

Fortum Group's position on the regulatory framework needed to speed up the development of a European hydrogen economy

EXECUTIVE SUMMARY

To support the demand for renewable and low-carbon gases in hard-to-abate sectors, the EU needs to take decisive steps in designing fit-for-purpose EU legislation to support the swift deployment of a hydrogen economy in line with the European Commission's ambitions. In our view, the following four areas of action are crucial to make this transition happen:

- 1) A consistent and well-coordinated EU regulatory framework** that supports the development of a competitive cross-border market and a pan-European network for hydrogen. The forthcoming legislation on EU gas decarbonisation should be the main instrument for this, complemented by the revision of RED II (REDIII) with due consideration to maintaining a flexible approach to business. Setting unnecessarily restrictive measures risks jeopardising the EU's hydrogen ambitions and sectoral integration goals.
- 2) Clear and consistent EU-wide definitions for hydrogen.** To meet the increasing demand with manageable costs, all forms of carbon-free electricity should be able to play a role in the production of hydrogen. Instead of classifying hydrogen using various "colour codes", the definition of sustainable hydrogen should thus be based on the carbon footprint of hydrogen. Such a threshold has been set as 3.4 tCO₂/eqtH₂ under the draft RED III and as 3.0 tCO₂/eqtH₂ under the draft Hydrogen and Gas Package. Power purchase agreements backed by guarantees of origin and stand-alone guarantees of origin of electricity should be used to define the renewable characteristic of hydrogen together with other forms of sustainable hydrogen.
- 3) Energy taxation fit for hydrogen.** Hydrogen is not within the scope of the existing Energy Taxation Directive (ETD), so rules for its taxation require clarification. This should be done as part of the upcoming revision of the ETD. The key issue is to define which part(s) of the hydrogen value chain will be subject to taxation. The Directive should allow member states to apply lower tax rates or exempt electricity used for the electrolysis process from energy taxation. Specific levies on top of the price of electricity used for electrolysis should be reduced to a minimum. The usage, transmission and distribution of sustainable hydrogen should be similarly subject to lower tax treatment.
- 4) Support mechanisms and incentives focused on EU hydrogen production.** To drive the demand for hydrogen, ambitious carbon pricing through the EU ETS is essential. However, as hydrogen technologies are not yet fully mature, support mechanisms are needed to speed up their deployment. Revised EU State Aid Guidelines should establish a common EU framework for hydrogen-related incentives and support mechanisms applicable in all member states. The focus should be on guaranteeing demand for sustainable hydrogen (e.g. competitive tenders and carbon contract for difference) together with incentivizing production.

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DETAILED COMMENTS**Hydrogen is an essential enabler of the decarbonisation of the EU economy**

To become climate neutral by 2050, Europe needs to transform its energy system, which accounts for 75% of the EU's greenhouse gas emissions. At Fortum and Uniper, we believe that hydrogen will play an essential role in this transformation.

In the energy sector, the gradual substitution of natural gas and other fossil fuels with hydrogen or hydrogen-derived fuels is important, especially in Continental Europe where gas and coal are still widely used in energy production. Substantial volumes of hydrogen will be needed in various end-use sectors, especially to decarbonise many industrial processes (e.g. the production of steel, chemicals, ammonia, and fertilisers), as well as heavy transport, and, in certain countries, also residential and commercial heating.

Hydrogen enables sector coupling, which substantially lowers the overall economic cost of decarbonisation. Hydrogen complements electricity in three main ways: firstly, hydrogen can provide TWh-scale seasonal storage capability for which electrical batteries are not suitable. Secondly, hydrogen has the potential to help the transmission of energy across Europe in the medium/long term¹, the importance of which is continuously growing with the higher penetration of intermittent power generation and the persisting electricity grid bottlenecks. Thirdly, hydrogen is an ideal fuel for providing the still-crucial flexibility in a fully decarbonised electricity system dominated by intermittent renewables.

