

# Hydrogen in Europe:

## An update on the RED II Delegated Acts



Any good Shakespearian drama comes in at least five acts. The long-awaited Delegated Acts<sup>1</sup> under Articles 27 and 28 of RED II are no exception. In what could be the fourth act, the Acts were finally adopted by the European Commission on 10 February 2023.

The two Delegated Acts are inter-related and both are relevant to the classification of a fuel as a “renewable fuel of non-biological origin” (“**RFNBO**”) under the EU directive on renewable energy (“**RED II**”) and thus the ability for the use of such fuels to be counted towards RED II renewable energy targets. Meeting these criteria is fundamental for renewable hydrogen projects developed in the EU. Given the EU is positioning itself as a future major importer of hydrogen

and hydrogen derivatives (e.g. green ammonia and green methanol), projects around the globe have been waiting for the seemingly technical rules to be finalised.

The question now is if, and when, the fifth and final act can be expected, allowing thousands of hydrogen projects around the globe to move forward.

<sup>1</sup> COMMISSION DELEGATED REGULATION (EU) .../...of 10.2.2023 supplementing Directive (EU) 2018/2001 of the European Parliament and of the Council by establishing a Union methodology setting out detailed rules for the production of renewable liquid and gaseous transport fuels of non-biological origin (“**Article 27 Delegated Act**”).

COMMISSION DELEGATED REGULATION (EU) .../...of 10.2.2023 supplementing Directive (EU) 2018/2001 of the European Parliament and of the Council by establishing a minimum threshold for greenhouse gas emissions savings of recycled carbon fuels and by specifying a methodology for assessing greenhouse gas emissions savings from renewable liquid and gaseous transport fuels of non-biological origin and from recycled carbon fuels (“**Article 28 Delegated Act**”).

## Summary of previous developments

As we discussed in our previous publications on this topic, which can be found [here](#)<sup>2</sup>, classification as an RFNBO will have implications beyond the transport sector if the European Commission's proposed amendments to RED II under the "Fit for 55 package" (so-called "RED III") are implemented. Aspects of the Delegated Acts are also relevant under other key aspects of the EU's decarbonisation proposals, including the calculation of emissions for the purposes of compliance with FuelEU Maritime.

Stakeholders have generally reacted positively to the adoption of this set of rules: even far-from-perfect rules are better than no rules at all. The adoption of the Delegated Acts was delayed several times due to differences in opinion on the right level of stringency with respect to additionality and temporal and geographical correlation. The core concern that the production of renewable fuels should not result in the diversion of renewable electricity away from other purposes and therefore an overall increase in emissions remains very real.

However, the European Commission has finally set forth a set of rules that, in its view, strikes a pragmatic balance between the need to ensure that renewable hydrogen production uses *only* additional renewable electricity, and the need to support the acceleration of investment into hydrogen and renewable fuel development. In the context of the European energy crisis, decarbonisation agenda and competition for investment from the USA in particular, the paralysis needed to end. Legal certainty helps to open the door to business cases being finalised, final investment decisions being made and the ramping up of the green hydrogen market and its derivatives (including green ammonia and green methanol).

This is, however, not quite the finishing line that the word "adopted" might suggest.

In general, the European Parliament and the Council have two months to examine the Delegated Acts and only if no objection is raised (and the scrutiny period not extended) will the Delegated Acts enter into force. On 23 February 2023, the European Parliament extended the scrutiny period by another two months, further delaying the entry into force of the Delegated Acts.<sup>3</sup>

Furthermore, the finalisation of these acts is not as well in itself the end. The outcome of the RED III legislative process, including the amendments approved by the European Parliament in September 2022, which would remove the legislative basis for the Delegated Acts entirely, remains to be seen.

It would surely be strange for European co-legislators to unpick the position reached in the Delegated Acts that have taken so long to put in place but, on what has been such a controversial topic, no predictions can be made.

Nevertheless the following sets out the current status of the compromise reached.

### When is a fuel made from electricity considered renewable?

To guarantee that the production of RFNBOs only uses additional renewable electricity when and where available, such production shall be circumscribed to specific time and space rules.

We have set out, in the Appendix to this note, a table providing an overview of the different electricity supply paradigms that can be adopted by fuel producers, and the hurdles that need to be satisfied for such approach to be considered "renewable" in accordance with Article 27 of RED II.

