Questions and Answers on the EU Delegated Acts on Renewable Hydrogen

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1. What is the Commission proposing today and what are the objectives of these rules?

Hydrogen plays a key role in our European Green Deal and in the REPowerEU plan. Upscaling the use of renewable hydrogen, ammonia and other derivatives will accelerate the decarbonisation of our energy system and greatly reduce the EU's dependence on Russian imported fossil fuels.

Defining now the conditions under which hydrogen can be considered 'renewable' is key to facilitate the scaling up of hydrogen production in Europe and ensure that hydrogen can fully contribute to the Fit for 55 and REPowerEU objectives. It is important to ensure that the increased hydrogen demand is supported by the creation of new renewable electricity generation capacities.

Today, the Commission has therefore adopted two Delegated Acts, as required under Article 27(3) of the Renewable Energy Directive (2018/2001), defining what constitutes renewable hydrogen for the EU. This will complement its work on an EU regulatory framework for hydrogen and interplay with other EU rules including on energy infrastructure and state aid, as well as the proposed consumption targets for renewable hydrogen for the industry and transport sectors contained in the Fit for 55 package.

In particular, the first Delegated Actdefines when hydrogen, hydrogen-based fuels or other energy carriers can be considered as a renewable fuel of non-biological origin, or RFNBO. The rules are to ensure that these fuels can only be produced from "additional" renewable electricity generated at the same time and in the same area as their own production.

The second Delegated Act sets the methodology to calculate GHG emissions savings from RFNBOs and recycled carbon fuels. The methodology takes into account the full lifecycle of the fuels to calculate the emissions and the associated savings. It also establishes that the greenhouse gas emissions savings from the use of recycled carbon fuels shall be at least 70%, compared to the fuels they are replacing.

2. What are RFNBOs and how are they linked to renewable hydrogen?

"RFNBO" means renewable liquid and gaseous fuels of non-biological origin. It is a product group of renewable fuels defined in the Renewable Energy Directive (Art. 2.36). These fuels are produced from renewable energy sources other than biomass. Gaseous renewable hydrogen produced by feeding renewables-based electricity into an electrolyser is therefore considered an RFNBO. At the same time liquid fuels, such as ammonia, methanol or e-fuels, are considered RFNBOs when produced from renewable hydrogen.

To date, RFNBOs are only considered as transport fuels to contribute to Europe's renewable energy targets if they are used as a transport fuel. However, the Commission proposed in its July 2021 amendment to the Renewable Energy Directive that RFNBOs should be counted towards Europe's renewable energy targets regardless of the end-use sector in which they are consumed.

Renewable hydrogen that is produced from biomass sources (such as biogas) is not considered to be an RFNBO, but is covered by the Renewable Energy Directive under the definition of 'biomass fuels'. Biomass fuels can already account towards Europe's renewable energy targets as long as they meet the relevant sustainability standards.

RFNBOs will only be counted towards EU's renewable energy target if they have more than 70% greenhouse gas emissions savings compared to fossil fuels, which is the same standard that applies for renewable hydrogen produced from biomass. The exact methodology to calculate the emissions savings of RFNBOs is set out in the second Delegated Act adopted today.

3. How will these rules ensure that there will be enough renewables for hydrogen production and the grid?

Hydrogen production is expected to ramp up over several years. While initially electricity demand for hydrogen production will be negligible, it will increase towards 2030 with the mass rollout of large-scale electrolysers. The Commission estimates that around 500-550 TWh of renewable electricity is needed to meet the 2030 ambition in REPowerEU of producing 10 million tonnes of RFNBOs. The 10Mt ambition in 2030 corresponds to 14% of total EU electricity consumption. This ambition is reflected in the Commission proposal for the EU's 2030 renewable energy target to be set at 45%.

