Federal Ministry
for Economic Affairs
and Climate Action

BILATERAL CLIMATE AND ENERGY PARTNERSHIPS

CROSS-CUTTING THEME: HYDROGEN

THE EU'S REGULATORY FRAMEWORK FOR REALISING HYDROGEN IMPORTS

To establish functioning hydrogen value chains, the aim is to create regulatory certainty for all stakeholders involved. There are several EU instruments that constitute the regulatory framework enabling a sustainable market environment that can facilitate the market ramp-up of hydrogen and hydrogen derivatives.

EU Emission Trading Scheme (EU ETS) and Emission Trading Scheme 2 (ETS2)

EU ETS requires polluters to pay for their greenhouse gas emissions

The EU Emissions Trading System (EU ETS) uses a 'cap and trade' mechanism to require polluters to pay for greenhouse gas (GHG) emissions, with an **annual cap that is progressively reduced**. It covers sectors such as electricity and heat generation, industrial manufacturing, aviation and maritime transport, and grey hydrogen production, with **emission allowances sold through auctions** or allocated free allowances for carbon leakage mitigation. A market stability reserve controls price volatility. The system operates across the EU, Iceland, Liechtenstein and Norway and has been linked to the Swiss ETS since 2020.

Renewable hydrogen producers receive free ETS allowances from 2025

Renewable hydrogen and synthetic gas producers with a capacity over five metric tons per day will receive free carbon credits starting in 2025. Producers can sell these credits to **offset the 'green premium' of production costs** as renewable hydrogen generates no direct carbon emissions.

ETS2 complements the already existing ETS

The ETS2 will expand the EU ETS to include sectors like fuel combustion in buildings, road transport and small industries not covered by the current EU ETS. **Starting in 2025, fuel suppliers will take on the responsibility for emission monitoring and reporting**. A market stability reserve will prevent excessive price spikes during the first three years. And while ETS2 is set for full operation by 2027, its start may be delayed to 2028 if gas and oil prices are exceptionally high in 2026.

Carbon Border Adjustment Mechanism (CBAM)

CBAM aims for a cleaner industrial production in non-EU countries

The Carbon Border Adjustment Mechanism (CBAM) **aims to promote cleaner industrial production and protect domestic industries** from global competitors with weaker carbon regulations. It obliges importers in the emission-intensive sectors **aluminium, steel, iron,**

hydrogen, electricity, ammonia and fertilizers to report the carbon content of their products. They must pay the difference between the price of emitting the CO_2 in the EU and in the country in which the products are made. CBAM will be gradually introduced alongside the phase-out of free carbon allowances under the EU ETS from 2026 to 2034, preventing industry migration. In an attempt to ease the administrative burden on small and medium enterprises and restrict CBAM to large importers with the highest share in emissions, the European Commission plans to exempt roughly 80 per cent of EU companies that would have been subject to CBAM under the original regulation.
As for hydrogen, CBAM only encompasses the production of **pure hydrogen or mixtures of hydrogen with nitrogen usable in ammonia production**. According to Commission Implementing Regulation (EU) 2023/1773 of 17 August 2023 it does not cover the production of synthesis gas or of hydrogen within refineries or organic chemical installations where hydrogen is exclusively used within those plants and not used to produce CBAM-listed goods. Possible production paths under the Implementing Regulation include steam reforming and partial oxidation, electrolysis of water, chloralkali electrolysis as well as production of chlorates.

The transitional phase for CBAM (2023–2025) introduces measuring of embedded emissions

The transitional phase has introduced reporting on embedded emissions. As of August 2024, **all importers (CBAM declarants) must report direct and indirect emissions** for all imported goods without the need to purchase certificates (CBAM Implementing Regulation 2023/1773). If the actual total emissions cannot be provided, CBAM declarants must verify that all possible efforts were made to obtain data from suppliers and manufacturers. The use of default values provided by the EU Commission to determine the grand total of embedded emissions was permitted until 30 June 2024. For the remaining transitional period until 31 December 2025, this flexibility option is restricted to complex goods (reliant on precursors materials) and a quantitative limit of 20 per cent of the total embedded direct emissions along the entire production chain.

