

Enabling Measures Roadmap for Renewable Hydrogen



Europe

Version: July 2023

Executive Summary (1/2)

The European Union has pledged to reduce GHG emissions by 55% by 2030 (compared to 1990 levels) and to achieve carbon neutrality by 2050. As one of the top five consumers of energy globally, and the world's third largest economy, Europe's transition to Net Zero will be significant for global efforts to achieve the Paris Agreement targets. **Renewable hydrogen** has been identified in [REPowerEU](#) as one of the [main levers to help decarbonize the EU in a cost-effective way and to reduce dependence on imported fossil fuels](#).

This report by the World Economic Forum, in collaboration with Accenture, is an updated version of the [Enabling Measures Roadmap for Green* Hydrogen](#) released after COP26 (January 2022). The purpose of the initial Roadmap was to identify key enablers to achieve a scaled and traded renewable hydrogen market.

The goal of this updated Roadmap is two-fold:

1. To **identify policy developments, funding and initiatives** related to renewable hydrogen in Europe.
2. To **take stock of the current progress** made towards previously defined objectives and associated timeline.

**This version of the Roadmap uses the term "renewable" hydrogen – as compared to the previous version's term 'green' hydrogen – as the European Commission recently defined the priority of Europe as being renewable hydrogen with REPowerEU.*

First, an overview and timeline of the key European strategies and legislations, financial instruments and institutions related to renewable hydrogen are presented; highlighting multiple updates since the release of the initial Roadmap in January 2022 and a multifaceted EU funding and institutions landscape. Together the presented policy measures and funding instruments will contribute to providing the much-needed attractive policy framework and investment climate for realizing the value potential of renewable hydrogen.

More details on these policy updates are presented in the section "Reference Library: Key Europe Policy Update":

1. [REPowerEU](#): sets the target to produce 10 Mt of domestic renewable hydrogen, as well as to gain another 10 Mt of imported renewable hydrogen by 2030.
2. [Green Industrial Plan for Net-Zero Age](#): enables Europe to lead the way globally in the Net Zero industrial age.
3. [EU-ETS Revision](#): sets more ambitious targets for 2030 by decreasing free allowances and including new sectors such as maritime and transport sector.
4. [CBAM](#): prevents carbon leakage associated with the EU-ETS carbon market extension to other heavy industries. A pilot phase will launch in Autumn 2023.
5. [Common Market Rules for Future Gas](#) (proposed)

[and Hydrogen Market](#): creates conditions to transition the European gas market while protecting consumers and promoting competitiveness to advance towards Net Zero.

6. [RED II Revision](#): raises the targets for renewable energy and use of renewable fuels of non-biological origin (RFNBO) across the transport and industry sectors.
7. [Two Delegated Act for Renewable Fuels of Non-Biological Origin](#) (RFNBO): define the methodology under which conditions hydrogen fuels and other energy carriers can be considered to be "renewable" and clarified the GHG calculation methodology for RFNBOs.
8. [Net-Zero Industry Act](#) (proposed): ensures a competitive Net Zero technology manufacturing ecosystem in Europe.
9. [Critical Raw Materials Act](#) (proposed): ensures a secure and resilient supply chain for critical raw materials required in the manufacturing of Net Zero technologies.
10. [European Hydrogen Bank](#) (proposed): streamlines and accelerates investments for hydrogen projects.

In order to realize the maximum value potential of renewable hydrogen, notably, the presented policies are cognizant in addressing **the role renewable hydrogen can play within the wider energy system**, leveraging its key traits compared to other main energy carriers.

Executive Summary (2/2)

Next, the 2030 objectives and enabling measures identified in the 2022 Roadmap are assessed against current developments as following:

- **Cost:** The energy crisis has led to the accelerated definition of a regulatory framework for the energy transition, including measures to decrease the cost gap between renewable hydrogen and fossil fuels.
- **Standards & Certification:** With the [Delegated Act](#), criteria for RFNBOs have been adopted and the European Hydrogen Alliance has launched a roadmap on hydrogen standardisation.
- **Demand:** The European Commission is currently supporting major renewable projects – 2 [IPCEIs](#) – and setting targets to produce (10 Mt) and import (10 Mt) renewable hydrogen with [REPowerEU](#). To ensure off-take for the production and import targets, **an indispensable steppingstone will be greening the existing hydrogen demand** within industrial clusters.
- **Infrastructure:** The European Commission has identified 3 potential ‘[Hydrogen Supply Corridors](#)’ which can connect local and external supply and demand, and serve as focal points for hydrogen development.
- **Pace of Development:** The European Commission aims to accelerate electrolyser manufacturing and facilitate economies of scale via its [Electrolyser Partnership platform](#) and the [Net Zero Industry Act](#).
- **Technology:** Europe filed 28% of all international hydrogen patent families in 2011-2020, and in order to continue that trend the European Commission has increased hydrogen R&D funding via [REPowerEU](#).

- **Available Clean Electricity:** More ambitious renewable energy targets have been set which indirectly benefit hydrogen development, and clarity has been provided on [additionality rules for RFNBOs](#).

Upon reviewing the various enabling measures in place, it is evident that Europe has made substantial progress towards meeting its 2030 objectives to establish a scaled renewable hydrogen market. To ensure that these efforts translate into achieving the 2030 objectives, it is crucial to **transform the pipeline of announced renewable hydrogen projects into committed Final Investment Decisions (FIDs)**. A number of enabling measures can be further actioned and accelerated to support the scale-up of the hydrogen market in Europe, including:

1. **Create one-stop-shop for hydrogen finance:** the collaboration facilitated by the [European Clean Hydrogen Alliance and its partnership with the European Investment Bank](#), [IPCEIs](#), the upcoming launch of the [European Hydrogen Bank](#) and development of the [European Hydrogen Funding Compass](#) all drive progress towards the realisation of this enabling measure.
2. **Provide Fiscal Incentives for Green Products:** Tax differentiations ([EU-ETS](#)) and tax reliefs ([Energy Taxation Directive](#)) have been introduced and will be strengthened to drive demand for green products (e.g. free allowances phase out in EU-ETS and pilot phase of [CBAM](#) for import).

3. **Set clear carbon intensity definitions, thresholds, boundaries for hydrogen production:** both discretionary guidelines and recently proposed legislation from the EU and private sector actors (e.g. the [Delegated Acts on RFNBOs](#) and for a minimum threshold for GHG savings of recycled carbon fuels, as well as the European Clean Hydrogen Alliance’s [roadmap for standardization](#)) contribute towards the achievement of this enabling measure.

Finally, to accelerate renewable hydrogen market development in Europe, it will be important to continue the current path by following these guiding principles:

- Ensuring legislation is **future-proof and flexible** by regularly reviewing and revising laws to account for technological and market changes.
- Developing **global standards** to maintain a level playing field for businesses in different countries, and to facilitate international trade.
- Providing investors with **legal certainty** by establishing clear and consistent guidelines.
- Promoting development of **practical tools** which empower industry players to navigate the diverse funding and regulatory environment.
- Exploring use of **regulatory “sandboxes”** to allow for innovative solutions to be tested in a controlled environment prior to market deployment.
- Fostering **collaboration and knowledge-sharing** between stakeholders to identify and remove regulatory and non-regulatory barriers which hinder innovation and growth.

