RFNBOs - Renewable Fuels of Non-Biological Origins

Eurelectric reaction paper

January 2021

Eurelectric represents the interests of the electricity industry in Europe. Our work covers all major issues affecting our sector. Our members represent the electricity industry in over 30 European countries.

We cover the entire industry from electricity generation and markets to distribution networks and customer issues. We also have affiliates active on several other continents and business associates from a wide variety of sectors with a direct interest in the electricity industry.

We stand for

The vision of the European power sector is to enable and sustain:
- A vibrant competitive European economy, reliably powered by clean, carbon-neutral energy
- A smart, energy efficient and truly sustainable society for all citizens of Europe

We are committed to lead a cost-effective energy transition by:

investing in clean power generation and transition-enabling solutions, to reduce emissions and actively pursue efforts to become carbon-neutral well before mid-century, taking into account different starting points and commercial availability of key transition technologies;

transforming the energy system to make it more responsive, resilient and efficient. This includes increased use of renewable energy, digitalisation, demand side response and reinforcement of grids so they can function as platforms and enablers for customers, cities and communities;

accelerating the energy transition in other economic sectors by offering competitive electricity as a transformation tool for transport, heating and industry;

embedding sustainability in all parts of our value chain and take measures to support the transformation of existing assets towards a zero carbon society;

innovating to discover the cutting-edge business models and develop the breakthrough technologies that are indispensable to allow our industry to lead this transition.

Dépôt légal: D/2021/12.105/3

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Eurelectric Reaction paper on RFNBOs

The power sector is committed to deliver carbon neutral power supply well before 2050 and to make a key contribution to the decarbonisation of transport, buildings and industry through electrification.[1] Eurelectric support the ambition of net-zero greenhouse gas (GHG) emissions in the European economy by 2050 and at least 55% target of GHG emissions reduction by 2030 as proposed by the Commission.[2] In hard-to-abate sectors, the productions of E-fuels and Renewable Fuels of Non Biological Origin (RFNBOs) will be needed to get rid of GHG emissions.

A 2030 RES target which applies to the entire economy allows for a competitive development of renewables across sectors. In this context, adding renewable sub-targets in other sectors beyond transport may not be the most cost-effective approach: increasing the overall RES target at EU level to reflect a higher GHG emission target for 2030 would be a preferable approach to encourage the development of both electric RES and the production of renewable and low carbon fuels for various hard-to-abate sectors.

For the EU to achieve its 2030 targets and carbon neutrality by 2050 long term signals are needed for investors to accelerate the development of renewables and low carbon technologies. For instance, a meaningful and predictable CO2 price signal combined with competitive tenders and revenue stabilization mechanisms will lead to efficient energy solutions for each sector and each specific application.

Transport decarbonisation will be largely driven by electrification and we see 96% of passenger vehicles, 48% of trucks and 58% of buses being electrified by 2050.[3] Other fuels such as hydrogen will complement these efforts in harder-to-abate segments and the production of E-fuels and RFNBOs will be needed to cut emissions. Renewable and low-carbon hydrogen are not cost-competitive against fossil-based hydrogen yet.[4] To fill this gap the EU needs to ensure that a great number of electrolysis projects are launched in order to gain industrial know-how and quickly reduce costs.

Article 27 of RED II intends to adopt a delegated act to determine the renewability of electricity used to produce RFNBOs. In light of this, Eurelectric would like to stress the importance to guarantee both the renewable origin in a clear and transparent manner and enable the scale up of renewable hydrogen production and E-fuels as anticipated by the Commission.[5] Specifically on additionality and temporal-geographical correlation requirements with RES production, the methodology being developed should ensure a sufficient level of flexibility to avoid putting additional burden, costs and barriers to the development of RFNBOs at scale.

[1] Two-thirds of electricity generation in the first half of 2020 was carbon-free, as shown in this year's edition of the Power Barometer

[2] Eurelectric, Stepping up Europe's 2030 climate ambition, December 2020

[3] Eurelectric, Decarbonisation pathways study, 2018

[4] European commission, A hydrogen strategy for a climate-neutral Europe, July 2020

[5] As the European Hydrogen production is still largely produced from fossil fuels, the European Commission has set out key milestones to develop clean hydrogen – installing at least 6GW of renewable hydrogen electrolysers in the EU by 2024 and 40 GW of renewable hydrogen electrolysers by 2030.
https://ec.europa.eu/energy/sites/ener/files/hydrogen_strategy.pdf

Key messages

In this context, Eurelectric would like to highlight the following elements to the Guidehouse consultancy and the Commission:

- **Additionality in the long-term**: Additionality means that the electrolyser should use *new* renewable electricity, rather than deviate existing capacity. But it should not discourage investments or lower the value of existing electricity production. Criteria defining additionality must assess the contribution to the deployment of renewable energy and prioritise an optimised integration of renewable energy in the long run.

