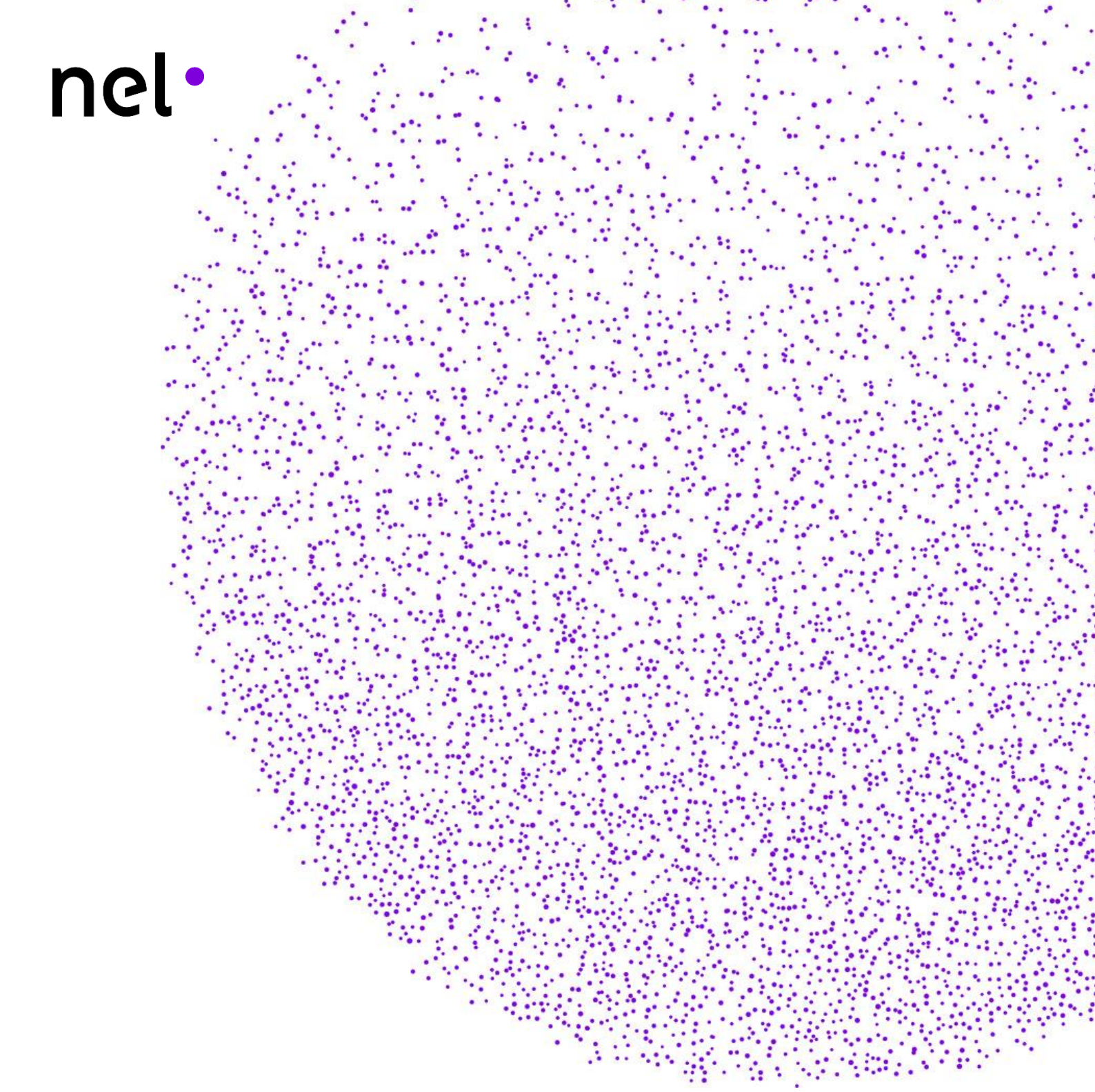


# Position Paper on Renewable Energy Directive Delegated Act on Renewable Fuels of Non-Biological Origin

Article 27.3

*Nel is a global, dedicated renewable hydrogen technology company, delivering optimal solutions to produce, store and distribute hydrogen from renewable energy. Today, our hydrogen solutions cover the entire value chain from hydrogen production technologies to refuelling stations. As the global leader in the manufacturing of electrolysers, we strongly believe that our technology is key to unlocking the potential of renewables & enabling global decarbonization.*