Table of Contents

1 [Accelerating Clean Hydrogen Initiative](#)

2 [Key Policy and Funding Updates](#)

3 [Roadmap Progress Update](#)

4 [Reference Library: Key Policy and Funding Updates](#)

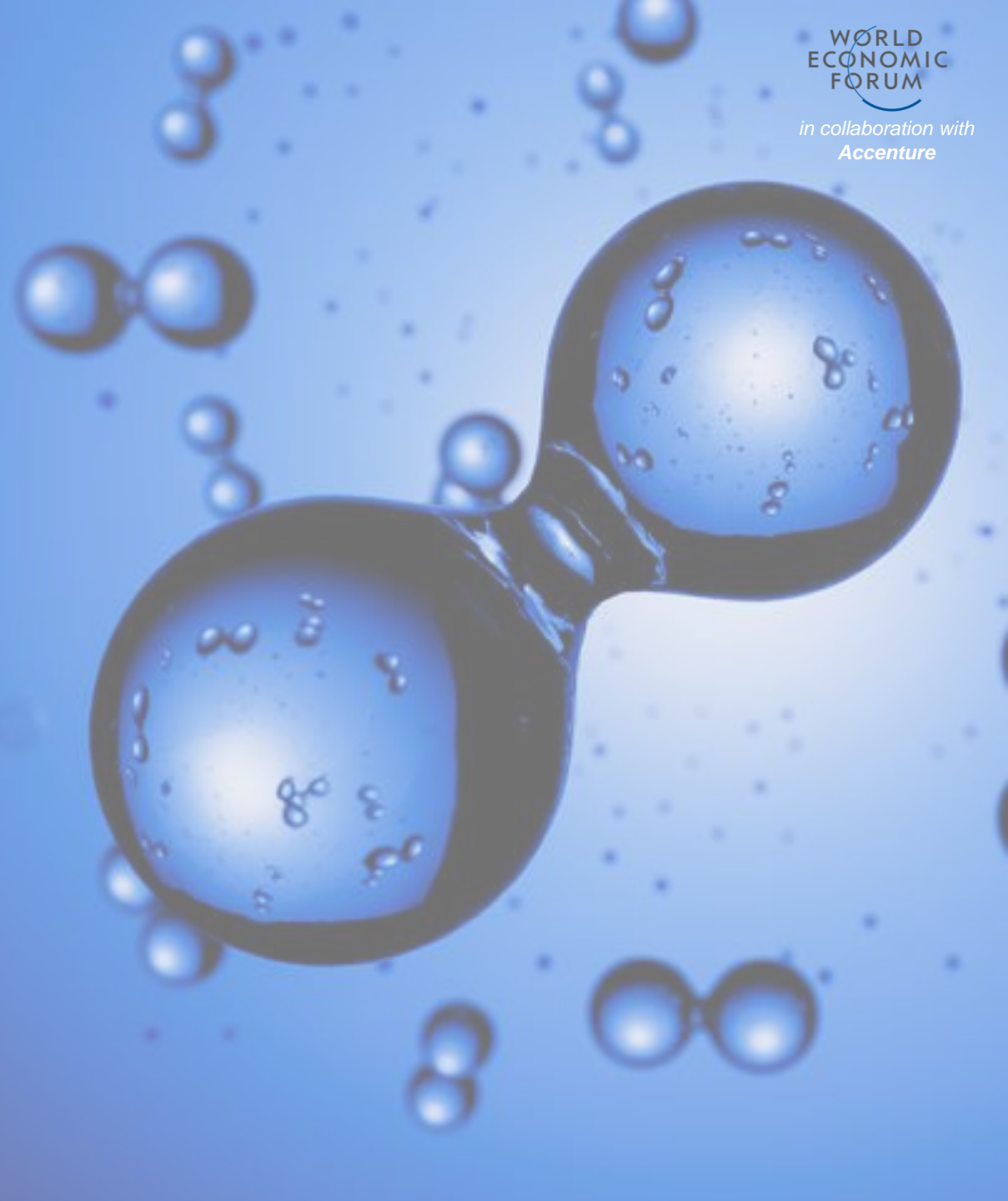


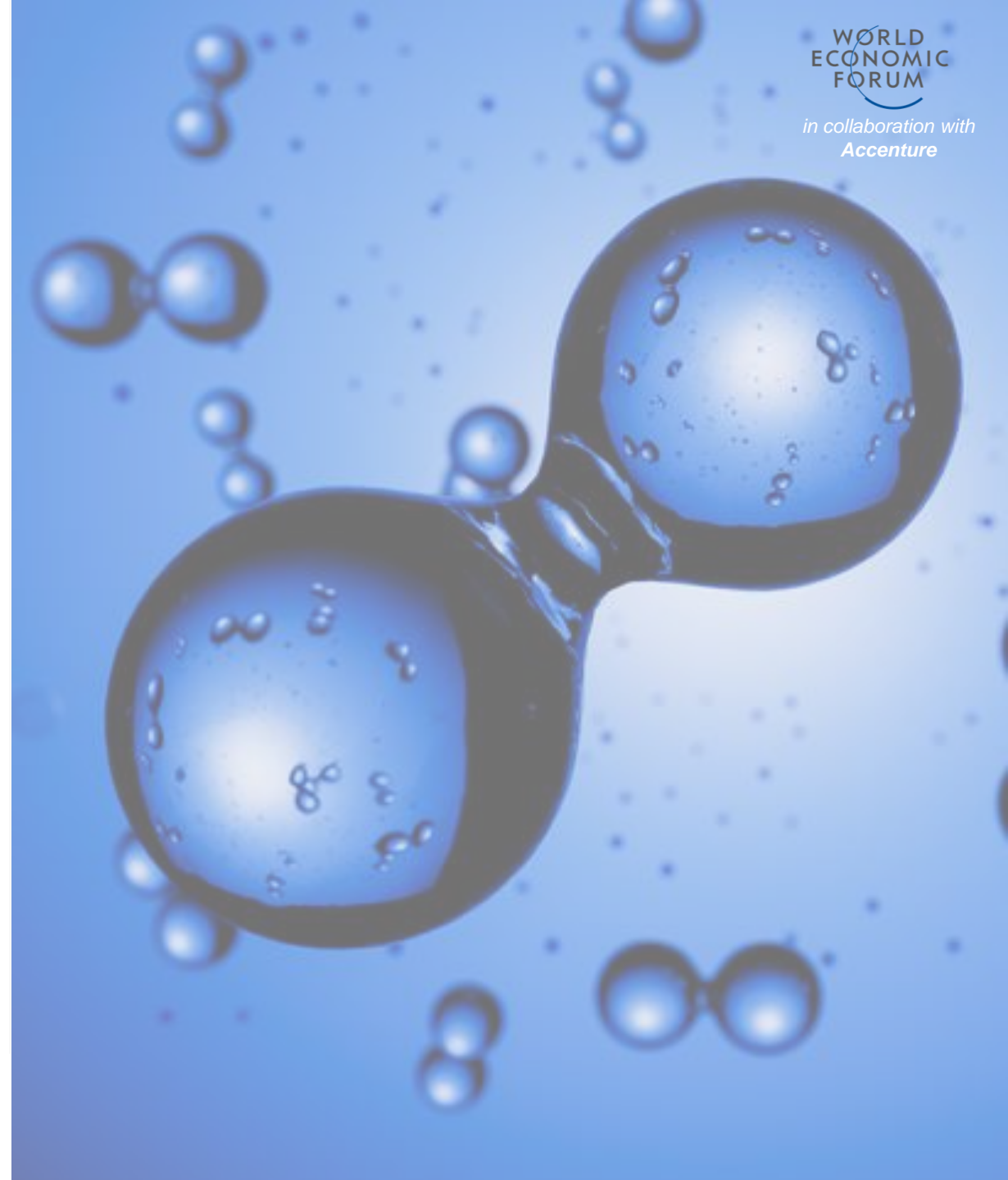
Table of Contents

1 [Accelerating Clean Hydrogen Initiative](#)

2 [Key Policy and Funding Updates](#)

3 [Roadmap Progress Update](#)

4 [Reference Library: Key Policy and Funding Updates](#)



Since 2020, the World Economic Forum in Collaboration with Accenture is Driving the Acceleration of Clean Hydrogen

Focus of report

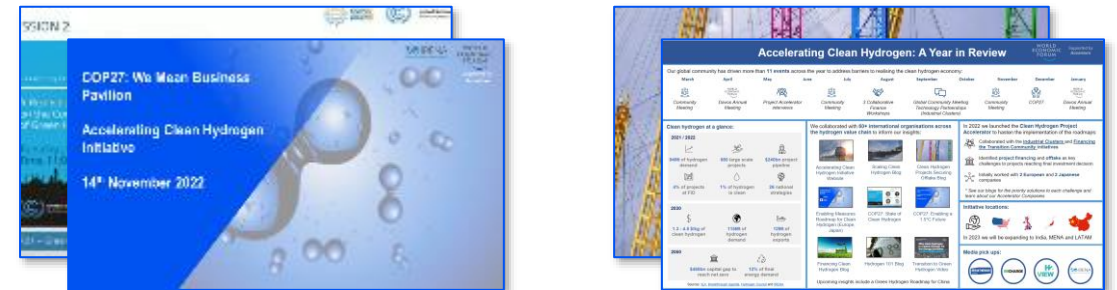
1: Enabling Measures Roadmap

- The Roadmap identifies measures required to boost the clean hydrogen economy and enhance public-private dialogue.
- The Roadmap focuses on the 7 barriers to market development and enabling measures to overcome them.
- The initial Roadmaps were launched at COP26 to scale the clean hydrogen market in Europe and Japan; further regions are included in 2023.
- This report is the **updated version** of the initial [Enabling Measures Roadmap for Green* Hydrogen](#).