Hydrogen is an energy carrier and not itself a source of renewable energy. Renewable hydrogen produced with electrolysers can therefore only be considered as renewable if it is produced from renewable electricity. Unless the electricity system is already largely decarbonised, it is crucial to match the electricity demand for hydrogen production with additional renewable electricity generation. If hydrogen production weren't matched by additional renewable generation, electrolysers' additional electricity demand could risk leading to increased fossil-based power generation.

The rules we propose set out specific criteria for hydrogen producers to prove that the electricity they are using is renewable, both in case their production installation is directly connected to a renewable-power installation and if the electricity is taken from the grid. For the latter, the Delegated Act provides several ways to demonstrate that the electricity used is renewable, including when demand is curtailed, and when a given bidding zone reaches a share of 90% renewable electricity in the electricity mix or the emissions intensity of the electricity is lower than a certain threshold. In those cases, it won't be necessary to add extra renewable power capacity to the grid to comply with the emissions savings requirement. In such zones, renewable electricity generation will already exceed demand during large spans of the year and hydrogen production can absorb excess renewable electricity which would otherwise be wasted. It remains important, however, to ensure that hydrogen production does not take place in hours when renewable electricity may remain scarce. The number of hours of hydrogen production is therefore limited in order to avoid production during hours where renewable electricity is in short supply and expensive.

The proposed framework also provides producers the possibility to prove that hydrogen is renewable if they can guarantee additional power production and ensure that production is both temporarily and geographically optimised vis-à-vis the production of the renewable electricity used. Entering into Power Purchasing Agreement with renewable power producers is for example a way for hydrogen producers to comply with principles of “additionality” under certain conditions.

4. When will these rules enter into force and start to apply?

The Delegated Acts will now be submitted to the European Parliament and the Council for approval. They both have 2 months to accept or object the Commission's proposal. Their scrutiny period can be extended, at their request, by two further months. They do not have the possibility to amend the Commission's proposals.

In general, the proposed rules are designed for an emerging market which needs to develop and establish itself. Today, there are around 160 MW of electrolysers in place and most of these are demonstration plants. The largest plant currently under construction is 20 MW. The EU hydrogen strategy targets 6000 MW of electrolysers powered by renewable electricity by the end of 2025.

To support the early scale-up of electrolysers, and taking into account the limited availability of unsubsidised renewable power generation in the near future, renewable hydrogen producers will have the possibility to sign long-term renewable power purchase agreements with existing installations as long as their electrolysers are coming into operation before 2028. The reason for this derogation is that the planning, permitting processes and installation of new additional renewable power takes time and could result in delays in the roll-out of electrolysers and limit the potential to create economies of scale.

In a phase-in period, renewable hydrogen producers are allowed to match the production of renewable power generation and their associated renewable hydrogen production on a monthly basis. In other words, renewable hydrogen producers can run their electrolysers at any hour as long as the total amount of renewable electricity consumed corresponds to the total amount of renewable hydrogen produced within that calendar month of the year. This will allow renewable hydrogen producers to deliver a constant stream of renewable hydrogen to their clients, especially in those cases where no hydrogen infrastructure or storage options are available yet.

The rules are then designed to become more stringent as the sector is expected to scale up. As of

January 2030, all renewable hydrogen producers, including those that have signed with existing renewable power generation plants, will need to match the electricity that they have purchased on an hourly basis. Member States who wish to do so can introduce the hourly correlation as of 1 July 2027, subject to notification to the Commission.

5. How do these rules take into account the full life-cycle of RFNBOs?

The proposed method for calculating life-cycle greenhouse gas emissions for RFNBOs takes into account emissions across the full lifecycle of the fuels, including upstream emissions, emissions associated with taking electricity from the grid, from processing, and those associated with transporting these fuels to the end-consumer.

The methodology also clarifies how to calculate the greenhouse gas emissions of renewable hydrogen or its derivatives in case it is co-produced in a facility that produces fossil-based fuels.