  The biggest challenge in the additionality requirement is that the times to build renewable electricity generation assets are significantly longer, mainly because of the permitting process for renewables.[6] **This creates the risk of having electrolysers ready and not allowed to produce RFNBOs until the corresponding additional RES are built thus creating a very significant risk for investors.** Until new renewable electricity capacity is installed thanks to streamlined permitting processes, Eurelectric proposes a transitional phase-in of the additionality requirement.

- **Reliable and incentivising criteria:** temporal and geographical traceability of an electron is not possible in an interconnected electricity network. It has justified the use of contractual arrangements to supply renewable electricity. The methodology defined in the delegated act must remain in the scope of what is required by article 27(3) of RED II and prevent any additional administrative burden to project developers. The experience of the power sector shows that the use of small matching timeframes as well as the identification of congestion zones would be challenging and cause major constraints. In the short term, default methodologies relying on available data can be used to meet the temporal and geographical conditions. More specifically, temporal correlation can be guaranteed through daily, monthly or yearly matching. Bidding zones can be used to demonstrate geographical correlation.

- **Flexibility:** as suggested by Guidehouse, it should be possible to combine cases 1, 2 and 3 on the same RFNBO installation in order to allow for an economic use of the electrolyser.

- **A manageable transition:** Overall, a transitioning period will be needed to adapt to the requirements outlined in article 27(3) and meet the objectives of the European Commission to develop clean hydrogen and e-fuels.

[6] Eurelectric, RES Permitting, October 2020

Specific comments on the cases

Case 1: average grid electricity

Case 1 is out of scope of the delegated act and can already be transposed in national laws by Member States. By default, when electrolysers are fed from the grid, Article 27 states that "*the average share of electricity from renewable sources in the country of production, as measured two years before the year in question, shall be used to determine the share of renewable energy*."

Eurelectric would nevertheless like to make the following remarks:

- The case is simple to apply but in **Member States with a low share of renewable in the electricity mix, hydrogen and e-fuel producers will have nearly no interest in this case**, because only a small part of their production will be considered to be RFNBO: their eligibility to incentive measures and/or financial public support to increase renewable energy in the transport sector will be restricted, and probably insufficient to make their business case profitable.
- As underlined by Guidehouse, the effectiveness of this methodology **will depend on the provision of timely and reliable data**, which can be an issue in some regions. In addition, the implementation of case 1 would be difficult when hydrogen is produced outside of the EU. **There is therefore a risk to miscalculate the share of RFNBOs in imported hydrogen/e-fuels, and to introduce unfair competition with European production**. In the context of the recovery, and of the EU ambition to become a global leader in hydrogen, **it is critical to ensure a level playing field between producers, within and outside the EU**, also taking into account the GES emissions of the transportation of hydrogen/e-fuels. Eurelectric agrees with Guidehouse that **hydrogen/e-fuels imports are not explicitly tackled in RED II and out of scope of Article 27, and therefore should be left out of the delegated act.**

Main recommendations for case 1 – average electricity grid
➢ Guarantee a level-playing field between Member States to incentivise the deployment of renewable and low-carbon hydrogen and e-fuels. ➢ Ensure that reliable data is available ➢ Keep hydrogen/e-fuels imports out of the scope of the delegated act, additional analysis is required.

Case 2: direct connection

Case 2 allows to count as fully renewable the electricity supplied from a direct connection between a RES-E plant and the asset producing RFNBOs. Article 27(3) does not forbid the existence of grid connections but distinguish between situations.