See as follows for a quick snapshot of where we have landed in respect of some of the key concepts that have been part of this debate over the past 18-24 months:

- **Additionality:** By 2028, renewable hydrogen producers must ensure that the electricity used in their electrolyzers is from renewable generation installations that are no older than 36 months. First movers are exempted from additionality until 2038 if their hydrogen installation is commissioned before 2028. Fuel producers located in bidding zones with a very high renewable share of electricity, or with a low carbon intensity of electricity do not have to comply with this requirement.
- **Temporal Correlation:** Until 2030, renewable hydrogen producers are able to match their renewable hydrogen production with their contracted renewables electricity supply on a monthly basis. From 2030, such correlation will be stricter: on an hourly basis. This is intended to allow time for the development of markets, infrastructure and technologies needed for the synchronisation of electricity generation and hydrogen production. However, EU Member States will be able to introduce stricter rules on temporal correlation from 1 July 2027.
- **Geographical correlation:** Fuel producers taking electricity from the grid supported by renewable power purchase agreements ("PPAs") must be located in the same bidding zone as the renewable generator with whom they have entered a PPA, or in an interconnected bidding zone (including if that is in another EU Member State), if the day-ahead market price in this zone is equal or higher than where the fuel producer is located.

2 <https://www.allenoverly.com/en-gb/global/news-and-insights/publications/red-ii-draft-delegated-acts-the-missing-pieces-of-the-eus-hydrogen-puzzle>

3 According to the EU "Register of delegated and implementing acts".

## Grandfathering and transitional periods

Neither of the Delegated Acts includes the complete grandfathering of projects that come into operation within a certain timeframe. However, a number of the requirements in the Article 27 Delegated Act will be phased in gradually. Over time, the rules will become more stringent for all projects. The ability to take advantage of short-term concessions will be limited for first movers seeking long-term financing for projects that do not involve the development of integrated “direct connection” renewable generation and fuel production facilities. The pressure for further technological developments by 2030 also add an additional layer of technology risk for first of a kind projects.

Strict rules on additionality and temporal and geographical correlation would make renewable hydrogen projects more expensive and restrict market development, but the transitional periods postpone this to allow an opportunity for early growth. Government intervention to close the pricing gap between renewable hydrogen or its derivatives and counterfactual fuels may also help to offset concerns. Whilst stakeholders would welcome the transitional periods being extended further, some NGOs have expressed that it is too long already. It is difficult at this stage to assess if the EU got the balance right.

## The nuclear debate

Nuclear energy is not ‘renewable’ energy for the purposes of RED II given that it uses enriched uranium as a fuel, which is itself not a renewable material. Therefore, nuclear generated electricity is generally not one of the energy sources from which RFNBOs may be produced.

However, in a concession to France after much lobbying, the Article 27 Delegated Act now provides that bidding zones with a low carbon electricity mix may be exempted from the additionality rule. Fuel producers in such areas must still contract renewable energy generation capacity by means of entering into PPAs with renewable electricity generators for an amount that is at least equivalent to the amount of

electricity that is claimed as fully renewable. However, the renewable electricity generators do not need to be newly erected. This way the European Commission opened the door for hydrogen produced by connection to grids with high levels of nuclear power to be considered green. The exemption will apply if the average “emission intensity” (i.e. low carbon intensity) of electricity is lower than 18gCO<sub>2</sub>eq/MJ. This means that the exception will apply as long as a country’s electricity production emits less than 65g CO<sub>2</sub>eq per kilowatt hour (“kWh”).

France and Sweden are the only EU Member States that currently meet these criteria (Sweden generates 45% of its energy from hydropower and 40% from nuclear). In 2021, when France’s nuclear power was almost fully operational, French power emissions stood at 56g CO<sub>2</sub>eq per kWh. Critics say that the inclusion of nuclear may lead to an increase of fossil-based power generation as the diversion of nuclear power for hydrogen would have to be compensated somehow, which might not be the case where the additionality requirements do not apply.

## So, is it clear now?

Much of the drafting ambiguity identified in the previous versions of the Delegated Acts remains in the currently adopted version. For example, the absence of provisions addressing the use of battery storage as part of a direct connection electricity supply is unhelpful, as is the absence of definitions of terms such as “new storage asset”.

