



Overview of European Hydrogen regulation

1 EU Regulatory framework

2 EU Targets and certification

3 Regulation for hydrogen projects
(Hydrogen Package and Net Zero Industry
Act)

EU Regulatory Framework

Key EU Regulation for H2

H2 production

H2 projects



Renewable H2

- Renewable Energy Directive Adopted
- Delegated Act about H2 production Adopted
- Delegated Act about GHG emissions calculations Adopted

Low-carbon H2

- Hydrogen and decarbonised gas market package Adopted
- Delegated Act about H2 production 2025
- Methodology for GHG emission savings 2025

H2 in the transport sector

- FuelEU maritime initiative Adopted
- RefuelEU aviation initiative Adopted
- TEN-T Adopted

H2 technologies & infrastructure

- Net-Zero Industry Act Adopted
- TEN-E Adopted

TEN-T - Trans-European Transport Network
TEN-E - Trans-European Networks for Energy

Renewable hydrogen



Renewable
hydrogen

No definition



Renewable Energy Directive (RED)



Hydrogen and decarbonised gas
market package

Renewable hydrogen

Q&A implementation of hydrogen delegated acts

Version of 14/03/2024

Main criteria



Renewable
hydrogen

1. fulfil the definition of an RFNBO in RED

- **Renewable fuel of non biological origin or RFNBO** means liquid and gaseous fuels the energy content of which is derived from renewable sources other than biomass.



Renewables



Biomass

Renewable hydrogen

Q&A implementation of hydrogen delegated acts

Version of 14/03/2024

Main criteria



Renewable
hydrogen

2. comply with the rules of the RED
for renewable electricity

- Delegated Act about H2 production



Additionality



Temporality



Geographic correlation

Renewable hydrogen

Q&A implementation of hydrogen delegated acts

Version of 14/03/2024

Main criteria



Renewable
hydrogen

3. achieve 70% emissions savings

(3,4 kgCO₂eq/kgH₂)



GHG emissions calculations

- Delegated Act about GHG emissions calculations

Renewable hydrogen

Q&A implementation of hydrogen delegated acts

Version of 14/03/2024

Main criteria



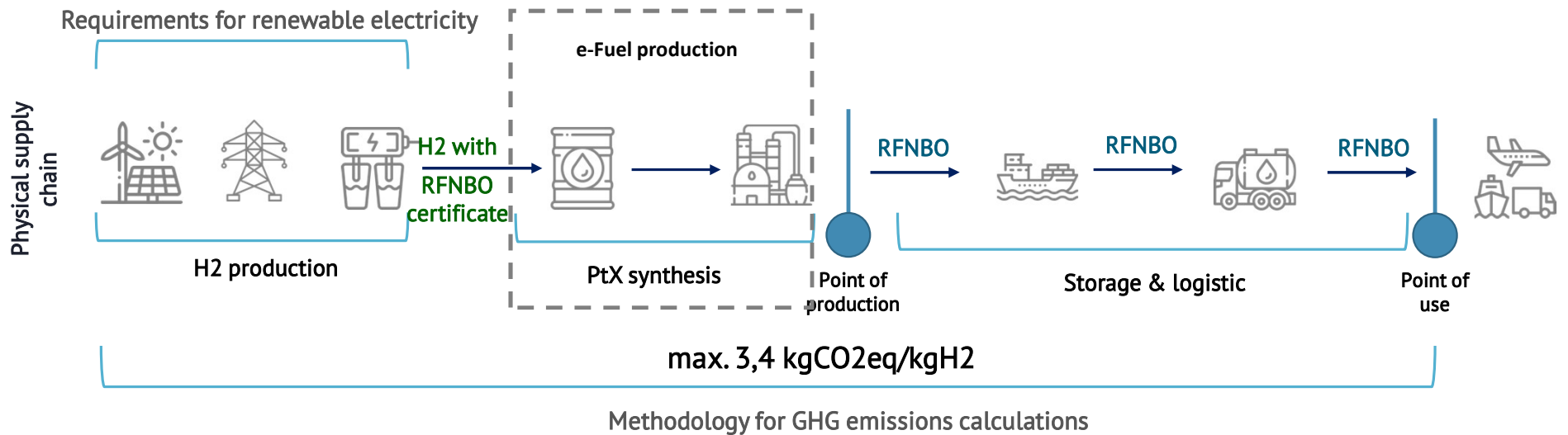
4. be traced through the supply chain in line with the rules of RED.



