

Smart Sector Integration Strategy Roadmap

The European Hydrogen Valleys Partnership welcomes the Commissions Initiative to launch the Smart Sector Integration Strategy. Our partnership aims to strengthen the European green Hydrogen value chain by engaging regions in promoting the production of green Hydrogen via renewable energy sources and its use in different sectors such as energy transport as well as industry feedstock via the exchange of good practices and the set-up of concrete joint projects. The European Hydrogen Valleys Partnership therefore wishes the following points to be taken into consideration.

What would be the main features of a truly integrated energy system to enable a climate neutral future? Where do you see benefits or synergies? Where do you see the biggest energy efficiency and cost-efficiency potential through system integration?

In order to achieve a deep decarbonisation of the energy system, the EU will need focused action on integrating energy systems across electricity, gas, heating and cooling, transportation and energy-intensive industry sectors. This will increase the flexibility of the whole system, helping balance the fluctuations of renewable energy sources like solar or wind in a cost-efficient way while ensuring the highest degree of security in the energy supply. Taking this approach, the EU will accelerate the integration of more renewables into the grid, maximise emission reductions and reduce energy waste, hence improving the overall efficiency of the system. A truly integrated system will (have to) come about when the supply of renewable energy continues to rise and demand for final energy continues to fall. Maintaining and strengthening energy efficiency efforts while increasing supply of wind and solar power are paramount to achieving an integrated and carbon neutral energy system. More renewable supply and less final energy demand will support new technologies needed to match the renewable supply patterns with final demand in various sectors. Therefore there are synergies between offshore wind power generation and Hydrogen production. We plead for taking due account in any energy strategy for domestic production of renewable energy as well as for imports of renewable energy from third countries in order to achieve cost-efficient systems.

What are the main barriers to energy system integration that would require to be addressed in your view?

At present, there are certain barriers that are slowing down progress towards energy integration and hence the decarbonisation of the EU's energy system. For instance, the EU lacks clear and harmonized rules to ensure a smooth integration between electricity and gas infrastructures and markets (i.e. sector coupling). More concretely, to allow for the decarbonisation of the energy sector, EU regulators would need to address issues such as certification of origin for green gases or common standards to ensure compatibility of, for example, green Hydrogen production, storage and usage across the EU. Additionally, there are also pricing issues that are hampering the scale-up of green Hydrogen, which make them less competitive in the short term vis-à-vis other existing fossil fuel-based technologies. All these shortcomings should be addressed in the Smart Sector Integration Strategy, which should include plans for a new regulatory framework for decarbonized gases and an increased investment that unlocks their potential. Furthermore the following barriers are identified:

- The absence of a consistent certification system for renewable and green gases;
- Lack of dedicated infrastructure for renewable gases such as Hydrogen;
- Regulatory inability of the current gas infrastructure to accommodate significant amounts of renewable gases. Due to the required specifications of gas to be put into the gas infrastructure, adding renewable gases to the existing system is probably unnecessarily difficult;
- Finance. New technologies come at a cost that makes it difficult for them to enter the market competing with the existing fossil energy carriers. Scaling up is required to bring down costs. Significant financial support is needed to scale up technologies that are needed to make renewable energy carriers available in sectors that are hard to decarbonise.

What role should renewable gases play in the integrated energy system?

Renewable gases should play a key role in the promotion of an integrated energy system and thus the decarbonisation of the European economy. Among them, green Hydrogen technologies have proven useful in leading the way towards decarbonisation thanks to their big potential to reduce carbon emissions in a large number of applications such as energy-intensive industries, industrial and domestic heating and cooling, and transport. Moreover, renewable gases like green Hydrogen can help in storing renewable energy. While electric storage is helpful to shift consumption for short periods of time, renewable gases like green Hydrogen can provide a lower cost solution for the long-term storage of extensive amounts of intermittent renewable electricity, reducing the volatility of renewable energy generation.

What measures should be taken to promote decarbonised gases?