One area that remains unclear in the drafting is the application of rules to hydrogen vs hydrogen derived fuels (e.g. methanol, ammonia). In particular, the drafting of the legislative provisions continues to lack clarity regarding whether the requirements of Article 27 para 3 RED II and the Article 27 Delegated Act apply to all electricity used in the production of an RFNBO, or only to electricity from which the energy content of the RFNBO is derived.

Given the RED II definition of an RFNBO as a fuel, “*the energy content of which is derived from renewable sources*





(*other than biomass*)”, and based on interpretation of the wider provisions of RED II and Article 28 Delegated Act, it could be argued that these requirements are only relevant to electricity from which the energy content of the RFNBO is derived.

A similar line of argument could also be made based on the Q&A provided by the European Commission, which suggests that provided that fuels such as ammonia and methanol are produced from renewable hydrogen (which has been produced from renewable sources, other than biomass) such fuels should be considered RFNBOs.

However, even if this less strict interpretation were to prevail, technical input would be required on a case by case basis to confirm the source from which the energy content of the relevant fuel being considered as a RFNBO has been derived, and the requirements of Article 27(3) RED II and the Article 27 Delegated Act applied accordingly to all relevant electricity.

Furthermore, the emissions associated with all electricity used in the production of an RFNBO are taken into account for the purposes of assessing the GHG savings from use of an RFNBO.

### Greenhouse gas savings

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Since January 2021, the greenhouse gas (“GHG”) savings from the use of RFNBOs needed to be at least 70% (when compared to a fossil fuel comparator). Details of how to calculate the 70% GHG savings requirement are contained in the Article 28 Delegated Act, which includes a methodology for calculating full life-cycle GHG emissions and savings for RFNBOs and recycled carbon fuels.

The Article 28 Delegated Act has generally been less controversial, and the version adopted has not moved materially from the version published in May 2022. The carbon intensity of green hydrogen and its derivatives must not be greater than 28.2 gCO<sub>2e</sub>/MJ, which according to technical experts amounts to 3.4 kg of CO<sub>2e</sub>/kg (taking into account a full lifecycle basis, including upstream emissions, emissions associated with inputs, including electricity, from processing, and those associated with transporting these fuels to end-consumer and the end customer’s use (including combustion) of that fuel).

Emissions associated with all electricity used to produce an RFNBO are taken into account for the purposes of the assessment under the Article 28 Delegated Act.

Electricity that is qualified as fully renewable in accordance with Article 27 RED II (and the Article 27 Delegated Act) shall be attributed zero GHG emissions. Electricity used in the production of the RFNBO that does not qualify as fully renewable according to Article 27(3) RED II shall be attributed greenhouse gas emissions in accordance with alternative approaches set out in the Article 28 Delegated Act. The current version of Article 28 Delegated Act contains a number of clarifications and a few paragraphs on co-processing where liquid RFNBOs and recycled carbon fuels only partially replace a conventional input. Finally, Article 28 Delegated Act now also recognises the possibility to capture the carbon from liquid RFNBOs in the overall lifecycle.

### Europe as an import market

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There is no loophole for green hydrogen and its derivatives if produced in third countries and imported into the EU. Criteria under RED II and the Delegated Acts apply to green hydrogen and other RFNBOs produced inside or outside the EU. The arrangements prescribed under the Delegated Acts will therefore be of relevance to any hydrogen production project that wishes to market its product (or derivatives therefrom) as an RFNBO in European markets. However, limited further guidance is given on how to apply certain concepts in the Delegated Acts outside the EU.

A particular example of this is in relation to the interpretation of references to “investment aid and operating aid” in the Article 27 Delegated Act. It is therefore possible that fuels will not meet the European requirements where fuel producers use electricity from assets that have benefited from renewable subsidy or tax credit schemes in non-EU Member States (think of the recent Inflation Reduction Act in the US, which increases tax credit schemes for renewables and hydrogen alike), or even received other forms of state support that would fall within the ambit of European state aid rules had that support been provided in a Member State.

A further example is in relation to a “bidding zone”. In relation to non-EU Member States, the most similar equivalent concept must be used, which could be similar market regulations, the physical characteristics of the electricity grid, notably the level of interconnection, or, as a last resort, the respective country.