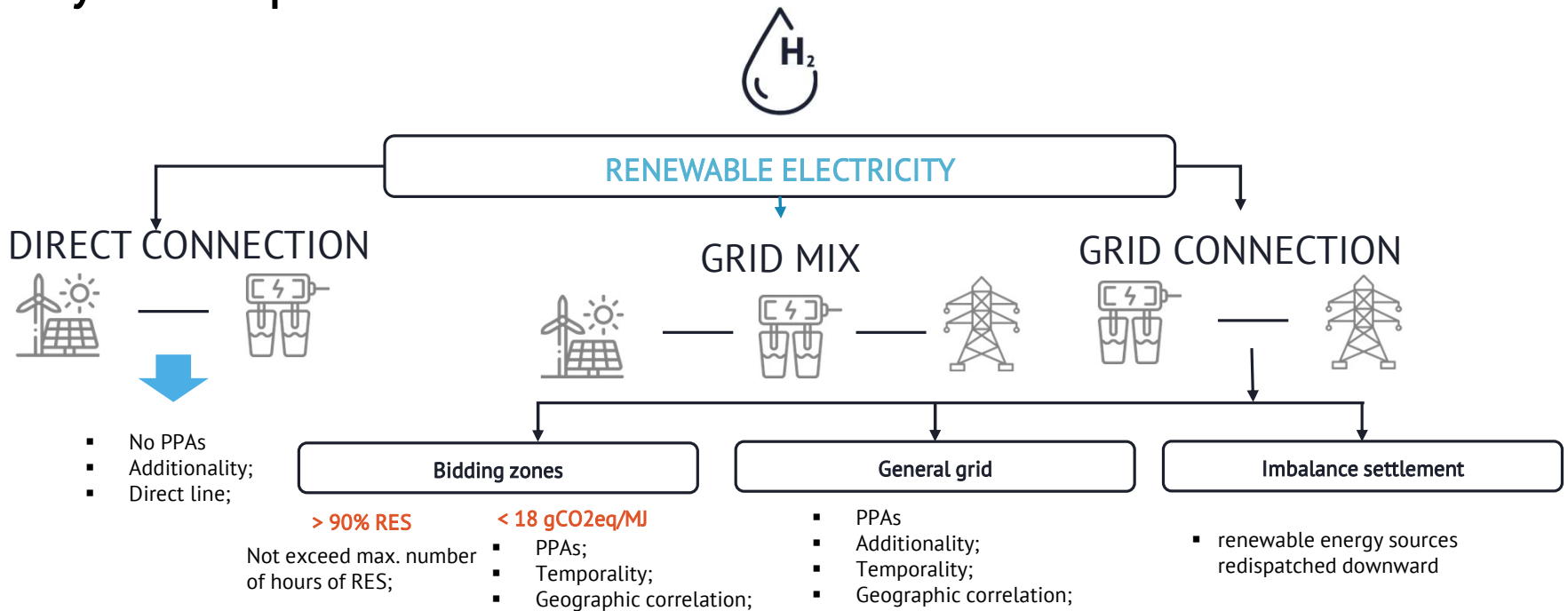
RFNBO Certification

- mandatory independent and transparent audits;
- to use a mass balance system;
- when the processing result in more than one output, for each output a separate conversion factor shall be applied and a separate mass balance shall be used

