ETIP SNET Working Groups Webinar Series #4 - Key takeaways from ETIP SNET latest research on Hydrogen and Energy Data Spaces

Within the ETIP SNET initiative, the webinar series represent a big opportunity to showcase and present recently published papers to interested actors in the wider energy landscape.
This webinar, held online via Webex on April 23rd, was dedicated to the presentation of the following ETIP SNET's papers:

- ETIP SNET WG1 paper "Impact of hydrogen integration on power grids and energy systems" and a brief overview of the upcoming ETIP SNET WG3 Focus Paper under publication on Ramp-up and role of hydrogen-based power generation;
- ETIP SNET WG4 Policy paper "Energy Data Space".

Each presentation was followed by a Q&A session.

The event was attended by over 100 registered ETIP SNET experts representing different segments of the energy supply chain, as well as interested stakeholders from the wider energy landscape. Stakeholder categories include market players (<5), regulators (<5), DSOs (>10), TSOs (<5), ICT providers (>20) and non-ICT providers (<10), research and academia (>30), Interface to other energy carriers (<5) as well as equipment and manufacturers suppliers (<5) and renewable energy sources providers (<10).

Below is the webinar's agenda.

Item	Time	Session
10:00		**Start**
#1	10:00	**Welcome and introduction** by George Paunescu, Policy officer in DG ENER and Beatrice Profeta from PwC (ETIP SNET Secretariat)
ETIP SNET latest research on Hydrogen Impacts on Grids		
#2	10:05	**ETIP SNET WG1 Paper on Hydrogen's impact on grid** By Antonio Iliceto from ENTSO-E, Nuno Souza e Silva from Nester, Natalie Samovich from Enercoutim, Santiago Gallego from i-DE (Iberdrola Group)
#3	10:35	**ETIP SNET WG3 upcoming Focus Paper on Ramp-up and role of hydrogen-based power generation** By Peter Jansohn from the Paul Scherrer Institute
#4	10:45	**Q&A Session 1**
ETIP SNET latest research on Energy Data Spaces		
#5	11:00	**ETIP SNET WG4 Policy Paper on Data Space** By Antonello Monti from RWTH Aachen University, Elena Boskov Kovacs from Blueprint Energy Solution, Laurent Schmitt from Digital4Grids, Natalie Samovich from Enercoutim
#6	11:35	**Q&A Session 2**
#7	11:55	**Concluding remarks** By Beatrice Profeta from PwC (ETIP SNET Secretariat)

ETIP SNET WG1 paper "Impact of hydrogen integration on power grids and energy systems"

Antonio Iliceto (ENTSO-E), Nuno Souza e Silva (R&D Nester), Natalie Samovich (Enercoutim), and Santiago Gallego (I-DE, Iberdrola Group) presented the paper "Hydrogen's impact on grids" drafted by the WG1 and published in September 2023.
The goal of reducing greenhouse gases emissions and embracing clean energy transition requires structural changes across sectors, with social and economic impacts. In this context, hydrogen emerges as a crucial energy carrier, widely acknowledged for its potential in shaping the future energy landscape. In this sense, the paper intends to understand both the benefits and challenges associated with hydrogen, as a direct impact on power system operation and planning and, more broadly, in an optimization of whole energy system perspective.

The discussion explored key issues related to power to hydrogen developments in the context of grid integration, the optimisation and coordination of hydrogen in the energy system, market and regulation changes needed, as well as key aspects to address R&D efforts.

Key findings highlight the need for a holistic system perspective, necessary to establish an energy-efficient and infrastructure-efficient energy system. It is further remarked that the use of hydrogen on grid operation and planning can provide flexibility and improve adequacy and resilience to the power system. Nevertheless, the hydrogen sector requires heavy infrastructural investments to be coordinated with gas and electricity grid developments & end user needs. For a smooth but fast transition phase, repurposing the gas grid, also through initial blending, is a viable and smart option to enable a gradual phase-out of natural gas and set-up of a hydrogen market.

