

Implementation of EU rules on sourcing renewable electricity for RFNBO production:

Perspectives of non-EU countries

Aggregated by

PtX Hub – Hincio – Dii Desert Energy/MENA Hydrogen Alliance

The content of the report is based on inputs of project developers of the PtX Hub, Hincio and Dii Desert Energy/MENA Hydrogen Alliance networks

Introduction and background

The Delegated Act (DA) on Article 27 of the Renewable Energy Directive (RED) II describes detailed requirements for sourcing renewable electricity for the production of renewable fuels of non-biological origin (RFNBOs). These requirements “apply regardless of whether the liquid and gaseous transport fuel of non-biological origin is produced inside or outside the territory of the [European] Union” (Article 6). But can these ambitious requirements be met by projects outside of the EU and what are potential obstacles?

The [PtX Hub](#) joined forces with [Hincio](#) and [Dii Desert Energy](#) to analyse whether the requirements can actually be met in the regulatory system of respective countries outside of the EU. Therefore, interviews with project developers and other industry partners were conducted and feedback was aggregated based on a questionnaire that was specifically designed to capture obstacles and open questions concerning the DA on Article 27 illustrating where specifications may be required. Below feedback and open questions are summarized structured by the specific Articles in the DA.

Disclaimer:

Please be aware that the summary below does not necessarily reflect perspectives of the entire companies and organizations that took part in the survey nor the perspectives of Hincio or Dii Desert Energy but rather aims at providing aggregated feedback from multiple perspectives with a focus of non-EU countries.

The summary below does not necessarily reflect the positions of the PtX Hub and of the commissioning institutions or the implementing agency.



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Summary of feedback and questions received

1. Definitions (Article 2)



Bidding zones:

The definition also includes “equivalent concepts for third countries” but it remains unclear what ‘equivalent’ in detail constitutes and whether ‘equivalent concepts’ need to receive formal recognition and by whom. This is especially relevant in larger countries where there is one interconnected system, or several different systems, that is/are close to the 90 % threshold defined in Article 4 (1) and to the requirement stated in Article 4 (2d).

Direct connection:

Where direct connections need to be established, potential connections to the grid could be imposed as

- i. synergies for economic development need to be explored and used (e.g., in Africa, new built direct lines could also serve local communities)
- ii. technically, RE and EZ need to be connected to new grid to provide the needed inertia for electrical stabilisation
- iii. selling excess RE could be part of the business case (e.g., when EZ commissioning is only after RE commissioning)
- iv. the grid could provide a back-up for to protect material from unexpected voltage drops. In short: outside Europe, the distinction between direct line and ‘part of a’ grid is not obvious.

Question by the participating project developers:

The definition of direct line under Directive 2019/944 includes the specification on isolated generation sites and customers. Does this mean that also under this Article a direct line can only serve one customer?

Imbalance settlement period:

This particular definition is rather EU-specific, and it should be considered how countries outside of the EU can comply.

Electricity / energy downstream of the electrolyser:

The requirements on the environmental attributes of electricity (renewable and low carbon to determine ‘renewability’ vs. low carbon) for units downstream of the electrolyser are not clearly



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defined in the Delegated Acts. This is especially relevant for hydrogen derivatives with long supply chains (including intermediary carriers like NH₃).

When NH₃, used as an intermediary energy vector, is cracked back into H₂ in Europe for transport to hydrogen refuelling stations:

- eCracking technology is not available at scale, thus using (RFNBO compliant) electricity is not a viable option
- Use of biomethane could lead to the (mass balanced) creation of a biofuel and a RFNBO stream? This would lead to substantial complexity

2. Directly connected installations (Article 3)



36 months-synching:

Especially for large-scale projects where phased approaches are needed, stringent timelines might negatively affect the development of such projects.

Load station:

The projects of large scale (GW) have to have a load station connected to the grid for process and grid stability as well as for emergency purposes. A direct line from variable renewable power stations to the electrolyser without a grid connection is deemed not practical.

Surplus feeding to grid:

In many countries where Green Hydrogen projects are being developed, the RE penetration levels are low: at times additional RE capacity injects into the grid, it will displace fossil electricity generation. During non-RE-generation hours, electricity can be taken back from the grid: from a GHG point of view, this is net sum.

Question by the participating project developers:

Would the described scenario under Article 3 exclude any set-up where surplus renewable energy is fed to the grid and taken back out again during hours where the installation is not producing renewable electricity?

Repowering:

There may be cases where existing RE plants may be repowered and it is currently understood that this scenario would be count under this Article 3.

Accounting of mixed set-ups (Article 3 and 4)

A sourcing concept that uses the direct and the grid option (including PPA) is not specifically elaborated upon in this Delegated Act.

3. Grid connection – average grid electricity (Article 4)



Risk of not cutting the threshold for the previous year:

This criterion can only be evaluated ex-post which leads to huge uncertainties: The 90% threshold refers to the previous calendar year which does create a clear threshold, however, at the same time creates risks for off-take agreements if in hindsight the threshold was undercut by a small margin.

No public data available:

Question by the participating project developers:

What data sources are allowed if a country does not publish official grid carbon intensity or renewable share data?

Independent lines:

Question by the participating project developers:

Would an independent line (grid) that is specifically established for the purpose of distributing renewable electricity to certain projects also be considered under this set-up? Does the EU need to verify this potential new grid system as fully renewable?

4. Grid connection – PPAs (Article 4)



Temporal correlation:

The more flexibility on temporal correlation (i.e., less stricter rules than the one-hour requirement) is allowed, the better the electrolysers can be operated and the better the LCOH. Moreover, in many countries where Green Hydrogen projects are being developed, the RE penetration levels are low: at times additional RE capacity injects into the grid, it will displace fossil electricity generation. During non-RE-generation hours, electricity can be taken back from the grid: from a GHG point of view, this is net sum.

Additionality:

Except in places with a high share of hydro, it is believed that (large scale) RE generation for green hydrogen will be additional anyway due to lack of existence of RE capacities in developing countries.

PPAs:

While in some countries PPAs are 'new' (e.g., in Egypt: first PPA signed only in 2020), in other countries PPA would require a market reform (e.g., Oman). Therefore, PPAs could be an entry barrier for green hydrogen projects.

Additional production capacity:

The 36-month-requirement for additional production capacity (Article 4 (2a)) may be difficult to comply with as capacity expansions usually take longer than 36 months. Hence, a period of 36 months would require starting the planning for expansion even before the original plant would start operation which is not feasible.

Storage location:

Question by the participating project developers:

Why should the storage be located behind the meter of the electrolyser, why not at the RE generation plant?

Operating and investment aid:

It should be further clarified what exactly falls under "support in the form of operating aid or investment aid" as different and multiple support mechanisms in non-EU countries exist.

5. Common rules (Article 5) and GHG emissions

**Prove of data and information:**

It may be noted that most information that should be provided under Article 5 can only be generated by the electricity provider and actors further downstream in the supply chain are dependent on the information and vulnerable to potential costs to provide the data accordingly.

Downstream GHG emissions:

It is difficult for most projects to ensure the Well-to-Wheel GHG threshold, as many do not have finalized their offtake agreements, and therefore do not know the GHG emissions downstream from the port facilities.



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