The EU Hydrogen Strategy and the EU Strategy for Energy System Integration highlight the need for integrating various energy-producing and energy-consuming sectors, as well as for coordinating the planning and operation of energy systems. Hydrogen is thus rightly perceived as one of the key enablers in achieving the goal set by the Energy System Integration Strategy.

With this position paper Fortum and Uniper would like to share their views on the regulatory framework needed to make the hydrogen economy a reality in Europe.

A consistent and well-coordinated EU regulatory framework for hydrogen is required

To support the demand in renewable and low-carbon gases in hard-to-abate sectors, the EU needs to take decisive steps in designing fit-for-purpose EU legislation. We highlight the importance of establishing a coherent EU framework for its development, instead of a patchwork of different, and potentially even overlapping, legal instruments. The legislative proposals on EU gas decarbonisation should be the main instruments for laying the basis for an EU-wide hydrogen economy complemented by the revision of RED II with due consideration to maintaining a flexible

¹ The synergy provided to the transmission grid will not be reached until the medium/long term, so Fortum and Uniper would like to underline the need to continuously step up efforts in reinforcing the Nordic grid to avoid situations like the one experienced in Sweden in the SE2 and SE3 price zones in June 2020, which resulted in a significant reduction in transmission capacity.

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approach to business solutions². We recommend adopting a clear EU-wide definition for sustainable forms of hydrogen with a reference to a relevant CO₂ threshold, and we see the proposals made under the draft RED III and Hydrogen and Gas Package as a positive step. The tracking system to guide the CO₂ threshold should be aligned with the principles and functioning of electricity markets. Building hydrogen installations on the same site as an electricity production unit to be directly powered by it should remain a business option. However, having rules equivalent to direct connection as the only way of certifying hydrogen would be too narrow, putting the EU's overall hydrogen development ambitions in this area at risk.

Instead, power purchase agreements (PPA) backed by guarantees of origin (GoO) for electricity and stand-alone GoO should be used to define the renewable characteristic of hydrogen together with other forms of sustainable hydrogen.

Hydrogen should receive equal treatment when considering the multiplier effect in relation to other energy sources. Currently, direct electricity charging qualifies for four times the renewables target in the transport sector. The same should apply to hydrogen use.

Competitive cross-border hydrogen market and a pan-European hydrogen network are needed. We support the development of an open, competitive, and liquid cross-border market for hydrogen with development of "hydrogen valleys" right from the beginning. Our preference is to start by locating hydrogen projects at the industrial consumer sites first; the issue of network and transporting hydrogen over long distances would come only thereafter. Similarly, we support the planning and development of a pan-European hydrogen network that largely seeks to retrofit the existing gas infrastructure and follow its regulatory principles.

Investments in and operation of hydrogen production and storage assets should be based on market requirements and, hence, they should be owned and operated by market players. We call for the strict implementation of the unbundling principles and the prohibition of even limited derogations, because allowing regulated system operators to participate in the commercial business could result in overall higher system costs and would likely delay and distort pan-European competition on hydrogen projects.

All carbon-free electricity is needed in the hydrogen supply

We believe that hydrogen production based on electrolysis powered by fully carbon-free electricity will eventually be the main technology. However, low-carbon hydrogen will be a necessary solution in the interim, based on the understanding that there will not be enough green hydrogen available until 2050.

It is therefore crucial to ensure that all carbon dioxide-free electricity, both from new build and existing power plants, can contribute to the production of sustainable hydrogen and not

² Imposing requirements such as producing RES-based hydrogen only from new build RES and showing evidence of a matched consumption with RES production every 15 minutes places onerous obligations on businesses. Whilst motivated for accounting purposes, such rules are likely to severely hit investment efforts and thus jeopardise the EU's hydrogen ambitions.

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unnecessarily leave out business models and options to produce sustainable hydrogen cost-efficiently.

In our view, the development of a hydrogen market should be based on the carbon footprint of hydrogen (CO₂-emission threshold) and EU-wide certification, instead of categorising hydrogen into various “colour codes”. Complementarity of technologies is key to ensuring that hydrogen production will meet the increasing demand with manageable costs.