The European Commission's Hydrogen Strategy set ambitious targets for renewable hydrogen electrolyser capacity: 2x40 GW in 2030 and 6GW in 2024. We are determined to do our part to turn ambition into a reality. Nel has set a renewable hydrogen cost target of $1.5/kg by 2025[1] and is already working towards this, among other, by frontloading investment into the upscaling of our manufacturing capacities to enable a rapid increase in installed electrolyser capacity across the EU.

The current work being undertaken to develop the delegated act (DA) on the accounting of electricity from renewable sources used to produce hydrogen and hydrogen-based products in the transport sector (Art.27, RED II) is critical. We fully acknowledge that one of the main aims of the delegated act is to ensure that no fossil energy is used to balance renewable energy fluctuations or to circumvent grid congestions. Reaching climate neutrality and the objectives outlined in EU hydrogen strategy as well as RePower EU (20 million tons of renewable hydrogen by 2030[2]) will require significant investments in 'additional' renewable energy capacities, mass industrialisation of electrolysers and ultimately, the construction of new electrolyser manufacturing facilities at GW scale. As such, a pragmatic and workable regulatory framework is also vital for providing investor certainty and achieving the necessary scale up of electrolysers, while ensuring the continuity of European technological leadership and the emergence of a renewable hydrogen sector in Europe. Failure to deliver such a framework will not only jeopardise the 20-million-ton objective but also the rapid penetration of renewable energy across the energy system and the European economy. Within this context, we would like to put forward the following principles and proposals for your consideration.

## Phasing-in of requirements

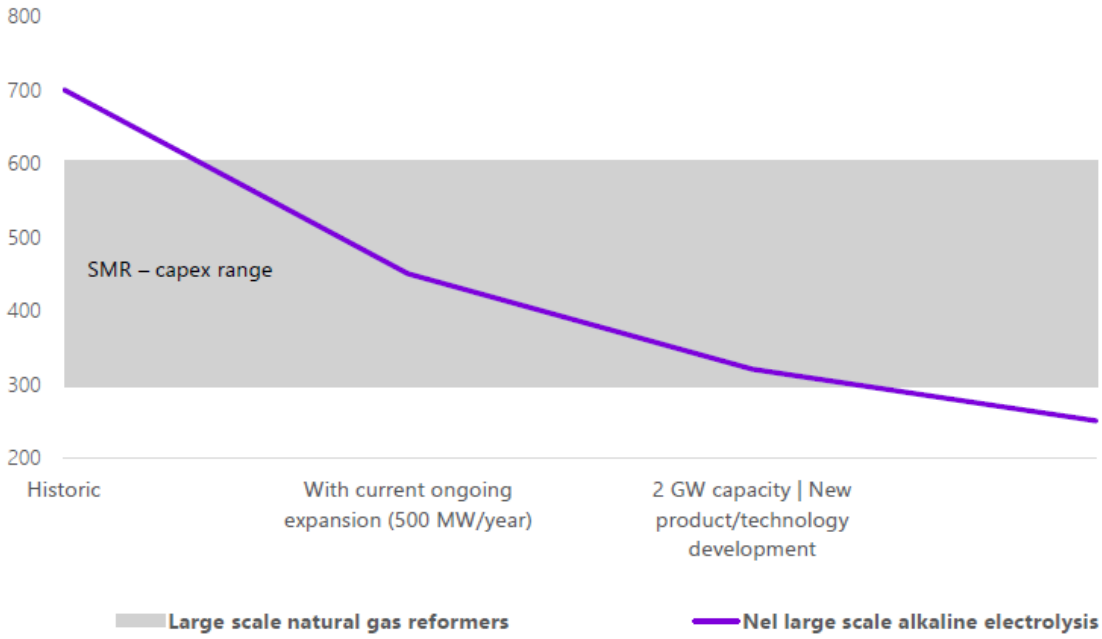
If we are to meet the first EU milestone of 6GW by 2024, we need to start upscaling manufacturing capacities now. This is key to bringing down CAPEX costs, a significant factor with regards to the overall costs of renewable hydrogen[3]. The quicker we can get electrolysers onto the market, the faster the renewable hydrogen industry will be able to arrive to fossil-parity or lower.