We should certainly hope the European Commission will issue further guidance to avoid excessive uncertainty and a fragmented interpretation by EU Member States.

## Certification

The Article 27 Delegated Act and RED II contemplate the accreditation and certification of renewable hydrogen under national schemes or international voluntary certification schemes to be approved by the EU, so as to ensure that producers (either from within the EU or a third country) can demonstrate in a simple and easy way their compliance with the Delegated Act framework and trade renewable hydrogen and its derivatives in the EU.

EU Member States are required to accept the evidence obtained from schemes that have been recognised by the European Commission, as a measure to avoid different rules being implemented by different EU Member States and burdening hydrogen producers with different administrative procedures. The recognition and prevalence of mutually recognised and consistent certification continues to be one of the main hurdles to a fully functioning global market in e-fuels.

**In summary**, the adoption of the Delegated Acts provides some much needed visibility and certainty for developers of hydrogen and hydrogen derived fuel projects and their current or prospective investors.

Whether the five to seven year transitional periods are long enough to allow sufficient momentum to build behind a European hydrogen economy is unclear, and how producers and their offtakers allocate the risk of compliance with the rules (and any subsequent changes to them) is already a key area of discussion on the wave of e-fuel offtake agreements we are currently advising on.

However, the biggest question is perhaps whether these rules are the first step in preventing the so-called exodus of hydrogen investment to the US after the adoption of the Inflation Reduction Act.

For readers who are newer to the European regulatory treatment of hydrogen and its derivatives, or indeed the wider European decarbonisation programme, previous articles written by the A&O team may be found here:

[Hydrogen: Latest EU policy updates](#)

[Clean hydrogen projects in the EU](#)

[Polish hydrogen strategy](#)

[The Belgian federal hydrogen vision and strategy](#)

[UK hydrogen strategy – Top ten takeaways](#)

[Clean hydrogen in Europe: The only way forward is together](#)

[Clean hydrogen in France](#)

[German hydrogen strategy](#)

[The EU Commission's Hydrogen Strategy: A turning point?](#)



# Appendix 1

Overview of the Article 27 DELEGATED Act requirements for electricity used in the production of renewable fuels of non-biological origin

Electricity Supply Route	Physical/ commercial set up required	Temporal correlation required between renewable electricity generation and fuel production	Geographical correlation required between renewable electricity generation and fuel production	Additionality (time)	Additionality (aid)
Direct Connection (Article 3)	<ul style="list-style-type: none"> <li>– Direct line connection between renewable electricity generation installation and fuel production installation, or fuel production and renewable electricity generated within the same installation.</li> <li>– Renewable electricity generation installation not connected to the grid, or has a smart metering system that can show no electricity has been taken from the grid.</li> </ul>	Assumed	Assumed	Renewable electricity generation installation came into operation no earlier than 36 months prior to fuel production installation.	None
From the grid in a bidding zone with very high share of renewable electricity (Article 4(1))	<ul style="list-style-type: none"> <li>– Fuel production installation is located in a bidding zone where the average proportion of renewable electricity exceeded 90% in the previous calendar year<sup>4</sup>.</li> <li>– The production of fuel does not exceed a maximum number of hours in a year proportionate to the share of renewable electricity reported for that bidding zone.</li> </ul>	None	None	None	None

<sup>4</sup> This is calculated by dividing the gross final consumption of electricity from renewable sources in the bidding zone (by analogy to the rules in Art7(2) RED II) by the gross electricity production from all energy sources (as defined in Annex B to Regulation (EC)(1099/2008) other than water previously pumped uphill, plus imports minus exports of electricity to the bidding zone. Once determined to exceed the 90% threshold, this is deemed to be the case for the next 5 years.