Physical supply chain for RFNBO certification

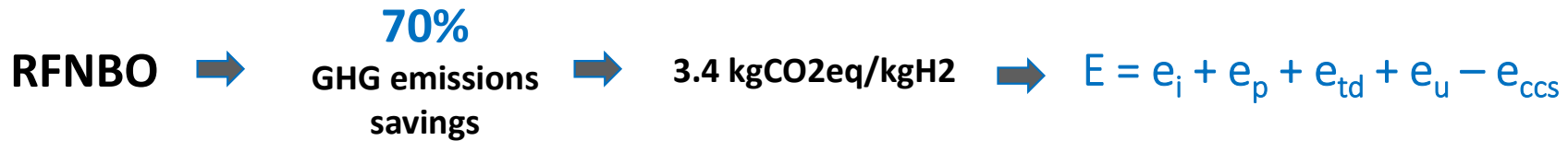


Requirements to renewable electricity for H2 production



ADDITIONALITY	TEMPORALITY	GEOGRAPHIC CORRELATION
<ul style="list-style-type: none"> RES capacity came into operation not earlier than 36 months before the RFNBO production facilities and did not receive support, Transition period: come into effect in 2028; exception until 2038 for installations coming into operation before 2028. 	<ul style="list-style-type: none"> Calendar month until 2030; Hourly correlation from 2030; 	RES installations are located in <ul style="list-style-type: none"> the same bidding zone; An interconnected offshore bidding zone; Interconnected bidding zones with higher or equal prices.

Delegated Act about GHG Methodology



$$\text{Savings} = (E_F - E) / E_F$$

where:

E = total emissions from the use of RFNBO.

E_F = total emissions from the fossil fuel comparator.

$E_F = 94 \text{ gCO}_2\text{eq/MJ}$.

E	total emissions from the use of the fuel (gCO ₂ eq / MJ fuel)
e_i	$e_{i \text{ elastic}} + e_{i \text{ rigid}} - e_{\text{ex-use}}$: emissions from supply of inputs (gCO ₂ eq / MJ fuel) $e_{i \text{ elastic}}$ = emissions from elastic inputs (gCO ₂ eq / MJ fuel) $e_{i \text{ rigid}}$ = emissions from rigid inputs (gCO ₂ eq / MJ fuel) $e_{\text{ex-use}}$ = emissions from inputs' existing use or fate (gCO ₂ eq / MJ fuel)
e_p	emissions from processing (gCO ₂ eq / MJ fuel)
e_{td}	emissions from transport and distribution (gCO ₂ eq / MJ fuel)
e_u	emissions from combusting the fuel in its end-use (gCO ₂ eq / MJ fuel)
e_{ccs}	emission savings from carbon capture and geological storage (gCO ₂ eq / MJ fuel)

Requirements to PPA

RED III



‘renewables power purchase agreement’ means a contract under which a natural or legal person agrees to purchase renewable energy **directly** from a producer, which encompasses, but is not limited to, renewables power purchase agreements and renewables heating and cooling purchase agreements.

Main requirements:



- The renewable PPAs need to clearly identify the **installations** that produce the amount of renewable electricity that is used to produce the renewable hydrogen.
- The electricity supplied under the PPA shall be effectively **produced**.

Low-carbon hydrogen

Hydrogen and decarbonized gas market package:

Directive on common rules for the internal markets for renewable gas, natural gas and hydrogen



'low-carbon hydrogen' means hydrogen:

- the energy content of which is derived from non-renewable sources,
- which meets **the GHG emission reduction threshold of 70%** compared to the fossil fuel comparator for RFNBO;



'low-carbon fuels' means:

- recycled carbon fuels (RCF),
- low-carbon hydrogen and
- synthetic gaseous and liquid fuels

the energy content of which is derived from low-carbon hydrogen, that meet the **GHG emission reduction threshold of 70 %** compared to the fossil fuel comparator for RFNBO;

EU Targets and Certification

EU targets for H2 in RED III

NEW TARGETS



Transport

- at least **1 %** in 2025 and **5,5 %** in 2030 share of advanced biofuels and RFNBO, of which at least 1% share of RFNBO in 2030;
- at least **1,2 %** share of RFNBO in the total amount of energy supplied to the maritime transport sector in 2030



Industry

- at least **42 %** of the hydrogen used for final energy and non-energy purposes in industry by 2030, and 60 % by 2035.

