

Vattenfall's view on European Hydrogen rules

Policy Paper

Create an enabling policy framework for Hydrogen uptake

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Hydrogen, produced from renewable energy, decarbonised gases or fossil-free electricity can play an important role in supporting the decarbonisation of society and economy, where direct electrification is technically not possible or not feasible.

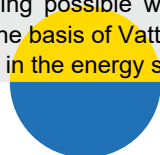
A European legislative framework is needed to streamline the willingness of companies to invest into the production of fossil-free hydrogen and develop a hydrogen value chain as well.

Specifically, we think:

- Clear **EU wide definitions** of the various types of hydrogen reflecting its renewable, low-carbon or fossil-free character are required;
- Clarification are necessary that the **existing European unbundling rules** are also applicable to Power-to-Gas installations and infrastructure and ensure that the development, operation and ownership of the facilities belong to non-regulated market parties;
- **Policy measures need to be developed** for the energy intensive industry to scale-up new, industrial decarbonisation technologies in a cost efficient way;
- The European Commission should include into its work on a **common European labelling system** the life-cycle CO₂-footprint of the end-product;
- A **sector integrated regulatory framework needs to be established**: addressing the existing barriers – network tariffs, levies and taxes on electricity and hydrogen – of every cross-sectoral electricity utilisation by all Power-to-Gas technologies;
 - Exemptions from **network charges** can stimulate the development of hydrogen economy;
 - European State Aid rules should exempt Power-to-Gas installations from paying **national environmental taxes and levies**;
 - European funding programmes are necessary to support the scale-up of the hydrogen economy and investments into decarbonisation projects and should also **cover operational costs**;
- Operators of a Power-to-Gas installation and network operators should **cooperate closely** together when deciding upon the **location of the electrolyser**;
- The European Commission should **conduct a study** to evaluate and compare the **costs of and need for a future hydrogen infrastructure** and build-out of the electricity transmission grid.

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Vattenfall is a European energy company with approximately 20,000 employees. For more than 100 years we have electrified industries, supplied energy to people's homes and modernized our way of living through innovation and cooperation. Our goal is to make fossil-free living possible within one generation. Everything we do and the decisions we take shall lead to this goal. This is the **basis of Vattenfall's strategy**, and we advocate for a regulatory environment that makes this transition possible – **in the energy sector and beyond in transport, industry etc.**



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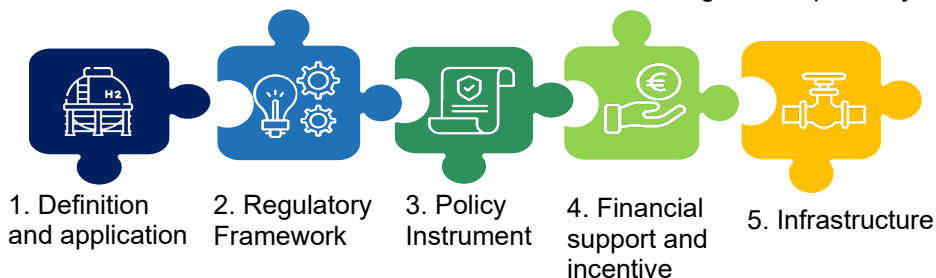
Background

The European Commission, as part of their Green Deal initiatives, published the Hydrogen Strategy and the Energy System Integration Strategy in July 2020, which both pave the way to develop the full potential of hydrogen to help the EU achieve a carbon neutral economy by 2050. Vattenfall establishes a number of partnership with (industrial) partners and initiates projects along the hydrogen value chain to decarbonize various sectors, where direct electrification is technically not possible or feasible. In order to stimulate the establishment of a European hydrogen economy and hydrogen projects to be successfully implemented, we see a need for regulatory support on certain aspects.

