hembach@apg.at*; *regina.hemm@ait.ac.at*
- Talk 4: *anna.volkova@uni-passau.de*