- **Amendments to Renewable Energy Directive (RED III):**

shall be transposed by EU Members Stated by 21 May 2025.

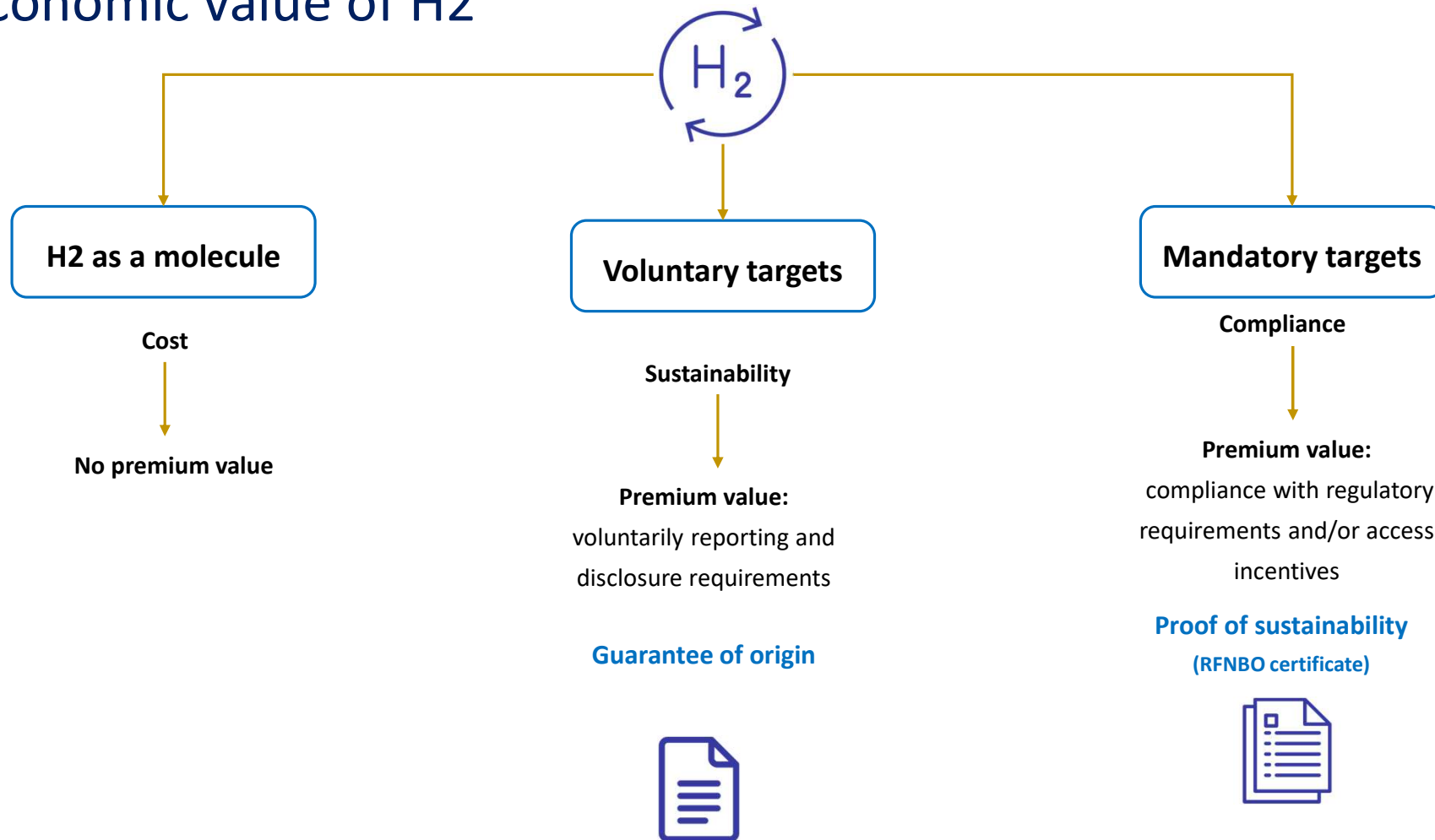


- RFNBO targets for transport will be confirmed by use of RFNBO certificates called „Proof of sustainability“ (PoS)