2: Clean Hydrogen Project Accelerator

- The Accelerator accelerates implementation of the Roadmaps by coalescing stakeholders across policy, finance and industry.
- The Accelerator explores project financing and clean hydrogen offtake as key challenges to projects approaching final investment decisions.
- Initially worked with 2 European and 2 Japanese projects across the value chain, looking to further expand that approach in 2023.



**The term “green” hydrogen has been replaced by the term “renewable” hydrogen as the European Commission recently defined the priority of Europe as being renewable hydrogen.*

Objectives of Updating the Enabling Measures Roadmap

The Roadmap is a toolbox for policy makers, identifying the top ten enabling measures and critical timelines required to achieve a renewable hydrogen market at scale.

The objective of this updated Roadmap is two-fold:

1. EU Hydrogen Policy and Funding Landscape

To identify policy developments, funding and initiatives related to renewable hydrogen in Europe.



2. EU Roadmap Progress Update

To take stock of the current progress made towards previously defined objectives and associated timeline.



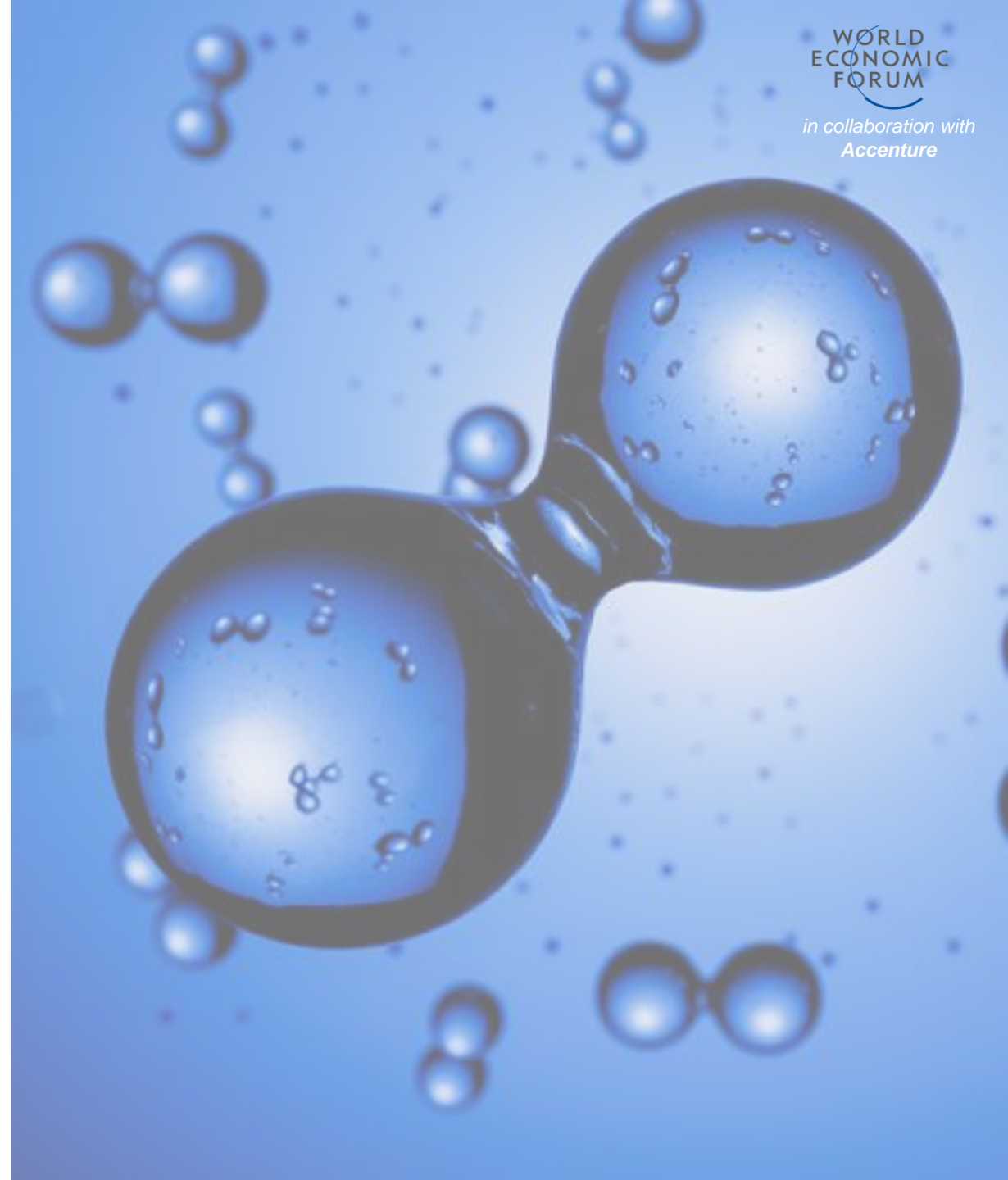
Table of Contents

1 [Accelerating Clean Hydrogen Initiative](#)

2 [Key Policy and Funding Updates](#)

3 [Roadmap Progress Update](#)

4 [Reference Library: Key Policy and Funding Updates](#)



Unlocking the Hydrogen Potential: Navigating Policy Frameworks and Financial Mechanisms

The EU’s key renewable hydrogen targets for 2030 include a 10 Mt production target and a 10 Mt import target, effectively resulting in a 20 Mt off-take of renewable hydrogen by 2030¹. Currently, planned renewable hydrogen production projects are already approaching the [10 Mt](#) production target by 2030². However, only 5% of planned projects have reached Final Investment Decision (FID)². To overcome the hurdle of attaining FID, both the presence of an attractive policy framework as well as the availability of appropriate (public) funding mechanisms – across the value chain – is required. Hence, in this document we provide an overview of both the policy measures and funding and initiatives that will support the renewable hydrogen market development.

Policy

The EU’s policy framework for renewable hydrogen value chain development consists of a multi-layered regulatory framework that addresses the **specific role renewable hydrogen can play in the EU’s wider energy system**. In our overview we elucidate how the layers relate to one another and provide insight into what each policy measure incorporates.

Overarching Strategic Vision

Policy Framework

Legislation

Funding and Initiatives

To green existing hydrogen value chains and develop new ones, **announced projects must move towards FID** (incl. production, transport, distribution and end-use projects). Public funding instruments and initiatives can contribute to achieving business cases and work as a lever to attract private capital investments.

Financial Instruments

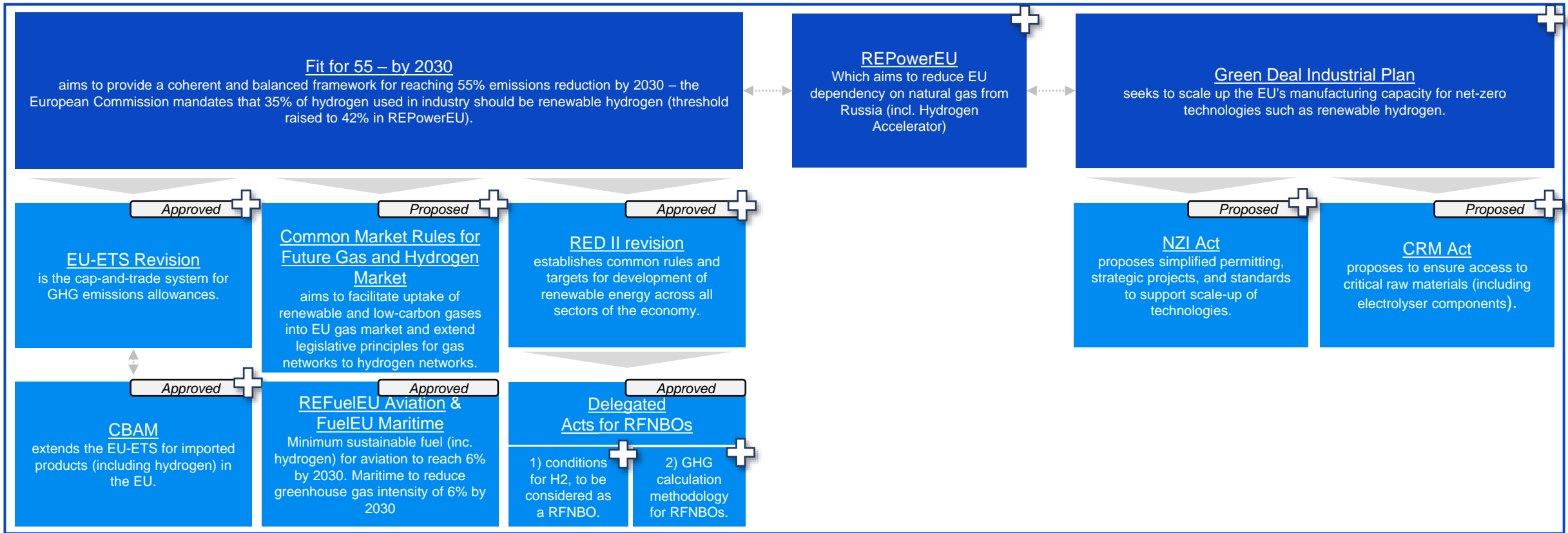
Public-Private Partnerships

Find in the [“Reference Library: Key Policies Update – Europe”](#) section the detailed description of all updates.

