This project is funded by the European Union

Technical Assistance for Improvement of Performance-Based Tariff Regulation of EMRA For Turkish Energy Markets Through Introducing an Enhanced Monitoring System

Task 3.4 – Best Practices Regarding Innovation and Recommendations for Gas Distribution and Transmission Companies

Training

26th August 2020, EMRA, Ankara

This project is funded by the European Union

Agenda

- ENTSO-G Vision on Transmission Innovation
- ENTSO-G Innovative Project Platform
- Innovation Funding Mechanisms at EU Level

This project is funded by the European Union

ENTSO-G Vision on Transmission Innovation

This project is funded by the European Union

ENTSO-G Vision on Transmission Innovation

- European Gas TSOs (ENTSO-G) propose a Roadmap for 2050 to make the gas grids ready for energy transition: **ENTSO-G Roadmap 2050 for Gas Grids**
- The aim of the Roadmap is to provide recommendations and proposals on how to effectively combine well-functioning, **liquid gas market** and achieved effective **security of gas supply** with the commitment to **decarbonize**.
- This Roadmap offers three possible pathways forward on how to achieve net-zero greenhouse gas emissions by 2050 with gas grids:
  - Methane Pathway.
  - Blending Hydrogen and Methane Pathway.
  - Hydrogen Pathway.

This project is funded by the European Union

ENTSO-G Vision on Transmission Innovation

ENTSO-G sets out seven strategic lines of action for gas transmission innovation and decarbonization:

1. Market development
2. Principles for New Gases Transportation
3. Guarantees of Origin (GO).
4. Sector Coupling
5. Regulatory Sandbox
6. European Gas Quality
7. Principles for CO2 transportation

Source: ENTSO-G Roadmap (2020) for gas grids

This project is funded by the European Union

ENTSO-G Roadmap for gas grids

1. Market development.

Based on the following principles:

- Aim for existing **gas legislation** to **include hydrogen** and strengthen the role of **biomethane.**
- Include in **TSOs' services** and establish the **principles for reasonable remuneration** of services related to new gases: blending, conversion, flow management, digitalization and data provision, providing the flexibility for energy system.
- Continue to **trade** biomethane, hydrogen and natural gas based on **energy content**.
- Document and **track climate value** of a given source of gas.
- A trustworthy **EU-wide GOs/ certificate** system should be established

This project is funded by the European Union

ENTSO-G Roadmap for gas grids

2. Principles for New Gases Transportation

The **integration of renewable gases and H2 in traditional gas networks** will prevent market fragmentation. Benefits of TSOs managing hydrogen pipelines would be:

- **Infrastructure optimization and cost savings** as a result of coordinated planning (e.g. blending and/or dedicated pipelines; full/ partial conversion to hydrogen of existing pipelines etc.).
- **TSOs may own and operate P2G as conversion facilities** without ownership of commodity on a TPA basis according to market nominations
- Ensuring **non-discriminatory TPA regime** for market players to the hydrogen network.
- Guaranteeing viability of pipelines in development stage, as load factor progressively increases.

3. Guarantees of Origin (GO)

- Development of **national registers and the cross-border trade** of biomethane and hydrogen certificates among the member registries by establishing a **European GOs/ certificates**.

This project is funded by the European Union

ENTSO-G Roadmap for gas grids

4. Sector Coupling.

- A Hybrid Energy System building on the regional strengths of existing energy infrastructure, will also **require EU-wide principles for Sector Coupling.**
- The **legislative framework** for sector coupling has not been integrated in the legislation so far.
- Present market conditions do not seem to support sufficiently an up-scaling as commercial activities needed for optimizing gas and electricity infrastructure functioning.
- **ENTSO-G finds that TSO ownership of P2G facilities should be considered** – as a way socializing costs as well as ensuring third-party access to such infrastructure.
- **P2G could be considered as conversion facilities** – converting from the electricity system to the gas system – as system activity, like LNG terminals..

This project is funded by the European Union

ENTSO-G Roadmap for gas grids

5. Regulatory Sandbox

According to ENTSO-G the current market framework does not provide sufficient incentives for innovation and recommends:

- Accept the **framework concept of regulatory sandbox**: under supervision by the NRAs, TSOs can develop R&D and pilot decarbonisation projects.
- Provide enough regulatory framework to **facilitate investment allowing for flexibility/freedom from general EU rules** (i. e. state aid, funding access criteria, ownership unbundling, cost socialisation via Regulated Asset Base) under regulatory oversight.
- Assess gas decarbonisation technologies for maturity and necessity **for support under R&D friendly framework**
- Establish Regulatory Sandbox guidelines to offer some regulatory **flexibility for TSOs' pilot projects** and clarity for NRAs for cost allocation in technology incubation/roll out phase.

This project is funded by the European Union

ENTSO-G Roadmap for gas grids Regulatory Sandbox

This project is funded by the European Union

ENTSO-G Roadmap for gas grids

6. *European Gas Quality.*

- The European Gas TSOs have experience and knowledge in handling **gasses from different sources**.
- With decarbonization and **increasing shares of hydrogen and biomethane** in the system, the **handling of differing qualities** becomes even more important and challenging.
- The handling of the diverse gas qualities should go hand in hand with maintaining and developing the achievements of **integrating the European gas market**.