As for the indirect emissions from electricity for water electrolysis, a key point of facilitation for importers of renewable hydrogen is that **under CBAM no double certification is needed when RFNBO hydrogen is already certified** in compliance with the EU's RED II Directive and Commission Delegated Regulation (EU) 2023/1184. This acts as a means to demonstrate zero indirect emissions for the electricity being used according to the Commission Implementing Regulation (EU) 2023/1773.

CBAM payment regime starts in 2026

EU importers of CBAM-covered goods must **register with national authorities and purchase CBAM certificates**. From early 2025, CBAM declarants will be able to apply for the 'authorised CBAM declarant' status via the **CBAM Registry**. Their application will be processed by the National Competent Authority of the EU Member State where they are established. This status will become mandatory as of 1 January 2026 for the import of CBAM goods in the EU customs territory. From 1 January 2025, a new online portal section of the CBAM Registry allows installation operators outside the EU to **share their installations and emissions data** with reporting declarants instead of submitting it to each declarant separately.

The price to be paid will be based on the weekly average auction price of EU ETS allowances (€/metric ton CO_2 emitted). Importers will declare embedded emissions and surrender the corresponding number of certificates annually, with deductions for any carbon price paid in the producing country.

Renewable Energy Directive III (RED III) and the Delegated Acts

Art. 27(6) of RED III and the Delegated Act 2023/1184 facilitate renewable hydrogen production

There are three different options regarding electricity sourcing to produce renewable fuels of non-biological origin (RFNBOs):

- **Direct connection**
  Electricity is considered fully renewable if the plant is directly connected to the electrolyser and starts operation no earlier than 36 months before the electrolyser.

- **Electricity grid + PPA(s)**
  Electricity is considered fully renewable if the electricity sourced meets four key criteria: it must be obtained through power purchase agreement(s) (PPAs) for renewable electricity, **demonstrate additionality** by incentivizing new renewable energy capacity, **satisfy geographical correlation** by being produced in the same or an interconnected bidding zone and **fulfil temporal correlation** by being generated within the same one-hour time period as the

RFNBO production (until 31 December 2029 on a monthly basis). For electrolysers coming into operation before 1 January 2028, the additionality requirement will not apply until 1 January 2038. For electrolysers coming into operation after 1 January 2028, the additionality requirement will apply from the first day of operation. The delayed enactment of the additionality requirement aims to **facilitate the development of early-stage hydrogen projects** and accelerate market growth for renewable hydrogen (Grandfathering provision, Delegated Act 2023/1184).
There are ongoing discussions between the EU Commission and the German government, as there are growing concerns, that the **current rules could be overly demanding**. Thus, the German government proposed to postpone the additionality criterion from 2028 to 2035 and the temporal correlation rule to require hourly matching from 2030 to 2031.

- **Indirect connection: High renewable electricity share**
  Hydrogen must be produced within bidding zones where the average share of renewable electricity exceeded 90 per cent in the preceding year.

Art. 29 of RED III and the Delegated Act 2023/1185 set a GHG threshold for hydrogen to count as RFNBO and define permissible CO_2 sources

GHG calculation formula for the entire value chain (excluding production of machinery and equipment):

$$E = e_i + e_p + e_{td} + e_u - e_{ccs}$$

E	Total emissions
e_i	Emission from supply of inputs
e_p	Emission from processing
e_{td}	Emission from transport and distribution
e_u	Emission from combusting the fuel in its end-use
e_{ccs}	Emission savings from carbon capture and storage

With fossil reference value for RFNBOs (renewable fuels of non-biological origin): 94 g CO_2/MJ and a threshold for carbon emissions for **hydrogen to qualify as renewable at 3.34 g CO_2/kg H2** (emission savings of a minimum of 70 per cent to fossil fuel comparator).