Source: (1) REPowerEU; (2) [Hydrogen Europe, Clean Hydrogen Monitor 2022](#).

Overview: Policies supporting the EU Renewable Hydrogen Market *(Non-Exhaustive)*

Green Deal – by 2050
 aims to set the EU on the path to a green transition, with the goal of reaching climate neutrality by 2050 – renewable hydrogen is a key pillar of this package as it promotes the uptake of renewable fuels, such as hydrogen in industry and transport, with additional targets.



Source: links are in the titles of the policy and legislative boxes

KEY:

Overarching Strategic Vision	Policy Framework	Legislation
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All initiatives marked with a 'plus' symbol were created or amended after the publication of the original Roadmap. A 'Reference' slide is included in the [Reference Library](#) section.

Overview: Funding and Initiatives supporting the EU Renewable Hydrogen Market *(Non-Exhaustive)*

<p>EU Hydrogen Bank New +</p> <p>was launched in March 2023 to stimulate investment in sustainable hydrogen production and help the EU to achieve its REPowerEU targets. With an overall budget of €3 billion, €800 million will be available for the first funding call in late 2023.</p>	<p>Invest EU</p> <p>provides a budgetary guarantee to the EIB Group and selected partners with the aim to facilitate access to finance for riskier projects. It aims to mobilise more than €372 billion of public and private investment via an EU budget guarantee of €26.2 billion.</p>	<p>Horizon Europe</p> <p>is the EU's key funding programme for research/innovation. Pillars II and III focus on deployment of low-carbon industry applications and breakthrough technologies, incl. hydrogen. €93.5 billion has been allocated for the period 2021-2027.</p>	<p>LIFE Programme</p> <p>is the only EU fund dedicated to environment, climate and energy, incl. the Clean Energy Transition sub-programme which applies to hydrogen technologies. €5.43 billion is allocated for the period 2021-2027, with €1.94 billion reserved for the field of climate action.</p>	
<p>Innovation Fund</p> <p>is one of the world's largest funding programmes for demonstration of innovative low-carbon technologies, incl. production and use of low-carbon/renewable hydrogen. Being funded by EU-ETS revenues, this variable fund will provide approx. €38 billion from 2020-2030.</p>	<p>Modernisation Fund</p> <p>is a fund supporting lower-income EU countries' transitions to Net Zero via modernisation of their energy systems and improved energy efficiency. The budget is variable as it is sourced from EU-ETS revenues/beneficiary states' own contributions and may amount up to €48 billion from 2021-2030.</p>	<p>Just Transition Fund</p> <p>is one of the EU's Cohesion Policy funds, aiming to reduce the social and economic impact of the transition to Net Zero. €19.32 billion is allocated for this fund, of which €10.87 billion comes from the NextGenerationEU fund.</p>	<p>European Regional Development Fund, Cohesion Fund, REACT-EU</p> <p>are part of the EU's Cohesion Policy, supporting innovation in the transition to Net Zero. Together, these funds will invest €234 (respectively, €191 billion via ERDF and €43 billion through CF).</p>	
<p>Recovery and Resilience Facility</p> <p>is the centrepiece of the NextGenerationEU recovery plan, which aims to make EU economies and societies more sustainable by supporting green and digital transition. The fund allocates €723.8 billion in loans and grants for that purpose.</p>	<p>Connecting Europe Facility (Energy)</p> <p>is a funding instrument for targeted energy infrastructure investment at a European level. €5.84 billion is allocated for the period 2021-2027, aiming to accelerate the transition towards Net Zero.</p>	<p>Connecting Europe Facility (Transport)</p> <p>is a funding instrument for targeted transport infrastructure investment at European level. €25.81 billion (including €11.29 billion for cohesion countries) is allocated for the period 2021-2027.</p>	<p>Member State Fund</p> <p>There are various examples of schemes via which member states internally administer funds to accelerate their respective transitions to Net Zero, e.g. in April 2023, Italy notified the European Commission of its plans, under the Temporary Crisis Transition Framework, to invest €450m to develop integrated production of renewable electricity and hydrogen.</p>	
<p>European Clean Hydrogen Alliance</p> <p>brings together actors across the clean hydrogen value chain to support large-scale deployment of clean hydrogen technologies by 2030.</p>	<p>European Hydrogen Backbone</p> <p>is a group of 32 energy infrastructure operators aiming to accelerate decarbonisation by developing hydrogen infrastructure to connect regions of supply potential with centres of demand.</p>	<p>Clean Hydrogen Partnership</p> <p>is a unique public-private partnership supporting R&D in hydrogen technologies in Europe, and consisting of the European Commission, Hydrogen Europe and Hydrogen Europe Research.</p>	<p>Clean Tech Europe</p> <p>aims to bridge the gap between the EU cleantech community, venture capital, and policy-makers.</p>	<p>Clean Energy Industrial Forum</p> <p>aims to strengthen the industrial basis in Europe to support the clean energy transition and consolidate the EU's value chain for clean energy technologies.</p>

Source: links are in the titles of the financial instruments and Industry bodies

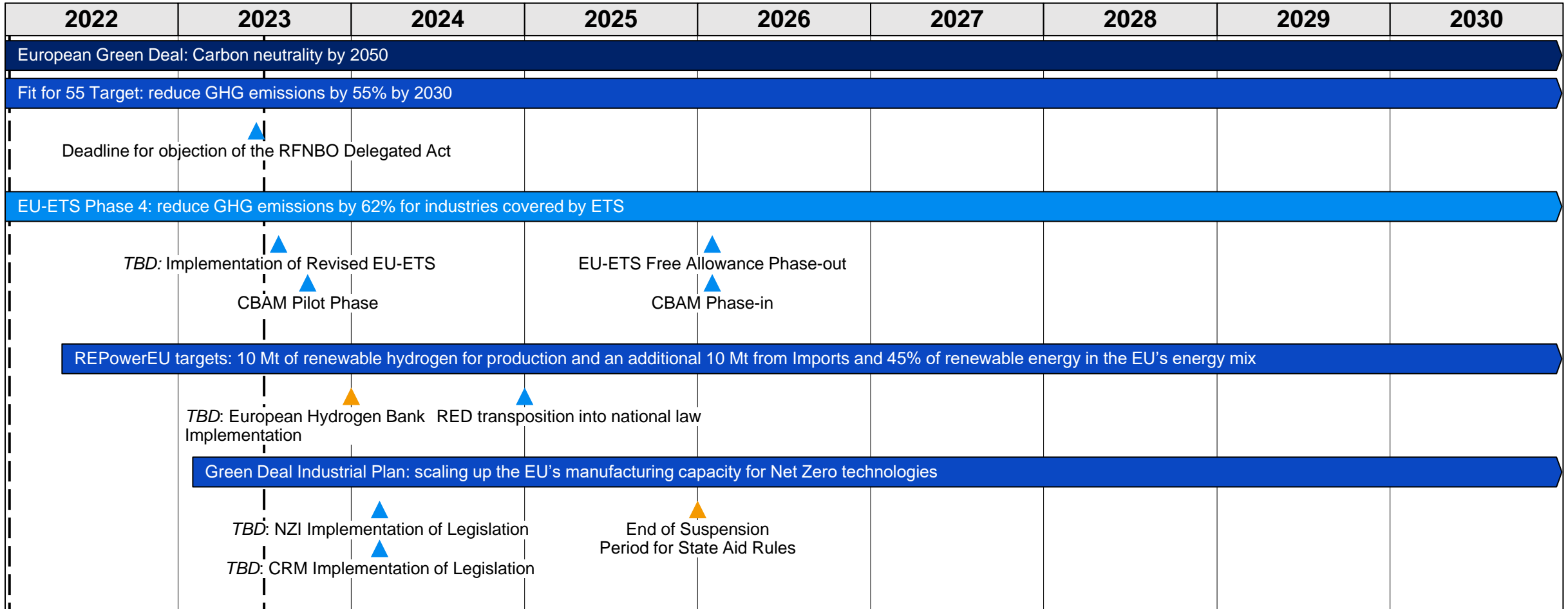
KEY:

Financial Instrument

Public-Private Partnerships

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Upcoming Policy Timeline



Original Roadmap

Updated Roadmap publication

KEY:

- Overarching Strategic Vision
- Policy Framework
- Legislation
- Financial Instrument
- Public-Private Partnerships

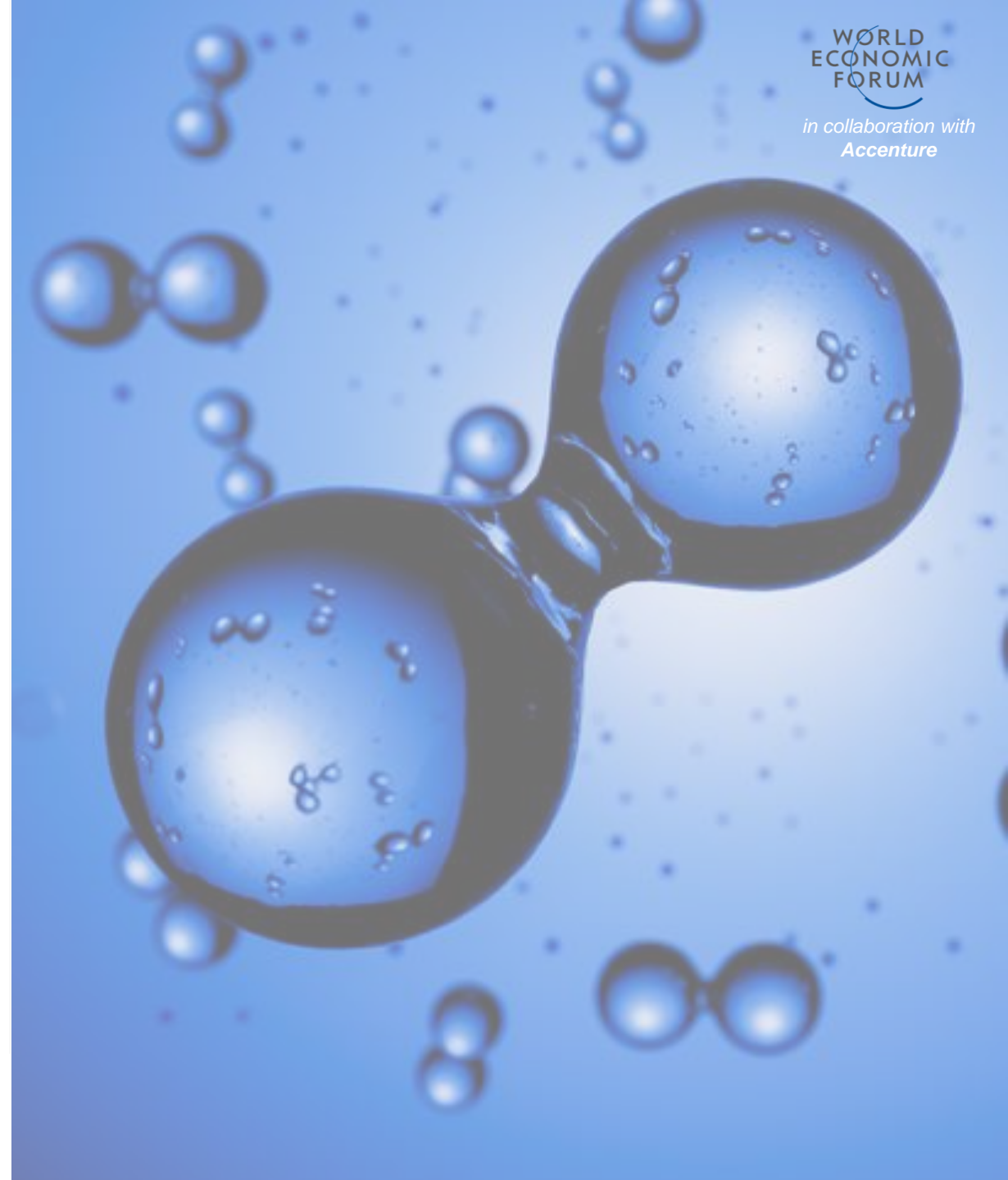
Table of Contents

1 [Accelerating Clean Hydrogen Initiative](#)

2 [Key Policy and Funding Updates](#)

3 [Roadmap Progress Update](#)

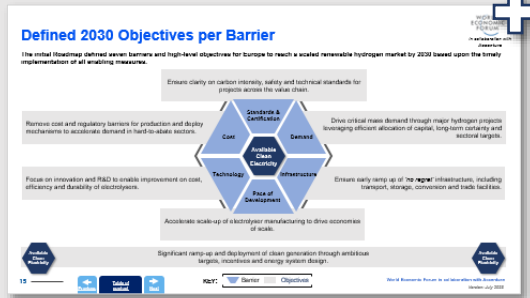
4 [Reference Library: Key Policy and Funding Updates](#)



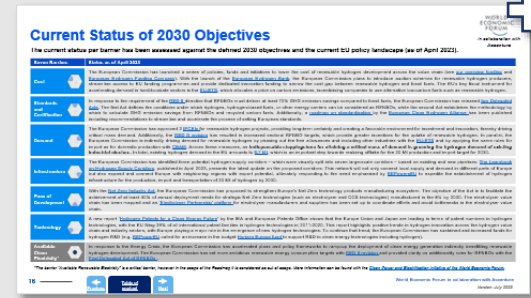
Navigating the Updated Roadmap

This updated Roadmap analyses the previously defined enabling measures timeline against the current European hydrogen policy landscape. In this section, the Roadmap's current status has been assessed through four steps:

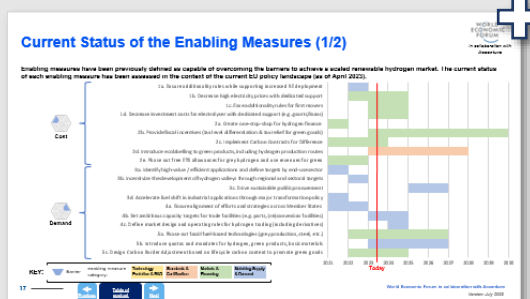
Step 1: Reintroduce the defined 2030 objectives per barrier