RED III <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32023L2413&qid=1699364355105>

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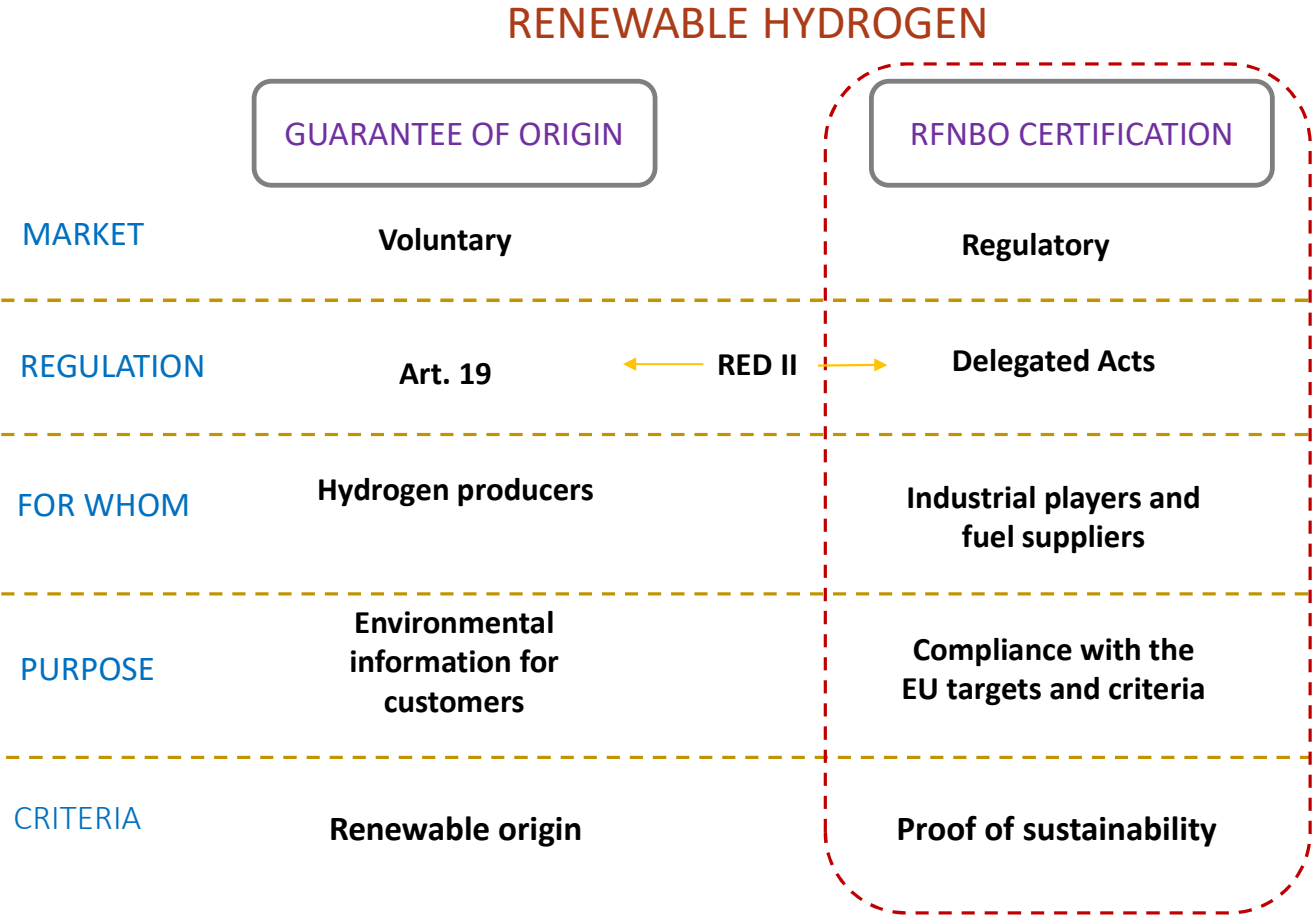
Economic value of H2