ETIP SNET WG3 upcoming Focus Paper "Ramp-up and role of hydrogen-based power generation"

Peter Jansohn (Paul Scherrer Institute) presented a first overview of the "Ramp-up and role of hydrogen-based power generation" paper elaborated by WG3 with contributions from WG1. The paper has been approved by the ETIP SNET Governing Board and will be published in the upcoming weeks.
The paper focuses on providing recommendations about the provision of hydrogen for electric power generation, as well as to showcase the hydrogen dispatchable power generation capacity for electric grid supply. Among the key takeaways, the authors advocate for innovation development (both at infrastructure and final-use equipment level), to prepare the thermo-electric power generation park to become H2-ready within the given time frame for the transition of the whole energy system. The paper additionally remarks that CO2-free Hydrogen will become in due time a main component of the integrated energy system, including production, logistics and final end-use applications.

Speakers from WG1 and WG3 were engaged with several questions by the public, including on the key enablers (from a regulatory and economic perspective) for hydrogen deployment in the grid and on the different technologies for the H2-based generation and their associated requirements.
Regarding key enablers for hydrogen deployment in the grid, it was highlighted that at the moment hydrogen is not in the market deployment phase. It will become a commodity market

when a logistic system with hubs centred around hydrogen will be in place, as the case of gas in the Netherlands. In particular, infrastructure development and a set of rules for grid access (connection code) are needed for market development. Yet, the main enablers are: i) a positive business case for green hydrogen; and ii) the involvement of key actors, such as the EU Directorate General for Mobility.
When concerns on the hydrogen efficiency were raised, the speaker replied that any conversion and storage of energy is introducing energy losses, including hydrogen. However, in view of a future optimised energy system, this will be done to compensate the variability of weather dependants renewable energy sources.
Regarding H2-based generation technologies, concerns were raised about the replacement of Genset as secured power by H2 fuel cells. In this regard, it was specified that there will not be a single technology being optimum for all applications. Out of the three H2-based generation technologies considered in the paper (i.e. fuel cells, engines, turbines), it was highlighted that H2 fuel cells will capture a share of the market depending on the individual use case and the specific requirements (e.g., power scale, operational flexibility, efficiency, cost).

ETIP SNET WG4 Policy Paper on Data Space

The speaker Antonello Monti (RWTH Aachen University), Elena Boskov Kovacs (Blueprint Energy Solution), Laurent Schmitt (Digital4Grids), and Natalie Samovich (Enercoutim) presented the "Energy Data Space policy paper" drafted by WG4 and published in December 2023.
Power systems are generating more data than ever, if well-used, this data provides insight into consumption patterns, predicts grid voltages, and helps to better manage consumption by predicting grid voltages. Leveraging data brings significant benefits to power systems, including accelerating network recovery after failure. It is fundamental to create regulatory environments that help maximize data usage.
To this end, the main objectives of the policy paper are:

- Provide a standardized definition to Data Spaces in the energy sector;
- Assess the current status and evolution of energy data spaces;
- Provide suggestions, in terms of policy and regulation, to facilitate the large deployments in Europe;
- Collect and analyse the principal use cases in the energy sector (including feedbacks from industry stakeholders).

After their intervention, the speakers were asked numerous questions by the audience, mainly concerning the data space use cases in relation to the local energy communities, and the regulatory challenges that are hindering the development and implementation of data spaces, as well as in relation to interoperability and data exchange.

Concerning the data space use cases, the paper focused on the simulation of operation and flexibility of demand and services of local energy communities. In this instance, the key role of data spaces is integrating new technologies for advanced analytical studies to identify challenges and their sources. The integration of technologies for service provision can be validated also for other services other than electricity.

One possible ways to address the challenges hindering the development and implementation of data spaces, it was highlighted that, specifically for interoperability and data exchange, one of the key enablers is the development of flexibility code. To this end, APAs, data sharing, and alignment

of DSO and TSO data interfaces to flexibility service providers are important factors. Additionally, the importance of open-source solutions was remarked bringing the example of the OneNet project which has an open-source solution developed by an international community to enable data spaces. Apart from technical and leal requirements, it was mentioned that cooperation between different EU initiatives should be prioritized to align research results to business requirements.