Step 2: Assess current status per barrier against the objectives



Step 3: Review the timeline of enabling measures

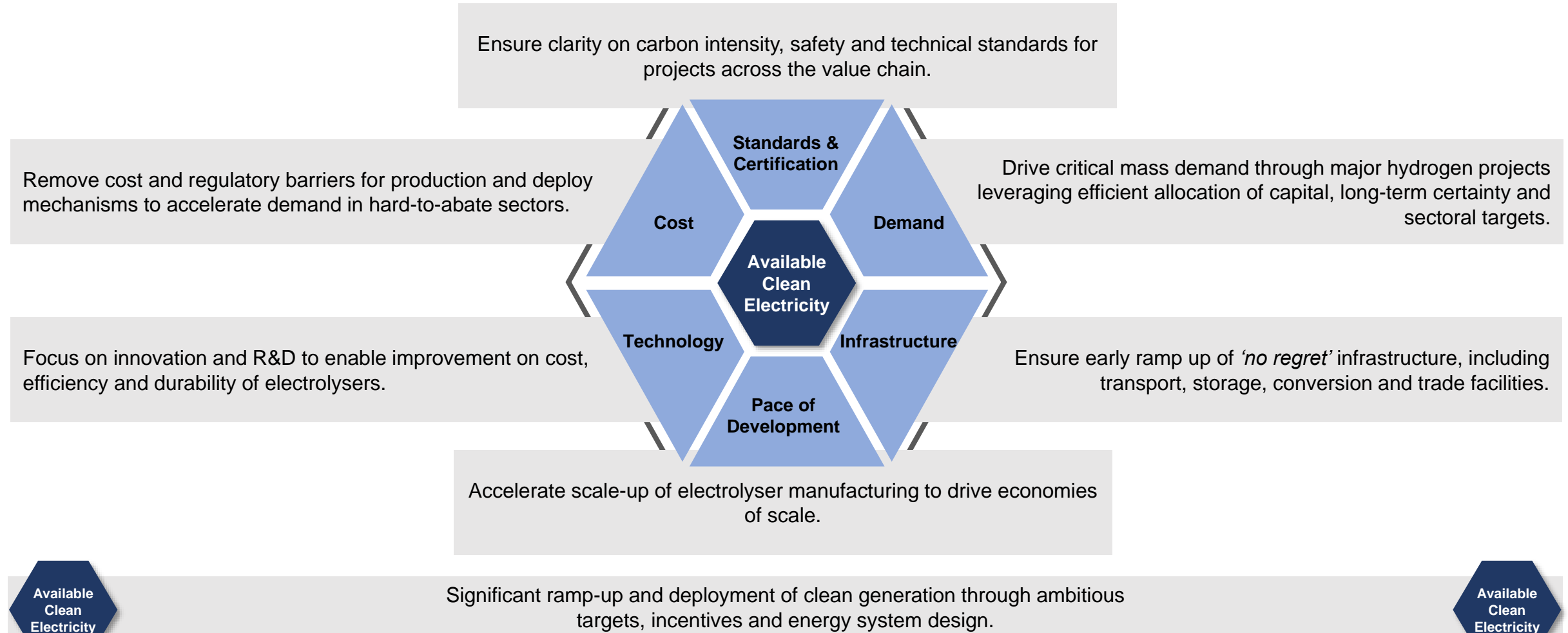


Step 4: Progress to the next level










Defined 2030 Objectives per Barrier

The initial Roadmap defined seven barriers and high-level objectives for Europe to reach a scaled renewable hydrogen market by 2030 based upon the timely implementation of all enabling measures.



Current Status of 2030 Objectives

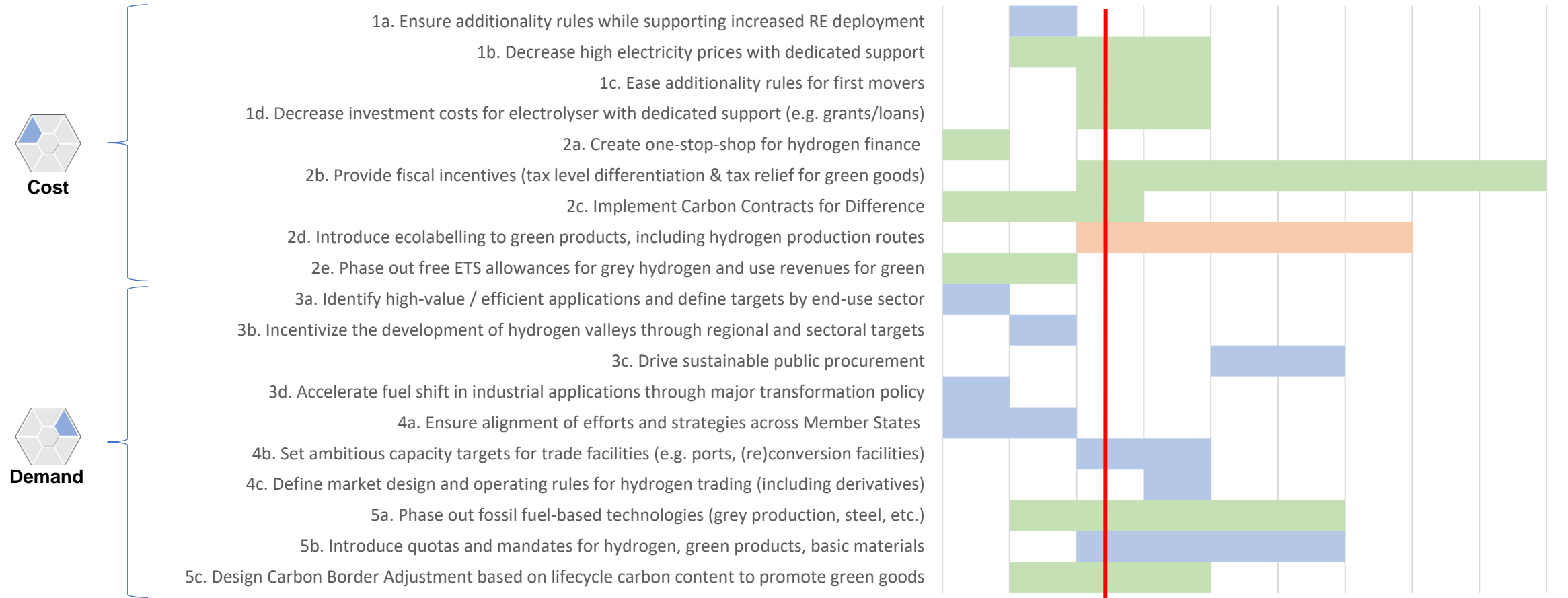
The current status per barrier has been assessed against the defined 2030 objectives and the current EU policy landscape (as of April 2023).

Seven Barriers	Status as of April 2023
Cost 	<p>The European Commission has launched a series of policies, funds and initiatives to lower the cost of renewable hydrogen development across the value chain (see our overview funding and European Hydrogen Funding Compass). With the launch of the European Hydrogen Bank, the European Commission plans to introduce auction schemes for renewable hydrogen producers, streamline access to EU funding programmes and provide dedicated innovation funding to narrow the cost gap between renewable hydrogen and fossil fuels. The EU's key fiscal instrument for accelerating demand in hard-to-abate sectors is the EU-ETS, which allocates a price on carbon emissions, incentivising companies to use alternative low-carbon fuels such as renewable hydrogen.</p>
Standards and Certification 	<p>In response to the requirement of the RED II directive that RFNBOs must deliver at least 70% GHG emission savings compared to fossil fuels, the European Commission has released two Delegated Acts. The first Act defines the conditions under which hydrogen, hydrogen-based fuels, or other energy carriers can be considered as RFNBOs, while the second Act establishes the methodology by which to calculate GHG emission savings from RFNBOs and recycled carbon fuels. Additionally, a roadmap on standardisation by the European Clean Hydrogen Alliance has been published including recommendations to streamline and accelerate the process of setting European standards.</p>
Demand 	<p>The European Commission has approved 2 IPCEIs for renewable hydrogen projects, providing long-term certainty and creating a favorable environment for investment and innovation, thereby driving critical mass demand. Additionally, the RED II revision has resulted in increased sectoral RFNBO targets, which provide greater incentives for the uptake of renewable hydrogen. In parallel, the European Commission is indirectly driving demand for renewable hydrogen by phasing out the free allowances and including other industries with the EU-ETS and by applying the same rules for import as for domestic production with CBAM. Across these measures, an indispensable steppingstone for attaining a critical mass of demand is greening the hydrogen demand of existing industrial clusters. In total, existing hydrogen demand in the EU amounts to 8.7 Mt, which is an important step towards realizing offtake for the 20 Mt production and import target for 2030.</p>
Infrastructure 	<p>The European Commission has identified three potential hydrogen supply corridors – which were visually split into seven large-scale corridors – based on existing and new pipelines. The Learnbook on Hydrogen Supply Corridors, published in April 2023, presents the latest update on the proposed corridors. This network will not only connect local supply and demand in different parts of Europe but also expand and connect Europe with neighboring regions with export potential, ultimately responding to the need emphasised by REPowerEU to expedite the establishment of hydrogen infrastructure for the production, import and transportation of 20 Mt of hydrogen by 2030.</p>
Pace of Development 	<p>With the Net Zero Industry Act, the European Commission has proposed to strengthen Europe's Net Zero technology products manufacturing ecosystem. The objective of the Act is to facilitate the achievement of at least 40% of annual deployment needs for strategic Net Zero technologies (such as electrolyser and CCS technologies) manufactured in the EU by 2030. The electrolyser value chain has been mapped and an 'Electrolyser Partnership' platform for electrolyser manufacturers and suppliers has been set up to coordinate efforts and avoid bottlenecks in the electrolyser value chain.</p>
Technology 	<p>A new report 'Hydrogen Patents for a Clean Energy Future' by the IEA and European Patents Office shows that the Europe Union and Japan are leading in terms of patent numbers in hydrogen technologies, with the EU filing 28% of all international patent families in hydrogen technologies in 2011-2020. This report highlights positive trends in hydrogen innovation across the hydrogen value chain and industry sectors, with Europe playing a major role in the emergence of new hydrogen technologies. To continue that trend, the European Commission has sustained and increased funds for hydrogen R&D (e.g. REPowerEU called for an increase in the budget Horizon Europe fund to support R&D in clean energy technologies including hydrogen).</p>
Available Clean Electricity* 	<p>In response to the Energy Crisis, the European Commission has accelerated plans and policy frameworks to ramp-up the deployment of clean energy generation indirectly benefitting renewable hydrogen development. The European Commission has set more ambitious renewable energy consumption targets with RED II revision and provided clarity on additionality rules for RFNBOs with the First Delegated Act of RFNBOs.</p>

*The barrier "Available Renewable Electricity" is a critical barrier, however in the scope of the Roadmap it is considered as out of scope. More information can be found with the [Clean Power and Electrification initiative of the World Economic Forum](#).