Furthermore, sector coupling also requires that the entire energy system should operate as a whole to allow the use of electrolyzers most flexibly; restrictions such as temporal or geographical requirements to produce hydrogen would hamper this objective. Advancing sector coupling requires that the flexibilities embedded in different assets are allowed in the market – for example, by allowing electrolyzers to run at high load factors when renewable electricity is plentiful in the market, without requiring a correlation between it and any particular generation asset.

The additionality³ approach may enter in conflict with EU stated objective of sector integration and the goal of attaining a high-level of operability across cross-cutting sectors whilst unduly limiting in time and volume the potential for EU domestic hydrogen production. Thus, we are concerned with the proposed extension of the additionality principle under the draft RED III to all end-uses of hydrogen. The principle should be reviewed in the light of the EU climate-neutrality goal. The EU legislation on hydrogen should not prescribe or exclude any business models needed to achieve this goal. Obligations to develop renewables should generally be placed on Member States rather than on a project-by-project basis for individual businesses. We consider it as central to assess the provisions foreseen in the Delegated Act on RFNBOs under the RED II and conduct an impact assessment to inform the risks of an extension of the criteria to further sectors.

Hydrogen transmission infrastructure and storage are key prerequisites

An important prerequisite for the development of a liquid hydrogen market is an adequate transmission infrastructure to allow the transportation of hydrogen from production sites to places of consumption. Germany, which is one of the biggest hydrogen consumers in Europe, has announced that they need to import hydrogen to meet their demand; the estimated need for hydrogen imports is over 76 TWh in 2030. Finland and other Nordic countries have a large potential to produce clean hydrogen and transport it to Central Europe, and therefore a transmission network from the Nordics could be an off-taker providing flexibility to the market. Hydrogen produced in the Nordics is cost competitive, thanks to the very competitive onshore wind production.

³ Additionality is a principle embedded in RED II in relation to the RES consumption share in transport to ensure that this consumption results in additional RES-E generation that would not have occurred otherwise between the consumer and other actors in the electricity market. This electricity consumption in transport should only be accounted with higher than average RES shares if, and to the extent that, the respective consumption increases the overall RES-E generation. It derives from this a number of accompanying measures such as a multiplier, the principle of not giving any support to these additional RES plants, and a temporal and geographical correlation between the electricity production unit and the fuel production in the case of transport fuels of non-biological origin.

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Simultaneously, there is also a need for appropriate hydrogen storage facilities, operated based on market principles and handled by market parties. The existence of storage is a prerequisite for the emergence of a true European hydrogen system that is able to serve different types of consumers and producers. Moreover, seasonal storage is also key to ensuring the integration of more RES in the system while ensuring security of supply.

In addition, infrastructure must be developed also on the end-user side, including refuelling stations, hydrogen-ready appliances, hydrogen turbines, and especially new applications in industrial sectors.

Policy measures should focus on incentivising EU hydrogen production while in general supporting the development of a global market for hydrogen

The EU Hydrogen Strategy includes a call for direct electrolyser investments of up to 40 GW in the EU's eastern and southern neighbourhoods, including Ukraine and countries in North Africa. We believe that a European hydrogen economy should be based on unrestricted market-based trading of sustainable hydrogen and derived products across the globe and imports and exports be allowed based on commonly agreed standards. However, to facilitate its offtake, EU policy measures should also focus on matching EU demand with sustainable domestic hydrogen production with due regard to performance in terms of cost-efficiency and reduced GHG emissions. In this respect, specific attention should be paid to the volumes of sustainable hydrogen that can be produced domestically in the EU, provided well-designed policies and incentives are in place. For example, the Nordics with vast untapped onshore wind resources and existing decarbonised power generation hold great potential for the production of most competitive electrolytic hydrogen.

For these reasons, while we fully support the development of international trade and cooperation especially with neighbouring regions which are important for reaching Europe's H2 targets, we believe that EU policy measures and public support should be predominantly directed at deployment that takes place within the EU.

