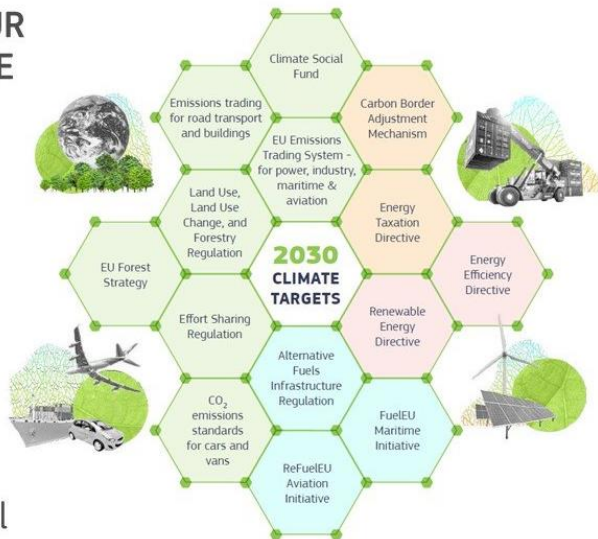


**EU Requirements for
 RFNBOs / PtX**
 Renewable electricity sources and GHG emissions
 savings

Quick recap: EU Green Deal and targets

EUROPEAN GREEN DEAL

REACHING OUR 2030 CLIMATE TARGETS



#EUGreenDeal

- **32% renewables by 2030 (RED II) → 45%, REPowerEU**
- **Sub-target RFNBOs (including renewable hydrogen) for industry: 50% RFNBOs (Fitfor55) → 75%, REPowerEU**
- **Sub-target RFNBOs (including renewable hydrogen) for transport: 2.6% RFNBOs (Fitfor55) → 5%, REPowerEU**

Target/Year	2025	2030	2035	2040	2045	2050
Percentage of SAF used in air transport	2 %	5 %	20 %	32 %	38 %	63 %
Of which: sub-mandate synthetic fuels (or e-fuels/RFNBOs)	-	0.7 %	5 %	8 %	11 %	28 %

REPowerEU: 10 Mt / year domestic + 10 Mt / year imports of renewable hydrogen by 2030

European Hydrogen Bank: €3 bn
H2Global: €4bn

EU Commission proposals for REDII Delegated Acts on RFNBOs / renewable H2

Delegated Act to Article 27 of the Renewable Energy Directive II (RED II) sets out **detailed requirements for sourcing renewable electricity** used in production of Renewable Liquid and Gaseous Fuels of Non-Biological Origin (RFNBOs), including renewable hydrogen

→ **Determines when electricity used for production of RFNBO/ H2 is considered as “fully renewable” or not**

Delegated Act to Article 28 of the RED II specifies the **methodology for assessing GHG emissions savings** from RFNBOs.

→ **Determines amount of GHG emissions savings from RFNBO / H2 (min. 70%)**

→ *Applicable to production inside and outside the EU*

→ *To be translated into certification schemes*

Electricity used for H2 / RFNBO counts as “fully renewable” if...

Direct line

Direct connection, Article 3

Electrolyser is not connected to the grid or smart metering can prove that no electricity was taken from grid



Grid connection

Average grid electricity, Article 4 (1)

Electrolyser is located in a bidding zone where average share of RES electricity > 90% in the previous calendar year *and* production does not exceed a max. number of hours



Downwards re-dispatching, Article 4 (2)

Electricity is consumed during time of downward re-dispatch of RES plants and reduces need for redispatching



Renewable grid electricity via PPAs, Article 4 (3)

Need to fulfil: Additionality (Art. 5), Temporal correlation (Art. 6), Geographical correlation (Art. 7)

For Direct Connection and Renewable grid electricity via PPAs: RES plant started operating no earlier than 36 months before the electrolyser; *Additional electrolyser capacity can be added until 36 months after first starting operation*

Renewable grid electricity via PPAs - Article 4 (3)

Additionality (Article 5) fulfilled if producer has concluded PPA(s) with RES plant that...

- started operating for the first time or after repowering max. 36 months earlier than the electrolyser (repowering = investments into refurbishment exceeding 30% of cost for new plant) **and**
 - has not received CAPEX or OPEX support (except: for land or grid connection or fully repaid or before repowering)
- First mover reward: exemption from additionality criterion until 31 December 2036 if electrolyser started operating before 1 January 2027 (but not for capacity added after), see Art. 10)*

Temporal Correlation (Article 6) fulfilled if RES electricity under PPA(s)...