Current Status of the Enabling Measures (1/2)

Enabling measures have been previously defined as capable of overcoming the barriers to achieve a scaled renewable hydrogen market. The current status of each enabling measure has been assessed in the context of the current EU policy landscape (as of April 2023).



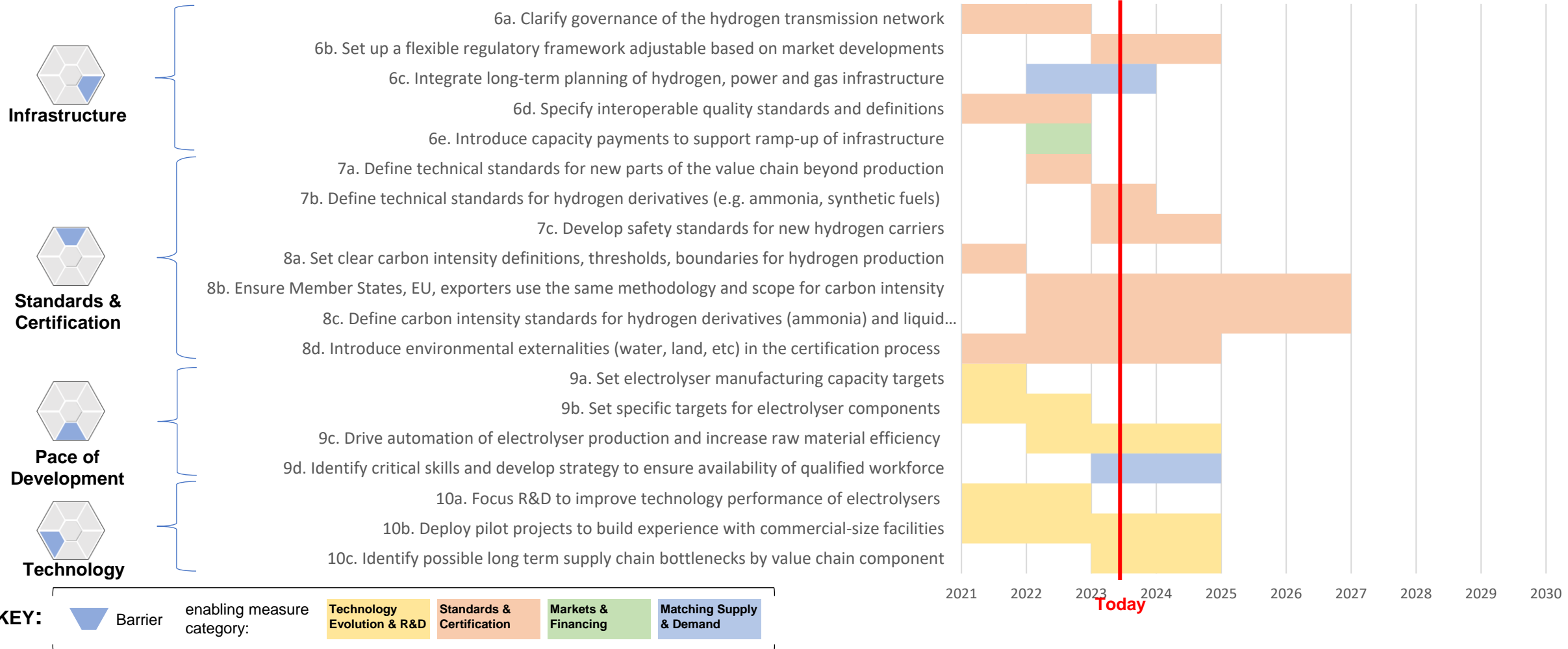
KEY: Barrier

enabling measure category:

- Technology Evolution & R&D
- Standards & Certification
- Markets & Financing
- Matching Supply & Demand

Current Status of the Enabling Measures (2/2)

Enabling measures have been previously defined as capable of overcoming the barriers to achieve a scaled renewable hydrogen market. The current status of each enabling measure has been assessed in the context of the current EU policy landscape (as of April 2023).



Significant progress has been achieved on the Enabling Measures

Upon reviewing the various enabling measures in place, it is evident that Europe has made **substantial progress** towards meeting its 2030 objectives to establish a scaled renewable hydrogen market. The European Commission's efforts in this regard are noteworthy, as it has demonstrated a **strong commitment to promoting the growth of the renewable hydrogen** market and it has made **use of all available instruments** at its disposal to drive progress forward.

To ensure that these efforts translate into achieving the 2030 objectives, it is crucial to **maintain the momentum** on the development of the renewable hydrogen market in Europe. **A number of enabling measures** can be further actioned and accelerated to support the scale-up of the hydrogen market in Europe, including:

1. One-Stop-Shop for Hydrogen Finance

Focus: One-Stop-Shop for Hydrogen Finance

The following enabling measures can be further actioned and accelerated to support the scale-up of the hydrogen market in Europe.

Create one-stop-shop for hydrogen finance			
Description: Initiative to bring together project developers, private finance, development finance and government support under one roof to accelerate project FIDs	Barrier: Cost	Enabling measure: Measure 1	Status: In progress
Key actions of enabling measure (January 2022)	Status	Current status (April 2023)	
Create a forum that connects private finance actors with policy makers to share perspectives on what is stopping FIDs for hydrogen projects.	Green	The European Clean Hydrogen Alliance brings together actors across the clean hydrogen value chain to support large-scale deployment of clean hydrogen technologies by 2030. The Alliance was instrumental for the approval in July and September 2022 of the two Important Projects of Common European Interest (IPCEIs) of renewable hydrogen projects.	Green
Develop a framework and toolkit for the efficient allocation of capital for investors, e.g. cost vs carbon reduction vs System Value of hydrogen above LCOH.	Orange	The European Hydrogen Bank auction scheme is announced for September 2023. It included a framework for efficient allocation of capital for investors.	Orange
Provide technical assistance and grant funding for project development and document preparation.	Green	The European Investment Bank and European Clean Hydrogen Alliance are offering financing and advisory support for renewable hydrogen promoters selected for public funding.	Green
Support project development via provision of project initiation and facilitation tools.	Green	The European Commission developed the European Hydrogen Funding Compass , an online guide for stakeholders to identify European and national public funding sources for hydrogen projects.	Green
Accelerate use of the EU taxonomy for sustainable finance for hydrogen.	Orange	The legal frameworks applicable to hydrogen under the EU Taxonomy and under the Delegated Act for RRFBOs are indirectly linked and make for an enhanced investment environment for hydrogen projects.	Orange

2. Fiscal Incentives for Green Products

Focus: Provide Fiscal Incentives for Green Products

The following enabling measures can be further actioned and accelerated to support the scale-up of the hydrogen market in Europe.