[1] Assumptions: Nel analysis based on electricity of 20 $/MWh, >8% cost of capital, cost of land, civil works, installation, commissioning, building water etc., lifetime 20 years incl. O&M cost, at 30 bar.

[2] 20 million tons of renewable hydrogen would equate to an estimated 240 GW of installed electrolyser capacity. Total electrolyser capacity required will vary due to several factors e.g., the size of the electrolysers deployed and their utilisation rate.

[3] 70-80% of the costs are linked to the cost of renewable electricity.

Capex of steam methane reformers (SMR) vs. Nel alkaline electrolysers $/kW [4]



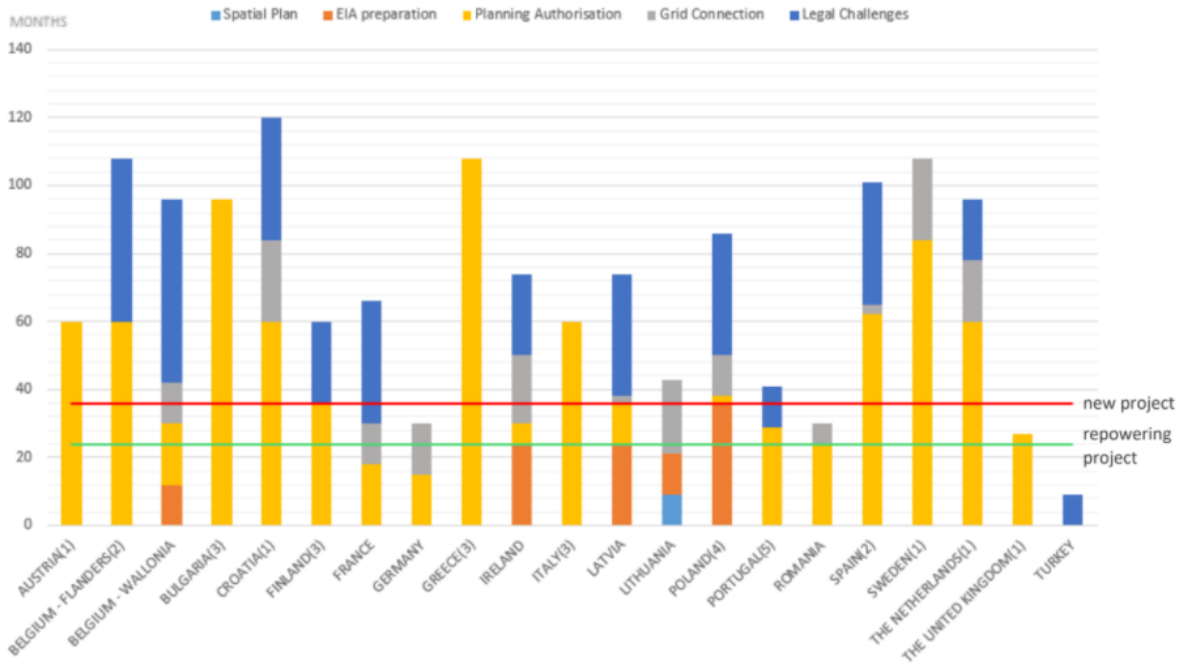

Allowing some flexibility in the short term by phasing-in requirements of the DA would enable the deployment and economic operation of the first-large scale CAPEX-intensive electrolysers and avoid significant delays in the uptake of these projects. Here are a few examples of issues that need to be tackled:

- The requirement to match the timing for the coming into operation of additional renewable energy installations with the electrolyser within 12 months is a sizeable challenge that risks endangering the ramp-up speed of manufacturing capacities and renewable hydrogen production. This is due to the significant time needed to plan and construct renewable energy installations as illustrated below.[5] Power purchase agreements should be considered as proof of renewable energy generation. Electrolysers should also be allowed to use renewable electricity from unsubsidised plants that would otherwise be decommissioned.