A fully-fledged EU framework should be established to incentivise the investment, production and deployment of decarbonised and renewable gases like blue and green Hydrogen. While the ultimate goal should be the deployment and upscale of green Hydrogen, the Commission should also advocate for an increased role for blue Hydrogen (clean Hydrogen produced from the reconversion of natural gas) in the short and medium term. Decarbonised gases like blue and green Hydrogen are essential to drive the energy transition in the EU and thus the Commission should enable the right framework to make use of their potential fully.

What role should Hydrogen play and how its development and deployment could be supported by the EU?

Because of its very nature, the development and deployment of Hydrogen is an opportunity for Europe to deepen decarbonisation and promote European innovation and competitiveness. No other emerging technology has the possibility or opportunity to support European efforts for a rapid decarbonisation across many different areas. Hydrogen technologies, but more specifically green Hydrogen, provides a safe and competitive zero-emission solution for a large number of applications in energy-intensive industries, industrial and domestic heating and cooling, and transport – all areas where current decarbonisation efforts have difficulty reaching the reduction targets. Hydrogen is also relevant because it stores large amounts of renewable energy, which is not always readily available, making the entire energy system more flexible and less dependent on weather conditions that could affect some key renewable sources like solar or wind. However, Hydrogen's promise is not only limited to a decarbonisation pathway but could also become a strategic, transformative industrial sector for Europe, boosting innovation, jobs, enhance growth, and promote competitiveness globally. Hydrogen can also play an important role in the Just Transition bringing many benefits in energy systems and citizens welfare. If the EU supported its development and deployment, starting first with the development of a specific regulatory framework for Hydrogen, together with increased funding, it could both accelerate the energy transition and enable the EU to meet its objectives as the world's first key innovator and climate action leader.

How can energy markets contribute to a more integrated energy system?

As supply of renewable energy rises and final energy demand falls, system services and technologies to bring renewable energy to all sectors will automatically get an economic market value. We ask for paying close attention to the market designs of power and gas markets in order to at the same time let the market do its job (i.e. finding the least cost options) while at the same time providing enough incentives for the development of new technologies. Relatively simple conditions can be imposed by regulation on energy markets, for instance a compulsory share of renewable gases in the natural gas networks. Market mechanisms will then find the least cost solution for providing those shares.

How can cost-efficient use and development of energy infrastructure and digitalisation enable an integration of the energy system?

We believe that the integration of the energy system can be enabled first by the adaptation and upgrading of energy infrastructure currently deployed for fossil fuels-based energy sources like natural gas. In particular, as blue Hydrogen can be produced from natural gas, already-existing natural gas infrastructures could be repurposed to convert and deploy Hydrogen. Repurposing the gas grid to transport Hydrogen would not only extend the useful life of the gas network itself, but it will also reduce potential costs for dismantlement and new construction. Where there is no possibility to adapt existing gas infrastructure, the EU should invest in developing dedicated infrastructure for renewable energy carriers.

Regarding digitalization, we believe this is pivotal in making energy systems more connected, efficient, reliable and sustainable. Digitalized energy systems may be able in the future to identify who needs energy and deliver it at the right time, in the right place and at the lowest cost. Moreover, digitalization can help integrate renewables by enabling grids to better match energy demand to times when, for instance, sun is shining or wind is blowing. This is highly relevant for production and usage of green Hydrogen coming from renewable electricity.

Are there any best practices or concrete projects for an integrated energy system you would like to highlight?

A clear example of an integrated energy system are the “Hydrogen Valleys”. This concept supports the development of Hydrogen projects in a given region or territory for a variety of applications involving all the segments of the value chain. Thus, it brings together all relevant stakeholders as well as regional and local authorities to develop an integrated Hydrogen system covering sectors such as transportation, industrial feedstock, building, heating and energy storage. Within the European Hydrogen Valleys Partnership, this concept has been brought into life by the Northern Netherlands Region. In 2019, the region received support from the FCH JU to develop a fully functioning green Hydrogen value chain in the region, called HEAVENN project, which has become the first recognized Hydrogen valley in Europe. This project will develop the entire green Hydrogen value chain in the coming years, from production to filling stations, thereby supporting sectoral integration; from large scale production of green Hydrogen as raw material for industry, as well as storage, transport and distribution of Hydrogen and its application for energy supply for both built environment and mobility. The main goal is to make use of green Hydrogen across the entire value chain, while developing replicable business models for wide-scale commercial deployment of Hydrogen across the entire regional energy system.