Classification of H2

RED II evaluation criteria		Classification and values for renewable H2				
Renewable	GHG emissions reduction	Type of H2	Compliance market	Voluntary market	Anticipated premium on the market	Comments
✓	✓	RFNBO (RED II)	✓	✓		RFNBO certification is required.
✓	X	Low-carbon H2		✓		<ul style="list-style-type: none"> ▪ GOs; ▪ Certificates for low-carbon H2;
X	✓			✓		
X	X	Electrolytic H2				Certificates are not required.

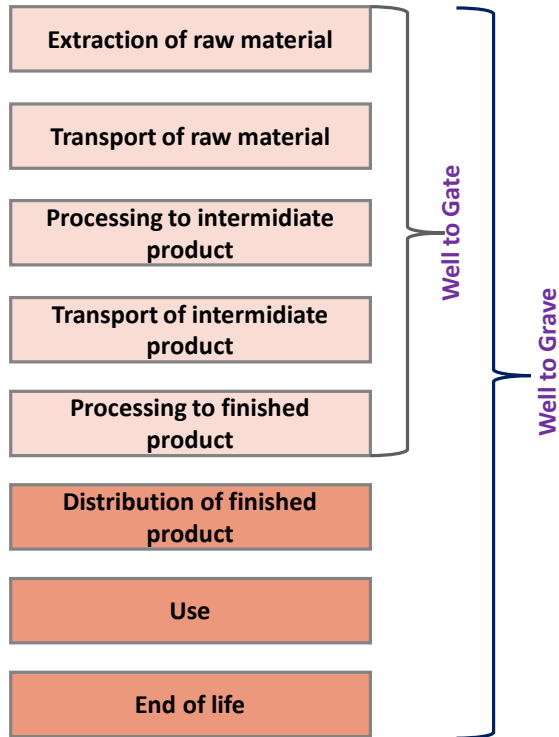
H2 certificates in the EU



Comparison of H2 certificates in the EU

Certificate	Issuance and cancelation	Legislative acts	Scope	Purpose
Guarantee of Origin (GO)	Book & claim	RED II <ul style="list-style-type: none"> ▪ Art 19 	<ul style="list-style-type: none"> ▪ Electricity ▪ Hydrogen ▪ Gas ▪ Heating and cooling 	Consumer disclosure
Proof of Sustainability (PoS)	Mass balancing	RED II: <ul style="list-style-type: none"> ▪ Art 25 ▪ Art 27 ▪ Art 30 	<ul style="list-style-type: none"> ▪ Advanced Biofuels (liquid, gaseous) ▪ Recycled Carbon Fuels (RCF) ▪ Renewable Fuels of Non-Biological Origin (RFNBO) 	Compliance

Attributes tracked in the EU H2 certificates



Certificates

Guarantee of Origin (GO)

Proof of sustainability

Attributes tracked by system

- **Source of renewable energy:**
 - Type of renewable energy (hydrogen)
 - Name, location and type of the generation unit
 - Information whether the energy was generated with state aid
 - Date of entering in operation of the production unit
 - **CEN EN standard 16325**
 - **Well to Gate**
-
- **Type of fuel**
 - **Compliance with the Sustainability criteria (including electricity attributes)**
 - **Well to Grave**

Hydrogen and decarbonized gas market package



How to start RFNBO certification



**Voluntary scheme,
recognised by the
European Commission**



**Certification
body**

**Certification schemes in process
of recognition:**

- CertifHy (RFNBOs)
- REDcert
- KZR INiG System
- CCEE Hydrogen and Derivatives Certification System