0. Introduction

Driving decarbonisation with our customers and partners is one of Vattenfall's key strategic areas to enable fossil-free living within one generation. Vattenfall looks beyond our own energy production towards other sectors, e.g. industry and transport, and promotes electrification as the most efficient way to decarbonize their operations and help those sectors to reach their ambition of becoming climate neutral. In industrial processes that are difficult to electrify, decarbonization can be driven by hydrogen from fossil-free electricity.

To enable the development of a hydrogen economy and the scaling up of hydrogen production and demand, a number of elements need to be addressed in EU legislation, primarily relating to:



1. Definition and application of Hydrogen

1.1. Hydrogen should be defined according to the energy sources and process emissions of hydrogen production

Clear definitions of the various types of hydrogen, referencing the route of production, should be commonly defined at EU-level in order to properly integrate them into the EU policy and the regulatory framework. Instead of making use of colours to distinguish between the various types of hydrogen, hydrogen should be defined according to its renewable, low-carbon or fossil-free character also reflecting upon the process emission of the hydrogen production.

1.2 Application of hydrogen

Vattenfall sees an important role for hydrogen in a number of applications in sectors facing significant decarbonisation challenges, especially where direct electrification is not technically feasible and where there is high potential for technical processes to move away from fossil-based towards fossil-free energy sources.

- When applying **Hydrogen as a transport fuel in fuel cells** for heavy, long-distance modes of transport that are not cost-competitive to electrify via the direct use of electricity as energy carrier;
- **Hydrogen as feedstock for energy intensive industries**, replacing carbon-based feedstock in industrial processes, e.g. the steel and chemical sector and refineries;
- **Hydrogen as provider of flexibility in the power system**, via the operation of highly flexible electrolyzers or via fossil-free electricity (and heat) production from highly efficient Combined Heat Power (CHP) and Combined Cycle Gas Turbines (CCGT) plants;
- In **district heating networks**, hydrogen fired boilers can serve as units serving peak demand, enabling a fossil-free heat supply together with other fossil-free heat sourcing.



2. Regulatory Framework

On an increasing basis, Transmission System Operators (TSO) for gas and electricity are looking into the opportunity of investing into Power-to-Gas installations. However, this technology belongs to the area of responsibilities of market participants. As it becomes clearer that Power-to-Gas facilities can play a role in accelerating the energy transition and providing flexibility to the electricity network, the European Commission should clarify that the **operation and ownership of Power-to-Gas installations belong to the domain of competitive non-regulated entities and existing European unbundling rules should be extended accordingly.**

As a general rule, TSOs and Distribution System Operators (DSOs) should refrain from becoming active in new business models in the framework of energy system integration, as these do not belong to the primary responsibilities and tasks of a network operator as described in European electricity and gas legislation. Interference by network operators will hinder the energy transition and make the eventual market less efficient / more costly. This is in particular the case if TSOs are allowed to put their investments into Power-to-Gas installations into the regulatory asset base and collect revenues via grid tariffs. The respective European legislation should clarify that network operators are not allowed to build, operate or own electrolyser facilities.



3. Policy instruments to scale-up hydrogen production and demand

Incentives for any type of decarbonization measure, including **Power-to-Gas technologies, are best achieved through ambitious CO₂ pricing in all sectors**, both at the European level through the EU ETS, as well as at the national level in the non-ETS sectors (e.g. buildings and transport).

3.1. Introduce policy instruments to stimulate and incentivise the production and demand of fossil-free materials to enter the market

The current CO₂-price is not sufficiently high enough for driving industrial break-through technologies in the early development stages. Other supportive policies are also needed along the whole value chain. For instance, Carbon Contracts for Difference (CCfD) can serve as a useful instrument to reduce the financial risk faced by projects and investors and have the potential to decarbonise certain energy intensive industries by covering the price difference between conventional and low-carbon technologies

Another important aspect to promote a growing market for fossil-free products is a **transparent and reliable labelling of the product's CO₂-footprint** that can help the consumer to make an active choice. This is particularly important in sectors with long value chains from raw material to consumer product. Considering the many different labels of green products that exist today there is a need for a labelling system that can be easily understood and widely accepted targeting the CO₂-footprint. The European Commission should include in its work on a common labelling system based the life-cycle CO₂-footprint of the end-product.