Electricity Supply Route	Physical/ commercial set up required	Temporal correlation required between renewable electricity generation and fuel production	Geographical correlation required between renewable electricity generation and fuel production	Additionality (time)	Additionality (aid)
<p>From the grid other than in a low emission intensity bidding zone</p> <p>(Article 4(4) and Articles 5,6 and 7)</p>	<ul style="list-style-type: none"> <li>– Fuel production installation physically connected to the grid.</li> <li>– Electricity either generated in renewable electricity generation installation owned by the fuel producer, or procured under a PPA entered into directly or indirectly with an economic operator producing renewable electricity and the electricity is effectively produced in those installations.</li> </ul>	<p>Until 31 December 2029, fuel to be produced either: (i) in the same calendar month as the renewable electricity was generated, (ii) from renewable electricity from a new storage asset located “behind the meter” at the electrolyser or renewable electricity generation installation that was charged during the same calendar month as the renewable electricity was generated; or (iii) during an hour period where the price of electricity resulting from single day-ahead market coupling in the bidding zone is lower than or equal to €20/MWh or lower than 0.36x the price of an EU ETS allowance.</p> <p>From 1 January 2030, fuel to be produced either: (i) in the same hour as the renewable electricity was generated, or (ii) from renewable electricity from a new storage asset located “behind the meter” at the electrolyser or renewable electricity generation installation that was charged during the same hour as the renewable electricity was generated or (iii) during an hour period where the price of electricity resulting from single day-ahead market coupling in the bidding zone is lower than or equal to €20/MWh or lower than 0.36x the price of an EU ETS allowance.</p>	<p>The electrolyser is located either:</p> <ul style="list-style-type: none"> <li>(i) in the same bidding zone as the renewable electricity generation installation (or it was when the relevant renewable electricity generating installation came into operation);</li> <li>(ii) in an interconnected bidding zone (including in another Member State) as the renewable electricity generating station AND the electricity prices in the relevant time period on the day-ahead market in that interconnected bidding zone is higher than where the fuel is produced; or</li> <li>(iii) in a bidding zone that is interconnected with an offshore bidding zone in which the renewable electricity generating installation is located.</li> </ul>	<p>Renewable electricity generation installation come into operation no earlier than 36 months prior to fuel production installation.</p>	<p>Renewable electricity generating installation to have received no investment aid or operating aid, other than permitted aid<sup>5</sup>.</p>


5. Being, in respect of any installation generating renewable electricity:


- (a) support received by such installation prior to its repowering;
- (b) financial support received by such installation for land or grid connections;
- (c) support received by such installation that has been fully repaid; or
- (d) support received by such installation generating renewable electricity that is supplying fuel production installations producing fuel used for research, testing and demonstration.

Electricity Supply Route	Physical/ commercial set up required	Temporal correlation required between renewable electricity generation and fuel production	Geographical correlation required between renewable electricity generation and fuel production	Additionality (time)	Additionality (aid)
From the grid in a low emission intensity bidding zone (Article 4(2) and Articles 6)	<ul style="list-style-type: none"> <li>– Fuel production installation physically connected to the grid in a bidding zone where the emission intensity of electricity is lower than 18gCO<sub>2</sub>e/MJ<sup>6</sup>.</li> <li>– Fuel Producer procures electricity under a PPA entered into directly or indirectly with an economic operator producing renewable electricity and the electricity claimed is effectively produced in those installations.</li> </ul>	None	None	None	None
Curtailed renewable electricity (Article 4(3))	<ul style="list-style-type: none"> <li>– Fuel production installation physically connected to the grid.</li> <li>– Electricity used to produce the fuel is consumed during an imbalance settlement period during which the fuel producer can demonstrate (with evidence from the national system operator) that (i) power generating installations using renewable energy sources were re-dispatched downwards and (ii) electricity consumed for the production of the fuel reduced the need for re-dispatching by a corresponding amount.</li> </ul>	None	None	None	None

<sup>6</sup> Emission intensity determined following the approach for determining the average carbon intensity of grid electricity in the methodology for determining the GHG savings from RFNBOs and recycled carbon fuels set out in the Article 28(5) Delegated Act. Once determined to be below the 18gCO<sub>2</sub>e/MJ, it considered to stay that way for 5 years.

### For the purposes of the above table:

 Transitional provision applies – for all fuel production plants that come into operation before 1 January 2028, these requirements will not apply until 1 January 2038. This exception does not apply to any fuel production capacity added after 1 January 2028.

 Member states may notify the European Commission that hourly temporal correlation shall apply from 1 July 2027 for fuel produced in their territory.

 Member States can introduce additional criteria concerning the location of electrolysers and renewable electricity installations in order to ensure compatibility of capacity additions with national planning of the hydrogen and electricity grid.