**Certification recognised by
certification scheme:**

- TÜV Süd
- Bureau Veritas

https://energy.ec.europa.eu/topics/renewable-energy/bioenergy/voluntary-schemes_en

Regulation for Hydrogen Projects

Hydrogen and decarbonized gas market package



- Regulation on the internal markets for renewable gas, natural gas and hydrogen;
- Directive on common rules for the internal markets for renewable gas, natural gas and hydrogen

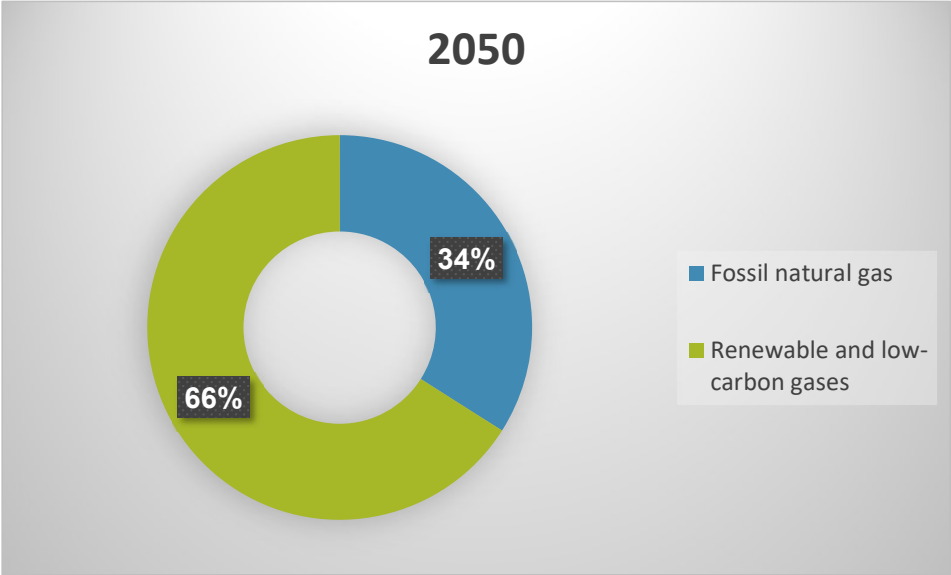
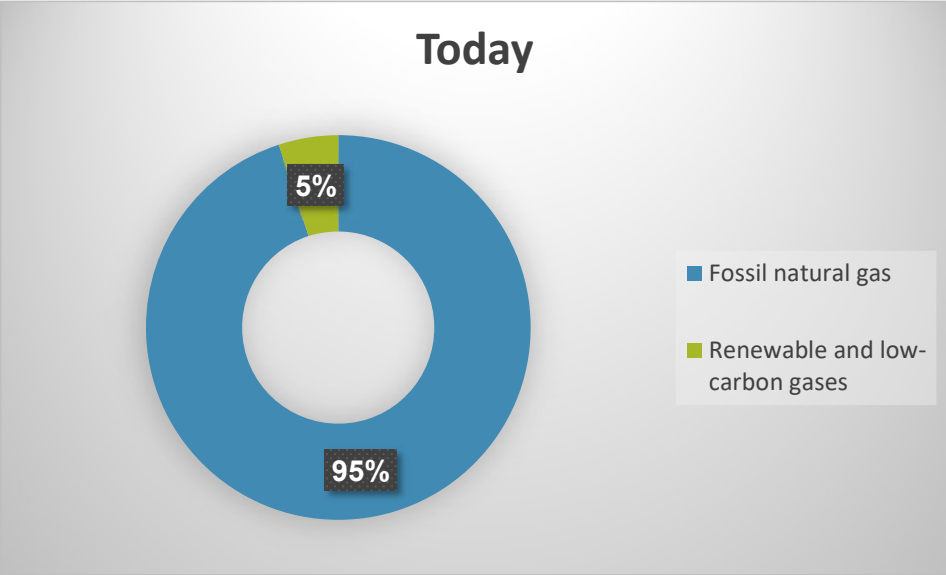
✓ Adopted by the European Parliament and the Council.