> *"Electricity obtained from **direct connection to an installation generating renewable electricity** may be fully counted as renewable electricity where it is used for the production of renewable liquid and gaseous transport fuels of non-biological origin, provided that the installation:*
>
> *(b) is not connected to the grid or is connected to the grid but evidence can be provided that the electricity concerned has been supplied without taking electricity from the grid."*

To be successful, the methodology requires flexibility for grid connection arrangements and as discussed with Guidehouse, **the delegated act should foresee the possibility to combine cases 1, 2 and 3 on the same RFNBO installation in order to allow for an economic use of the electrolyser (high running hours):** electricity withdrawn from the grid should be characterized following case 1 or case 3, while the criteria of case 2 should be fulfilled by the electricity taken from the RES-E plant(s) to which the electrolyser is connected. **This could rely on special metering arrangements, to physically distinguish the flows, and have separate measurements, as suggested by Guidehouse.**

Eurelectric would like to particularly highlight that **real time temporal correlation criteria would be burdensome** and is not clearly indicated in article 27 as a criteria securing the renewability of the electricity: the RES-E installation shall "*comes into operation after, or at the same time as, the installation producing the RFNBO".* More specifically, the proposal to impose a 15-minute time-scale between the production of the RES-E plant and the production of the RFNBO plant would introduce massive constraints. Such small timeframe is not necessarily suited for the case:

- In the case of isolated direct connection, the installation of a storage capacity (either a battery or a hydrogen storage capacity) will be needed to tackle the intermittency of the RES, which is a major constraint.
- In case either the RES-E plant or the electrolyser is also connected to the grid, by definition, the real time matching between RES-E plant and the electrolyser is irrelevant since decoupling those two is precisely what is sought after, in order to optimize the economics of both installations.

Main recommendations for case 2 – direct connection
➢ Case 2 is a 'fast track' solution to guarantee the renewable character of hydrogen/e-fuels when the electricity is taken from the RES-E plant(s) to which the electrolyser is directly connected. It should be possible to combine the cases on the same RFNBO installation, using case 1 or case 3 for the electricity that is withdrawn from the grid. ➢ The small timeframe, which is required to prove the alignment of the RFNBO and RES-E installations, would introduce massive constraints.

Case 3: renewable grid electricity

This case allows to account as fully renewable the electricity taken from the grid under a list of criteria which have been interpreted by Guidehouse.

This approach suggests that the evolution of electricity demand from the transport sector is not taken into account by Member States when they build their renewable production capacity trajectories in order to balance electricity supply and demand, while the target for renewable market share is expressed in percentage of the total energy consumption. This means that if electricity demand increases due to new technologies such as electrolytic hydrogen, Member States should make sure that enough renewable capacity is built, to keep up with the decarbonisation of the electricity system and with the current overall objective of 32% of renewable in 2030 energy consumption or a revised target later on.

The rationale behind the temporal and geographical correlation constraints is to emulate a physical traceability of the electron which is, by definition, impossible in an interconnected and meshed electricity network. This is what justified the implementation of the electricity GO system, with **a book and claim principle which does not put at risk the internal electricity market integration**.

The book and claim system guarantees that a certain quantity of renewable electricity production has been injected into the grid, to match the same quantity of electricity withdrawn by a user at another point of the grid.

Eurelectric does not agree with Guidehouse when they say that GOs are not sufficient to demonstrate the renewable attribute of the electricity consumed by electrolyzers, when it is a sufficient proof to prove that offers are green for any other consumers according to Article 2. And Article 19 of RED II.

As regards the 4 conditions presented by the consultants, Eurelectric would like to share the following considerations:

1. Sourcing renewable electricity. Eurelectric supports all 4 options proposed by Guidehouse for the **contractual arrangements to supply renewable electricity**: unbundled GOs, bundled GOs, physical PPA, financial PPA. And it should be possible to combine these 4 options for the same RFNBO plant, and to have other options as well.

2. Additional renewable electricity. As explained above, the additional requirement must be carefully designed in order not to discourage investments in renewable hydrogen production via electrolysis and take into account the fact that a renewable electricity generation asset takes more time to be built. The interpretation suggested by Guidehouse is a good first step but **the commissioning date of the RES-E is not entirely relevant to prove the additionality**. An RES-E could be subsidized even though it is commissioned at the same time or after the electrolyser. And if the RES-E plant's electricity is fully dedicated to the electrolyzer through a PPA and does not receive any subsidy, but comes in operation before the electrolyzer, it would not fit any of the cases although it may well be additional.

There is no robust methodology to calculate the volume of "**uncurtailed RES**". It would also be very difficult to find a clear justification to allocate this "uncurtailed RES" to a specific hydrogen/e-fuel producer if this volume is insufficient to satisfy the demand of several producers. Avoiding RES curtailment should not play a part in the determination of the renewable character of RFNBOs. It rather constitutes additional revenue streams for hydrogen producers who are successful in securing a service contract with electricity TSO/DSOs to supply services to the system. These revenue streams are very uncertain and may be limited, depending on the competitiveness of other flexibility suppliers (battery, hydro plants, DSR).