- is consumed by the electrolyser within the same quarter of the year (*until 31 March 2028*) / one hour period (*from 1 April 2028*) **or**
- comes from a new storage asset behind same network connection point as electrolyser **or** the RES plant was charged during same quarter of the year (*until 31 March 2028*) / one hour period (*from 1 April 2028*) **or**
- The RFNBO was produced during a one-hour period when...
 - clearing price of electricity from single day-ahead market coupling in the bidding zone $\leq 20 \text{ € / MWh}$ **or**
 - clearing price of electricity from single day-ahead market coupling in the bidding zone < 0.36 times the price of an allowance to emit 1 t CO_{2e} during the relevant time period

Geographical Correlation (Article 7) fulfilled if RES electricity plant is located in...

- same bidding zone as electrolyser at time when it started operating **or**
- interconnected bidding zone where electricity prices on day-ahead market for the relevant time period \geq bidding zone where electrolyser is located **or**
- offshore bidding zone interconnected with bidding zone where electrolyser is located

Member States may introduce additional criteria.

Additional provisions

(3) **“The rules set out in this Regulation should apply regardless of whether the liquid and gaseous transport fuel of non-biological origin is produced inside or outside the territory of the Union.** Where reference is made to bidding zone and imbalance settlement period, concepts that exist in the Union but not in all other countries, **it is appropriate to allow fuel producers in third countries to rely on equivalent concepts** provided the objective of this Regulation is maintained and the provision is implemented based on the most similar concept existing in the third country concerned. In case of biddings zones such concept could be similar market regulations, the physical characteristics of the electricity grid, notably the level of interconnection or as a last resort the country.”

(11) **“Fuel producers could combine different options for counting electricity** that is used for the production of renewable liquid and gaseous transport fuels of non-biological origin in a flexible way **provided only one option is applied for each unit of electricity input.** In order to verify whether the rules have been followed correctly it is therefore appropriate to request fuels suppliers to **thoroughly document which options were applied** to source renewable electricity that is used for the production of renewable liquid and gaseous transport fuels of non-biological origin. **Voluntary schemes and national schemes are expected to play an important role in the implementation and certification of the rules in third countries.**”

(15) **“The reliance on fossil fuels for electricity generation should decline over time with the implementation of the European Green Deal and the share of energy from renewable sources should increase. The Commission should monitor this development closely and reassess the requirements set out in this Regulation when the target for the overall share of renewable energy set out in Directive (EU) 2018/2001 is achieved.**”

Methodology for determining GHG emissions savings from H2 / RFNBO

Total emissions from use of fuel = $e_i + e_p + e_{td} + e_u - e_{ccs}$

e_i = e_i elastic + e_i rigid - e ex-use (**carbon source**) = emissions from **supply of inputs** (gCO₂eq / MJ fuel)

e_p = emissions from **processing** (gCO₂eq / MJ fuel)

e_{td} = emissions from **transport and distribution** (gCO₂eq / MJ fuel)

e_u = emissions from **combusting** the fuel in its end-use (gCO₂eq / MJ fuel)

e_{ccs} = emission savings from **carbon capture and geological storage** (gCO₂eq / MJ fuel)

GHG emission savings = $(E_F - E) / E_F$

E_F = Total emissions of fossil fuel comparator (94 gCO₂e/MJ for H₂)

E = Total emissions of H₂ (gCO₂e/MJ)

→ **Min. emissions savings of 70%**

**Min. 70%
emissions
savings**

Methodology for determining GHG emissions savings from RFNBOs

Avoided emissions for carbon capture from existing use or fate (e ex-use):

- activities covered by EU ETS (industrial processes, combustion of unsustainable fuels) But: If no effective carbon pricing in place in third countries, carbon will have to be accounted for.
- direct air capture (DAC)
- biogenic sources (only combustion or production of biofuels, bioliquids or biomass fuels) that fulfil sustainability criteria
- combustion of RFNBO that fulfil sustainability criteria
- Geological source where CO₂ was previously released naturally

Non-sustainable sources considered as avoided emissions until 2035 if from production of electricity, until 2040 if from other uses.

Co-processing:

- Where RFNBOs only partially replace a conventional input, it shall be distinguished based on proportion of energetic value of inputs.

Determining carbon footprint of electricity supply (e_i):

- If considered as „fully renewable“ according to rules in DA27, carbon intensity is considered to be zero
- If the electricity taken from the grid is not considered as “fully renewable”:
 - the average carbon intensity of electricity consumed in country of production should be applied **or**
 - if number of FLH that the electrolyser is running \leq number of hours in which marginal price of electricity by RES or nuclear plants in the previous calendar year, the carbon footprint is zero **or**
 - GHG emissions value of the marginal unit generating electricity in the bidding zone at the time of production of H₂ is applied

What's next?

After EC adoption of final version, EP has two months to formulate any objections. If there are no objections, the delegated act enters into force.

→ Implementation and “interpretation” by voluntary schemes

Still under discussion:

- Third country interpretation and application of the rules described under the two Delegated Acts
 - Can use own certification schemes?
 - Which equivalent concepts are eligible?
 - ...

Thank you.

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