WHAT NEXT:

- Publication in the Official Journal of the European Union.
- The regulation will become directly applicable six months after its publication.
- As regards the directive, member states will have two years to adapt their national legislation to the provisions of the directive.

Hydrogen and decarbonized gas market package

Shift from fossil natural gas to renewable and low-carbon gases



Hydrogen and decarbonized gas market package

Renewable gases



- **Biogas**
- **Biomethane**



- **Renewable H2**
- **Synthetic methane**

Low-carbon gases

- **Not produced from renewable energy sources;**
- **Produce at least 70% less of GHG emissions.**

Hydrogen and decarbonised gas market package

Main rules

Creating of a market for H2

- EU market and H2 infrastructure;
- The European Network of Network Operators for H2;
- Trade with non-EU countries.

Integrated renewable and low-carbon gases into the grid

- Access to the gas grids
- Certification system;
- Monitoring of quality of gas.

Protecting consumers

- Ways to change energy provider;
- Transparent billing information;
- Access to smart meters.

Increasing security of supply

- Integrated planning for electricity, gas and h2 networks;
- Certification of storage system operators;
- Solidarity arrangements between EU countries, to deal with crisis situations.

Hydrogen and decarbonized gas market package



- Regulation on the internal markets for renewable gas, natural gas and hydrogen;
- Directive on common rules for the internal markets for renewable gas, natural gas and hydrogen



Establishment of a common framework for the decarbonisation of the markets for natural gas and hydrogen, in order to contribute to the achievement of the EU's climate and energy targets.



Definition of the main hydrogen infrastructure and the main rules for use it: hydrogen pipelines, hydrogen terminals, hydrogen storage facilities.



Definitions of low-carbon hydrogen and low-carbon fuels.



Certification of low-carbon hydrogen and low-carbon fuels.

Net-Zero Industry Act



✓ Adopted by the European Parliament and the Council

WHAT NEXT:

Publication in the Official Journal of the European Union.

<https://www.consilium.europa.eu/en/press/press-releases/2024/05/27/industrial-policy-council-gives-final-approval-to-the-net-zero-industry-act/>



The net-zero technologies within the scope of the NZIA include the following:

- sustainable alternative fuels technologies;
- renewable fuels of non-biological origin technologies;
- CO₂ transport and utilisation technologies;



Net-zero Acceleration Valleys to create clusters of net-zero industrial activity and to further streamline administrative procedures.



Acceleration CO₂ capture and storage in the EU

Net-Zero Industry Act

Streamlining administrative processes



Single points of contact:

- responsible for facilitating and coordinating the permit-granting process;
- sole point of contact for the project promoter in the permit-granting process;
- responsible for any step along the permit-granting processes, including all procedural steps.



Fast permit-granting process:

- 12 months for projects less than 1 GW;
- 18 months for projects more than 1 GW.



Online accessibility of information:

- the single points of contact;
- the permit-granting process;
- financing and investment services, funding possibilities;
- business support services, including but not limited to corporate tax declaration, local tax laws or labour law.



Accelerating implementation:

- assistance with regard to compliance with applicable administrative and reporting obligations;
- assistance to project promoters to inform the public with the aim of increasing public acceptance of the project;
- assistance to project promoters along the permit-granting process, in particular for SMEs.

Net-Zero Industry Act

Regulatory framework for the market for captured CO₂



The European Commission shall carry out an assessment of the functioning of the market for captured CO₂:

- the obligations effectively promote the development of the CO₂ storage market in the Union;
- the market provides for open, fair and non-discriminatory access and safety of the CO₂ storage, transport network, capture CO₂ for usage or storage purposes;
- the adequacy of the CO₂ transport network and other infrastructure;
- the functioning of the CO₂ market ensures sufficient access to injection capacity for hard-to-abate CO₂ emissions.

The European Commission may propose a legislative act to regulate the market.