6. Is hydrogen produced from nuclear power considered "renewable" under these delegated acts?

The proposed delegated acts stem from the Renewable Energy Directive, under which nuclear is not listed among the renewable energy sources. As part of the Hydrogen and gas markets decarbonisation package proposed in December 2021 and currently being negotiated by the co-legislators, the Commission put forward a definition of low-carbon hydrogen, that is when it is derived from non-renewable sources and produces at least 70% less greenhouse gas emissions than fossil natural gas across its full lifecycle. Under the Commission's proposal, a methodology for assessing greenhouse gas emissions savings from low carbon fuels will be set out in delegated legislation by 31 December 2024.

7. Will these rules apply to imports as well?

The requirements for the production of renewable hydrogen will apply to both domestic producers as well as producers from third countries that want to export renewable hydrogen to the EU to count towards the European renewables targets. A certification scheme relying on so called "voluntary schemes" will be introduced to ensure that the producers in third countries adhere to the same criteria.

Member States are required to accept the evidence obtained from schemes that have been recognised by the Commission. This reduces the administrative burden for hydrogen producers as they are not required to follow different procedures in each Member State. To be recognised by the Commission, the schemes have to demonstrate that they are able to properly verify that the legal requirements applying for the production of renewable hydrogen have been correctly applied. To this end the schemes have to set out detailed certification procedures and documentation requirements the fuel producer have to adhere. Correct implementation is verified by independent third party auditors. Voluntary schemes have already been used for more than a decade for certifying biofuels and biomass worldwide. The schemes will now be able to extend their scope to renewable hydrogen given that the regulatory framework is ready.

For those criteria that cannot be implemented in third countries, for example the requirements to produce within the same bidding zone, the Delegated Act already provides guidance on how this criteria should be implemented.

8. Will the Delegated Acts impact EU financial support for renewable hydrogen?

By providing clear definitions and criteria, the two Delegated Acts adopted today will help channel EU funds towards renewable hydrogen as well as guide the approval of national state aid schemes. The EU has been supporting the production of renewable hydrogen through various tools so far, including the Innovation Fund, the Modernisation Fund, the LIFE programme, the Just Transition Fund and the European Regional Development Fund.

In addition, as part of the 'Fit for 55' package, state aid rules were already updated at the end of 2021 to allow for dedicated support for the production of renewable hydrogen. Under this updated regime, €10.6 billion of contributions by the Member States have been approved as two Important Projects of Common European Interest (IPCEI) on hydrogen. In addition, various Member States are developing competitive schemes to enable renewable hydrogen projects to be developed at least

cost.

Significant investments for the production of renewable hydrogen are also being channelled through the National Recovery and Resilience Plans. So far, more than €10 billion have been assigned under the Recovery and Resilience Facility, with €4.9 billion going through IPCEIs. Overall, 11 Member States have included measures dedicated, either partly or exclusively, to green hydrogen in their RRPs, while an additional 5 Member States have included measures dedicated only to the hydrogen economy more broadly. For the latter, investments in networks, mobility, and R&D&I, are of at least €2.7billion. Today's Delegated Acts therefore complete the guidance provided for the REPowerEU chapters of the plans and provide project developers with the legal certainty that their proposed projects will indeed result in the production of renewable hydrogen that can count towards the European renewables targets.

The proposed rules will also provide legal certainty for the renewable hydrogen project developers that are interested in the latest call for the EU Innovation Fund, where a dedicated budget of €1 billion is available for projects supporting renewable hydrogen and electrification in industry. In addition, the Innovation Fund will support fixed-premium auctions for renewable hydrogen production, starting from 2023, as announced in the Green Deal Industrial Plan. The first pilot auction has an indicative budget of €800 million. It will be followed by further auctions or other forms of support for hydrogen production, covering the EU domestic part of the Hydrogen Bank announced by President von der Leyen in her State of the Union address last year.

More recently the Commission has also allocated an additional €200 million for Hydrogen Valleys, as part of the REPowerEU. It also supports the work of the Clean Hydrogen Partnership to which it provided €1 billion under Horizon Europe, matched by the same amount from industry and research partners.

For more information

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