7. Principles for CO2 transportation.

- An efficient and sustainable approach to decarbonization will include **carbon capture, utilization and storage** (CCUS) which, besides storage, will require **CO_2 transportation** systems in regions where needed.
- Principles for CO_2 transportation should address how to **ensure efficient and safe transport** and management (logistics and economics) of CO_2 from emitting locations to storage or usage locations.

This project is funded by the European Union

ENTSO-G Innovative Project Platform

This project is funded by the European Union

ENTSO-G Innovative Project Platform I

ENTSOG and its Members (TSOs) have created a **public platform for communication and exchange of best practices** applied at national level . These innovative solutions focus on biogas, power to gas, hydrogen, CNG and other innovative applications to support the achievement of the current EU goals of reducing GHG emissions.

It is interesting to take a look at which type of projects are considered as innovative by ENTSOG:

Innovation Area	Sample Projects
Technology Optimization	• **Hydrothermal gasification** (GRT Gaz, France) is a technology converting wet biomass and treating organic wastes and residues. The technology could reach industrial scale by 2023-25.
Regulation & business model	• ERGaR (Energinet, Denmark) is founded as a cooperation between European registries of **biomethane certificates** that will enable cross border trade of biomethane certificates among the member registries. • Jupiter 1000 Teréga with GRTgaz (France) developed a **demonstration project for Power to Gas.**

This project is funded by the European Union

ENTSO-G Innovative Project Platform II

Innovation Area	Sample Projects
Partnership	• ENTSOG and its TSO members are engaging in partnership organisations to assess and create awareness about the role of renewable and *low carbon gas in the future energy system:* Green Gas Initiative, European Power to Gas Platform, Gas for Climate
Innovation & Transition	• TEP Energy Solution (Snam, Italy). Snam intends to *transfer of energy efficiency know-how* and technologies from large businesses to small and medium-sized enterprises and local institutions.
Carbon Capture and Storage	• Feasibility study of CCS in Ireland (GNI, Ireland). Investigating the potential for a large-scale CCS project in Ireland *to capture the CO2 from a number of gas-fired CCGT* power plants.
Hydrogen	• Testing of the H2NG supply in Contursi Terme (Snam, Italy). Snam has launched its experiment of introducing a *5% hydrogen and natural gas blend into the Italian gas transmission network*.

This project is funded by the European Union

ENTSO-G Innovative Project Platform III

Innovation Area	Sample Projects
Biogas	• RenovaGas (Enagás, Spain). Development of a 15 kW demonstration plant for the production of ***synthetic natural gas*** (SNG) from the electrolytic production of hydrogen with renewable energy sources (RES) and its combination directly with a biogas stream.
Power to gas	• Hybridge (OGE, Germany). The two companies are planning to trial the power-to-gas (P2G) technology on an industrial scale to help accelerate the energy transition. ***The aim is to build P2G plants in the 50 to 100 MW range.***
CNG	• The Causeway Project (GNI, Ireland). The Project will see the formation of a national ***Compressed Natural Gas (CNG) refuelling network***, a renewable gas injection facility and the deployment of a fleet of CNG vehicles.

This project is funded by the European Union

ENTSO-G Innovative Project Platform IV

Innovation Area	Sample Projects
Digitalisation	• NewGasMet: Flow metering of renewable gases (Enagás, Spain). Increase knowledge about the accuracy and ***durability of commercially available gas meters after exposure to renewable gases*** (biogas, biomethane, hydrogen, syngas and mixtures with natural gas).
Heating & Cooling	• I-GAP project (Snam, Italy). Small gas absorption heat pumps to offer an economically sustainable and easily integrated solution for ***heating residential buildings.***
Certification of green gases	• Vertogas certification agency (Gasuine, Netherlands). • ERGaR (Energinet, Denmark) • Green gas Guarantees of Origin (Amber Grid, Lithuania)

This project is funded by the European Union

Innovation Funding Mechanisms at EU Level

This project is funded by the European Union

ENTSO-G Vision on Transmission Innovation

There are several **funding possibilities in the energy sector at EU level**. European gas transmission companies may benefit from some of them for investments on innovative projects. EU funding possibilities in the energy sector are:

- **The Connecting Europe Facility (CEF)**. Under the CEF, €5.85 billion is available for trans-European energy infrastructure projects including gas pipelines, transmission grids, Liquefied Natural Gas (LNG) terminals, gas storage, and smart grids.
- **Horizon 2020 and Horizon Europe**. Around €5.9 billion goes towards energy research and innovation projects in the EU's Horizon 2020 programme.
- The EU's Cohesion Fund. The fund supports energy-related projects that benefit the environment.
- European Regional Development Fund. One of the ERDF's four priority areas for 2014-2020 is 'the low carbon economy'.
- The European Investment Bank (EIB). EIB financed energy projects include renewable generation, infrastructure, and new technologies.

Regarding gas transmission projects, most relevant funding mechanisms are the CEF and Horizon 2020 that are partially implemented by the Innovation and Networks Executive Agency (INEA).

This project is funded by the European Union

Thank You / Teşekkürler

26th August 2020, EMRA, Ankara