Rules for the taxation of hydrogen need to be developed

A predictable tax environment is essential for the development of hydrogen technologies. A key issue is to define which part(s) of the hydrogen value chain should be subject to taxation. Double taxation must be avoided. In order to accelerate hydrogen development, taxes, grid fees, and levies on electricity used for electrolysis should be reduced to a minimum in the beginning.

Even after hydrogen is included in the scope of the Energy Taxation Directive, member states should have the option to apply a lower tax rate or exempt the consumption of CO₂-free electricity in production and storing of hydrogen from energy taxation. Similarly, on the demand side, it is crucial that the use, transmission, and distribution of renewable and low-carbon hydrogen are exempted from energy taxation or at least taxed at a lower rate. This would give industries and other sectors a clear incentive to decarbonise their processes.

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State Aid Guidelines should define incentives and support for hydrogen

Hydrogen technologies are not yet fully mature and commercial, so incentives and subsidy mechanisms are needed to speed up their deployment: for bridging the production costs of carbon-intensive and carbon-free hydrogen, as well as for consumption of carbon-free hydrogen in lieu of conventional, fossil alternatives, e.g. in mobility and industrial applications.

Therefore, hydrogen development needs to be taken into account in the revision of the State Aid Guidelines. The revised Guidelines should establish a common EU framework for hydrogen-related incentives and support mechanisms applicable in all member states. This framework should take into account technology-neutrality and unbundling rules. Aid covering in particular operating costs should be given specific attention, as this is where the main cost gap remains.

In addition, it is important to design subsidy mechanisms dynamically to ensure a fair balance between investment security for the investor and the lowest possible public costs.

EU ETS is an important driver for increasing hydrogen demand

Together with taxation and certification, strong carbon pricing based on an enforced and extended EU Emission Trading System, is an important driver for creating demand for sustainable hydrogen. A large part of the potential end-use sectors for hydrogen are already under the EU ETS.

We support the European Commission's proposal to extend the EU ETS to new sectors, like heating of buildings and road and maritime transport. We support a two-step approach for the extension: 1) establishing a stand-alone transitional trading system for the new sectors, and 2) after a trial period, a possible full integration into the ETS. This way, the new sectors would not disrupt and undermine the stability of the current ETS, even if their costs of emission abatement differ significantly from the ones in the existing ETS. Transitional arrangements would also allow for gradually setting up the required regulatory framework and administrative capacity.

In addition to a strong ETS, financial support for starting the hydrogen economy is needed. This support should especially aim at creating demand for sustainable hydrogen by competitive tenders, such as two-way Carbon Contracts for Difference (CCfD)⁴. CCfDs ensure that climate-friendly technologies can compete with conventional technologies. Especially for industrial sectors that compete globally, the competitiveness aspect needs to be taken seriously.

Nordic cooperation in hydrogen development will be important

In addition to Finland, also Denmark, Sweden and Norway are in the process of developing their national hydrogen strategies. While hydrogen development is at different levels, the Nordic countries, in general, are behind Continental Europe. A joint Nordic hydrogen strategy with a joint

⁴ Carbon Contracts for Difference (CCfD) are a support instrument aimed at transitioning industrial assets towards climate neutrality by covering the difference between the price of emissions allowances (EUAs) and the contract price. In other words, it is a form of support that rewards CO₂ emission reductions above the current price levels in the EU ETS and in doing so guarantees a carbon price for the project.

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target and aligned incentives would benefit the region as a whole, boosting clean energy exports and enabling a faster path towards carbon neutrality.

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About Fortum and Uniper

Fortum and Uniper form a European energy group committed to enabling a successful transition to carbon neutrality for everyone. Our 50 gigawatts of power generating capacity, substantial gas import and storage operations, and our global energy trading business enable us to provide Europe and other regions with a reliable supply of low-carbon energy. We are already Europe's third largest producer of CO₂-free electricity, and our growth businesses focus on clean power, low-carbon energy, and the infrastructure for tomorrow's hydrogen economy. In addition, we design solutions that help companies and cities reduce their environmental footprint. Our 20,000 professionals and operations in 40 countries give us the skills, resources, and reach to empower the energy evolution toward a cleaner world. www.fortum.com ; www.uniper.energy

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