3. Temporal correlation. In order to prove the alignment between the consumption of renewable electricity and the production of RFNBOs, **daily, monthly or yearly matching should be considered.** In addition, the electricity consumed to produce hydrogen/E-fuels should always be fully covered by the same quantity of GOs/PPAs, failing to apply this principle would be detrimental to the hydrogen/e-fuel industry's credibility.

- It should be sufficient for the PPAs to be based on day-ahead forecasts. This means that every hour is matched for production and consumption and used for determining the amount of renewable hydrogen produced. This is because day-ahead forecast is of good enough accuracy to guarantee that the production of hydrogen takes place at the same time as renewable electricity is produced in the assets contracted with the PPA. At the end of the year, depending on whether more or less power has been used, surplus should be removed and "residual" hydrogen should be accounted as renewable using the methodology of case 1.

- With the current European electricity GO system, it is not possible to implement a full intraday matching, because the production periods of certified batches of renewable electricity are not harmonized[7], and the GO validity period is equal to 12 months. **More work is needed to implement matching on shorter timeframes like daily or intraday**, and this will most certainly require a revision of RED II to harmonise the requirements between Member States, since GOs can be imported and exported from one Member State to another.

In the short term the following options would be possible:

- Contracted asset(s), monthly/yearly matching. Yearly matching corresponds to current practice with PPAs
- Any RES-E unit(s), monthly/yearly matching

The move toward a monthly settlement should be enforced only if the GO system allows it, and also taking into account the additional constraints in case electricity GOs are auctioned.

4. Geographical correlation. The requirement is already described in Recital 90: "*fuels can be counted as fully renewable only when both the electricity generation and the fuel production plants are located on the same side in respect of the congestion.*"

A congestion is a situation where a physical limit of the system (in relation to voltage, intensity…) makes it impossible to transport electricity on a certain line or path. **But there is a difference between occasional congestions, which happen rarely and have short durations, and structural congestions, which are frequent and tend to las**t. Furthermore, it is important to bear in mind that the place of congestions can change over time, that detailed data on congestions is currently not available, and that the absence of congestion does not necessarily mean that the electricity consumed by the electrolyser comes physically from the RES plant.

As a consequence, the methodology should focus on stable congestions, i.e. structural bottlenecks. They generally define the electricity market's bidding zones and are identified by ACER based on the ENTSO-E Bidding Zone Configuration Technical Report. This means that normally the geographical correlation requirement would imply that both the renewable electricity generation asset and the electrolyser would be located in the same bidding zone, and as long as that is true, the requirement is fulfilled.

However, there are some cases where important and stable congestions might not always follow the bidding zone splits. National regulatory authorities shall in the cases where the electrolyser would not be on the same side of the congestion but still help the grid, have the power to grant approval as an additional step to guarantee the renewability of the RFNBO produced.

[7] According to article 19.7(a), a GO specifies the energy source from which the energy was produced and the start and end dates of production. There is no specific requirement on these start and end dates, meaning this period of production could encompass several months.

Main recommendations for Case 3 – renewable grid electricity
➢ The additionality requirement must be carefully designed to guarantee credibility, encourage investments and avoid distortions on the internal market of hydrogen. ➢ In the short term, the temporal alignment can be proved by daily/monthly/yearly matching. ➢ As a default solution, the geographical correlation should be demonstrated if the RFNBO and RES-E productions are located in the same bidding zone. Such bidding zone being defined as the date of the Final Investment Decision for the RFNBO project. ➢ As suggested by Guidehouse, a compromise solution would be to increasingly implement these 4 requirements over time, in order to take into account the short-term scale-up and market uptake.

Finally, Eurelectric supports the Guidehouse proposal to introduce a transitory period to adapt the constraints and make principles of Article 27 manageable, from an operational point of view, for the RFNBO projects commissioned within that period. This transition mode should be in place until the target of 6GW of electrolysis installed in Europe is reached, and not stop automatically in 2024.

The requirements after the transitory period should be reevaluated, taking into account the experience and the feedback gathered on the existing RFNBO projects.

Eurelectric pursues in all its activities the application of the following sustainable development values:

Economic Development

- Growth, added-value, efficiency

Environmental Leadership

- Commitment, innovation, pro-activeness

Social Responsibility

- Transparency, ethics, accountability

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