Permissible sources of CO_2 as feedstock for RFNBOs:

- CO_2 from fossil fuel combustion for electricity generation (until 12/2035), other industrial point sources from activities listed in Annex I of the ETS Directive (until 12/2040), biogenic CO_2 and DAC (Direct Air Capture).
- In 2024, the EU Commission published a Q&A document that details the requirements for 'effective CO_2 pricing'. Such pricing is a prerequisite for the use of industrial point sources.

RED III introduces ambitious RFNBO quota for industry (Art. 22(a))

Member States must ensure that **by 2030, at least 42 per cent** of hydrogen used in industry for final energy and non-energy purposes comes from RNFBOs, **increasing to 60 per cent by 2035**. (Exemptions: hydrogen used for conventional fuels, biofuels, decarbonising industrial gases, and as a by-product in industrial processes).

RED III introduces quotas of RFNBOs for the transport sector (Art. 25)

Joint quotas for RFNBOs and advanced biofuels must be fulfilled, starting at 1 per cent in 2025 and rising to 5.5 per cent by 2030, with at least 1 per cent coming from RFNBOs. Under **ReFuelEU Aviation**, EU airports will require a minimum 2 per cent SAF blend in 2025, increasing to 70 per cent by 2050. **FuelEU Maritime** sets a mandatory reduction in fuel GHG intensity, starting at 2 per cent in 2025 and reaching 80 per cent by 2050.

RED III presents mass balancing as a trading model for hydrogen

Mass balancing is a trading model where the physical hydrogen product and its sustainability certificates are traded together between parties, **ensuring traceability throughout the value chain** (producers, retailers, suppliers). This allows all parties to comply with the required criteria and provide accurate product information.

The certification of economic operators and hydrogen as RED III-compliant is the responsibility of voluntary schemes

The **European Commission is responsible for recognising voluntary schemes** for RFNBO certification. ISCC, REDcert and CertifHy are now fully recognised by the EU as voluntary schemes for the certification of RFNBO and RCF (recycled carbon fuels) quantities.

Certification bodies, which **must be recognised** by a national accreditation body or competent authority, perform audits as part of these voluntary schemes. These

bodies participate in regular training courses, and the audits are conducted in accordance with ISO 19011 standards.

Economic operators must register with a voluntary scheme, but before doing so, they are required to undergo an initial audit. When a certificate is issued, the certification bodies inform the competent authority. Economic operators enter RFNBO quantities into the Union Database and corresponding national registries, which ensures traceability along the value chain.

This comprehensive process ensures **a standardised approach to certifying RFNBOs** across the EU, incorporating multiple layers of oversight and verification to maintain the integrity of the certification system. The certification rules apply within and outside of the EU and **voluntary schemes operate on a global scale.** Some EU-specific concepts (in particular, bidding zones and curtailment) must be applied in an equivalent manner in third-party countries.

Gas Market Directive and Regulation

The Gas Market Package aims to decarbonise the gas market and regulate hydrogen networks (Gas Market Directive (EU) 2024/1788 and Regulation (EU) 2024/1789 on the internal markets for renewable gas, natural gas and hydrogen)

The Gas Market Directive introduces a **definition for low-carbon fuels,** requiring them to meet the same minimum emission savings as RFNBOs (a corresponding Delegated Act is due to come into force in 2025). The Directive (EU) on **common rules for the internal markets of renewable gas, natural gas and hydrogen** came into force on 13 June 2024, with Member States given two years to implement it into national law. Additionally, the Gas Market Package encompasses several instruments:

- Third-party access to H_2 grids, storage and terminals
- Vertical unbundling
- Horizontal unbundling
- Financing of H_2 networks
- Derogation rules
- Joint hydrogen purchasing platform
- Separation of regulated asset base
- European H_2 network operators
- Blending rules

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Authors: Dr. Robert Stüwe, Raffael Barth, Annika Würfel, Jérôme Seibert

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