4. Financial support and incentives

In general, the EU regulatory framework should safeguard a level playing field for market oriented solutions to cost-efficiently achieve policy targets to support European economic prosperity and environmental protection. However, in the context of the energy transition, immature technologies are not always manageable by market forces only but need to receive public support based on an appropriate framework. Power-to-Gas installations face high OPEX costs and hydrogen and sector integration projects depend on public financial support to mitigate the financial risk by companies to invest into new breakthrough technologies.

4.1. Exemptions from network charges can stimulate the development of hydrogen economy

European legislation should enable national legislators and National Regulatory Authorities (NRAs) to stimulate the production of fossil-free hydrogen by, for instance, **exempting Power-to-Gas facilities of**

electricity network charges, for storing electricity remaining within their premises or when providing flexibility services to system operators.

It is necessary to amend **European Network Codes** for instance to accommodate fossil-free hydrogen by exempting Power-to-Gas installations from paying grid entry tariffs to the hydrogen infrastructure or storage facilities.

4.2. European legislation should exempt electrolyzers from being defined as end-users and facing levies and taxes at national level

The European State Aid rules should reflect upon the development of fossil-free hydrogen from renewable sources, which at the moment still faces high OPEX-costs, in particular environmental taxes such as national surcharges and levies. Thus, European State Aid rules should exempt Power-to-Gas installations from being defined as end-users in order to avoid national environmental taxes and levies.

4.3. Funding programmes are necessary to support the scale-up of the hydrogen economy and investments into decarbonisation projects

To position hydrogen technology as a partner to advance the energy transition and to enable decarbonisation projects, public support at EU and national level is required. Public support should aim to alleviate project risks and scale up the hydrogen economy to allow hydrogen to become an alternative and competitive energy carrier or feedstock and also allow for OPEX support.

EU funding programme should be extended to guarantee financial support, also being reflected by subsidies for operational costs of projects scaling-up the hydrogen economy and projects to decarbonise the industrial and transport sectors.



5. Infrastructure

Fossil-free hydrogen can be produced on-site or can be transported to the various demand centres using retrofitted natural gas pipelines. The transportation of hydrogen via pipelines can serve the purpose of bringing hydrogen to customers, as one option. Another option is that the transport of hydrogen could play a role in balancing the increasingly renewables-based electricity grid by transforming electricity into hydrogen that is transported via pipelines mitigating bottlenecks of the electricity grid and contributing to greater integration of the energy systems. The development of a future hydrogen infrastructure should involve all stakeholders and take the customers’ need for fossil-free electricity and hydrogen into consideration.

5.1. Planning on the location of electrolyzers should be evaluated by all involved parties and should not result in stranded-assets

Hydrogen can be produced and consumed locally, for instance on-site production of industrial customers. In those cases the need to connect the electrolyser to the gas grid becomes obsolete.

Hence, from an efficiency point of view and in order to avoid stranded assets, we should not assume that all electrolyzers need to be connected to the hydrogen infrastructure. A close cooperation between the owner/operator of a Power-to-Gas installation and network operators is necessary, on a case-by-case basis, when deciding upon the location of the electrolyser.

5.2. The European Commission should conduct a study to evaluate and compare the costs of and need for a future hydrogen infrastructure and build-out of the electricity transmission grid

Gas TSO are increasingly arguing that Europe’s existing gas infrastructure is suitable to transport hydrogen and it is cheaper to modify the gas pipelines or even building new hydrogen pipelines compared to the costs for building out the electricity transmission infrastructure. The costs of and need to repurpose existing and build new pipelines to transport hydrogen should be assessed and evaluated by the European Commission and compared to the costs for extending the electricity transmission grid.