[4] Source: Company analysis and projections, hydrogen production plant excluding installation, civil works and building.

[5] This example is less applicable for solar PV where permits are granted much faster and projects can be built relatively quickly, even within a year.

Overview of national permitting rules and good practices for wind projects [6]




- At present, **hourly or daily temporal correlation is unproven using current technologies and established practices**. In the absence of technical and practical instruments to prove these short time intervals in Member States today, the DA should **define a phase-in period until such instruments become available**.
- With a shorter timeframe (hourly or daily temporal correlation), electricity prices will always be more attractive for direct electrification and would subsequently be detrimental to efforts being undertaken to upscale the market at speed and create a competitive market for renewable hydrogen. While market and political sentiment appears to favour electric vehicles and direct electrification, a broader view needs to be taken with regards to these criteria i.e., these rules will also be applied to industrial applications where direct electrification will not be able to provide solutions and other heavy duty transport applications and segments including trucks, maritime and aviation. During a phase-in period, **monthly temporal correlation should be considered**. This will give operators/traders the possibility to source electricity for electrolysers at more attractive prices from a wider range of sources.
- Longer accounting periods over which fluctuating renewable electricity generation and consumption by hydrogen producers are matched increase the utilisation of electrolysers and decrease costs (up to 1.2 €/kg for an annual compared to quarter-hourly accounting period[7]). **Long accounting periods ensure additionality** while the emission savings from shorter periods are unclear and likely to be only minor.

## A business model for curtailed renewable electricity

Electrolysers are perfectly suited for grid balancing and **enabling more renewables to enter the grid**. Electrolysers can provide flexibility services and have a significant impact in **lowering power system costs and optimising grid functioning**, thus contributing to **energy system efficiency**.

[6] Wind Europe, *Overview of national permitting rules and good practices*, July 2021, p.29
[7] Frontier Economics, RED II green electricity criteria
RED II green electricity criteria | Frontier Economics (frontier-economics.com)

- In Germany in 2020, an estimated €1.35 billion worth of offshore wind energy was curtailed due to insufficient transmission grid capacity.[8]

- In Great Britain, during the last 12 months (October 2020-October 2021), 2,5TWh of renewable electricity was curtailed at a cost of 172 million GBP. With replacement generation, the cost goes up. [9]

Yet today, there is **no clear legislative framework facilitating a business case for electrolysers to use curtailed renewable electricity**. Electrolyser owners would benefit from more flexibility here for the running of their electrolysers. With a view to avoiding future curtailment of renewable electricity, unnecessary costs on tax paying consumers and developing an efficient energy system that fully harnesses and unlocks the potential of renewables, **the delegated act should consider curtailed renewable electricity as additional**.

## Member States responsibility in proving additionality

The responsibility to prove that additional renewable energy capacities are being brought to the energy system should not be placed solely on prospective renewable hydrogen producers. The proposal for a revised renewable energy directive includes a higher overall renewable energy target for 2030 along with demand side targets for renewable hydrogen consumption both in industry and transport. This proposal moves in the right direction by placing responsibility on Member States to share responsibility in ensuring 'additionality' by meeting these targets. But **more can be done to reinforce the role of Member States in proving additionality requirements**:

- In the context of the *Hydrogen & Decarbonised Gas Package*, **Ten Year Network Development Planning (TYNDP) needs to be reformed** to ensure that hydrogen stakeholders are included in the process and that there is a proper scenario planning and mapping of where hydrogen demand is in each Member State and what infrastructure requirements are needed. **This relates directly to additionality and the need for additional renewable electricity infrastructure and hydrogen infrastructure** (electrolysers and pure hydrogen pipelines).

- Similarly, within the framework of the **EU Energy Governance Regulation, National Energy and Climate Plans (NECPs) should become more detailed**. Member State NECPs should outline their plans for hydrogen development and the related needs on the infrastructure side.

[8] Ökostromanlagen: Kosten für Abregelungen stiegen auf bis zu 1,34 Milliarden Euro - DER SPIEGEL
Accessed on 5 November 2021

[9] Energy Exemplar 2021