What policy actions and legislative measures could the Commission take to foster an integration of the energy system?

In view of the above, we call on the Commission to take the following actions in the coming months to foster the integration and decarbonisation of the energy system, with a particular focus on the gas market.

- **Review the EU’s gas market rules:** We urge the Commission to put forward its proposal to review the gas market rules in 2020/2021, also known as gas decarbonisation package. This package should include a detailed pathway to decarbonise the gas market, while providing a clear framework to enable further synergies between renewable gases and other sectors (i.e. sector coupling). More specifically, the new proposal should address the role of green Hydrogen in the EU – e.g. EU-wide certification for green Hydrogen, homogenisation of rules and standards. There should also be a transition plan to ensure that existing gas infrastructure is utilized and repurposed, if possible.
- **Integrate Hydrogen in the TEN-E Regulation revision:** The TEN-E Regulation is currently under review. This regulation provides a framework that addresses the identification of projects of common interest (“PCI”), which are key cross-border infrastructure projects linking the energy systems of EU countries that benefit from accelerated permitting procedures and EU funding through Connecting Europe Facility (CEF). In order to deliver on the 2050 climate target, the next TEN-E Regulation should prioritize and support smart and sustainable energy infrastructures and

technologies that will be key to deliver on that goal, such as Hydrogen networks, green gases, offshore wind and carbon capture storage and utilization, and energy storage. The existing infrastructure should be able to cater for higher shares of renewable gases.

- **Increase EU funding for the uptake and deployment of green gases:** In order to accelerate the development and deployment of a truly integrated energy system, more EU funding should be channelled to Hydrogen technologies, which have proven to be key enablers of further integration and decarbonisation of the system. The Commission should first double the Horizon Europe contribution to the European Partnership for Clean Hydrogen to incentivize the uptake of green Hydrogen and bring production costs down. Moreover, EU funding should also be used to foster the deployment and commercialization of green Hydrogen across the EU, stimulating the entire value chain of Hydrogen. This could be done via the Innovation Fund, CEF and Regional Funds. We also welcome a more flexible state aid approach through the Important Projects of Common European Interest (IPCEIs) framework in order to give some leeway to Member States to increase funding and support for green Hydrogen projects.
- **Ensure the involvement of regional and local actors:** The European Hydrogen Valleys Partnership welcomed the European Commission's initiative to launch a new European Clean Hydrogen Alliance in order to accelerate the decarbonisation of Europe's industry. However, we as the European Hydrogen Valleys Partnership regretted the absence of European regions in this initiative. Therefore, we call on the Commission to ensure the full involvement of regional and local authorities in this initiative and future initiatives related to Hydrogen, since we can offer a first-hand experience on the ground as "testbeds" for the deployment of integrated energy projects involving green Hydrogen. We also have a proven investment record in all stages of the Hydrogen value chain, which uniquely positions us at the forefront of the development of an integrated, sector-coupled, and cross-border clean Hydrogen economy.
- **Use incentives and prices to stimulate decarbonisation:** The Commission should also discourage the use of fossil-fuel based energy carriers. To that end, we suggest the Commission to increase ETS prices in order to make "green" gases, and in particular Hydrogen, competitive vis-a-vis other technologies like natural gas or grey Hydrogen. The EU could also use green taxation to stimulate the usage and production of green Hydrogen.
- **Support member states in implementing article 32.1 of the Directive on common rules for the internal market for electricity** by supporting/incentivizing power-to-gas (H₂) pilot projects to show the effectiveness and efficiency of this measure. The Directive on common rules for the internal market for electricity is a guideline. A "directive" is a legal act that establishes a specific objective that all EU countries must achieve. But they are free to legislate to achieve that goal. In contrast to "regulation" which is binding. It may be, for example, that Member States believe that local flexibility should only be achieved with storage in electric cars or other batteries. Then there is no longer any question of system integration and the role of Hydrogen becomes insignificant. This is very unfavorable for the entire system and its costs.