Provide fiscal incentives (tax level differentiation & tax relief) for green goods			
Description: Fiscal incentives refer to lower tax rates or tax relief for consumers who use green products (e.g. green steel, green fertiliser)	Barrier: Cost	Enabling measure: Measure 2	Status: In progress
Key actions of enabling measure (January 2022)	Status	Current status (April 2023)	
Introduce tax differentiation (tax design under which rates on goods are adapted to reflect a government objective, such as climate impact) to reduce profitability for carbon-intensive producers or incentivize the switch to green alternatives.	Orange	One of the key fiscal instruments of the EU to incentivize the switch to green alternatives is by putting a price on carbon emissions with the EU Emissions Trading System (EU ETS) . The EU ETS sets a cap on carbon emissions for certain industries and allows them to trade emissions allowances to meet their targets. By requiring companies to purchase allowances or reduce their emissions, the system creates a financial incentive to reduce carbon emissions and invest in low-carbon technologies. CBAM pilot phase will be launched in September 2023 to apply the same tax for import and to avoid carbon leakage.	Orange
Introduce tax reliefs (schemes where the expense incurred to buy a green product can be partially or fully deducted or from taxes) to encourage consumers to invest in more expensive green goods.	Green	The debate on the EU Energy Taxation Directive , which sets minimum tax rates on energy products and incentivizes the use of renewable energy sources including renewable hydrogen, is still ongoing.	Green

3. Definitions for Hydrogen production



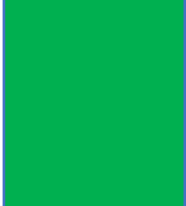




Focus: Carbon Intensity Definitions for Hydrogen Production

The following enabling measures can be further actioned and accelerated to support the scale-up of the hydrogen market in Europe.

Set clear carbon intensity definitions, thresholds, boundaries for hydrogen production			
Description: Ensure that the methodology and criteria for measurement of GHG emissions is standardized, with quantitative thresholds per hydrogen source	Barrier: Standards & Certification	Enabling measure: Measure 3	Status: In progress
Key actions of enabling measure (January 2022)	Status	Current status (April 2023)	
Create design principles to align certification standards and practices, and to facilitate interoperability between them.	Orange	The Delegated Act on Union Methodology for RRFBOs (proposed in February 2022) states that a certification scheme relying on "voluntary schemes" will be introduced to ensure that the producers in third countries adhere to the same criteria. The European Clean Hydrogen Alliance has published a Roadmap on hydrogen standardization including a set of recommendations to streamline and accelerate the process of setting European standards.	Orange
Drive the development of minimum criteria for the definition of green hydrogen sustainability.	Green	Through the Delegated Act on Union Methodology for RRFBOs (proposed in February 2022) the European Commission established a methodology for calculating lifecycle GHG emissions for RRFBOs (the methodology considers GHG emissions across the full lifecycle of fuels, including upstream emissions, emissions associated with taking electricity from the grid, processing, and transporting these fuels to the end consumer). This methodology is not yet in place.	Green
Make a clear distinction between (quantitative) sustainability criteria and (qualitative) labels, thereby ensuring transparency.	Green	The Delegated Act for a minimum threshold for GHG savings of recycled carbon fuels and amines (proposed February 2023) provides a methodology for calculating lifecycle GHG emissions for RRFBOs.	Green


Focus: One-Stop-Shop for Hydrogen Finance

The following enabling measures can be further actioned and accelerated to support the scale-up of the hydrogen market in Europe.

Create one-stop-shop for hydrogen finance		
Description: Initiative to bring together project developers, private finance, development finance and government support under one roof to accelerate project FIDs	Barrier:  Cost	Enabling measure:  Markets & Financing
Key actions of enabling measure (January 2022)	Status	Current status (April 2023)
Create a forum that connects private finance actors with policy makers to share perspectives on what is stopping FIDs for hydrogen projects.		The European Clean Hydrogen Alliance brings together actors across the clean hydrogen value chain to support large-scale deployment of clean hydrogen technologies by 2030. The Alliance was instrumental for the approval in July and September 2022 of the two Important Projects of Common European interest ' (IPCEIs) of renewable hydrogen projects.
Develop a framework and toolkit for the efficient allocation of capital for investors, e.g. cost vs carbon reduction vs System Value of hydrogen above LCOH.		The European Hydrogen Bank auction scheme is announced for September 2023. It included a framework for efficient allocation of capital for investors.
Provide technical assistance and grant funding for project development and document preparation.		The European Investment Bank and European Clean Hydrogen Alliance are offering financing and advisory support for renewable hydrogen promoters selected for public funding.
Support project development via provision of project initiation and facilitation tools.		The European Commission developed the European Hydrogen Funding Compass , an online guide for stakeholders to identify European and national public funding sources for hydrogen projects.
Accelerate use of the EU taxonomy for sustainable finance for hydrogen.		The legal frameworks applicable to hydrogen under the EU Taxonomy and under the Delegated Act for RFNBOs are indirectly linked and make for an enhanced investment environment for hydrogen projects.

Focus: Provide Fiscal Incentives for Green Products






The following enabling measures can be further actioned and accelerated to support the scale-up of the hydrogen market in Europe.

Provide fiscal incentives (tax level differentiation & tax relief) for green goods		
<p>Description: Fiscal incentives refer to lower tax rates or tax relief for consumers who use green products (e.g. green steel, green fertiliser)</p>	<p>Barrier:  Cost</p>	<p>Enabling measure: Markets & Financing</p>
Key actions of enabling measure (January 2022)	Status	Current status (April 2023)
<p>Introduce tax differentiation (tax design under which rates on goods are adapted to reflect a government objective, such as climate impact) to reduce profitability for carbon-intensive producers or incentivize the switch to green alternatives.</p>	On track	<p>One of the key fiscal instruments of the EU to incentivize the switch to green alternatives is by putting a price on carbon emissions with the EU Emissions Trading System (EU-ETS). The EU-ETS sets a cap on carbon emissions for certain industries and allows them to trade emissions allowances to meet their targets. By requiring companies to purchase allowances or reduce their emissions, the system creates a financial incentive to reduce carbon emissions and invest in low-carbon technologies. CBAM pilot phase will be launched in September 2023 to apply the same tax for import and to avoid carbon leakage.</p>
<p>Introduce tax reliefs (schemes where the expense incurred to buy a green product can be partially or totally deducted or from taxes) to encourage consumers to invest in more expensive green goods.</p>	On track	<p>The debate on the EU Energy Taxation Directive, which sets minimum tax rates on energy products and incentivizes the use of renewable energy sources including renewable hydrogen, is still ongoing.</p>

Focus: Carbon Intensity Definitions for Hydrogen Production

The following enabling measures can be further actioned and accelerated to support the scale-up of the hydrogen market in Europe.

Set clear carbon intensity definitions, thresholds, boundaries for hydrogen production

Description: Ensure that the methodology and criteria for measurement of GHG emissions is standardised, with quantitative thresholds per hydrogen source		Barrier:  Standards & Certification	Enabling measure:  Standards & Certification
Key actions of enabling measure (January 2022)	Status	Current status (April 2023)	
Create design principles to align certification standards and practices, and to facilitate interoperability between them.		The Delegated Act on Union Methodology for RNFBOs (proposed in February 2023) states that a certification scheme relying on “voluntary schemes” will be introduced to ensure that the producers in third countries adhere to the same criteria. The European Clean Hydrogen Alliance has published a Roadmap on hydrogen standardization includes a set of recommendations to streamline and accelerate the process of setting European standards.	
Drive the development of minimum criteria for the definition of green hydrogen sustainability.		Through the Delegated Act on Union Methodology for RNFBOs (proposed in February 2023) the European Commission established a methodology for calculating lifecycle GHG emissions for RNFBOs (the methodology considers GHG emissions across the full lifecycle of fuels, including upstream emissions, emissions associated with taking electricity from the grid, processing, and transporting these fuels to the end-consumer). This methodology is not yet in place.	
Make a clear distinction between (quantitative) sustainability criteria and (qualitative) labels, thereby ensuring transparency.		The Delegated Act for a minimum threshold for GHG savings of recycled carbon fuels and annex (proposed February 2023) provides a methodology for calculating lifecycle GHG emissions for RNFBOs.	

Guiding Principles to Accelerate Renewable Hydrogen market development in Europe

Since the enabling measures are closely intertwined with policy and industry needs, the World Economic Forum “[Accelerating Clean Hydrogen](#)” initiative aims to facilitate dialogue and collaborative activities among policy makers, industry and other key stakeholders to accelerate priority enabling measures.



Strive to ensure **legislation is future-proof and flexible** by regularly reviewing and revising laws to **account for technological advancements and changes in the market** (as done with REPowerEU and CBAM).



Continue to **develop global standards in order to facilitate a level playing field for businesses** operating in different countries, and to facilitate international trade.



Aim to provide **investors with legal certainty** by establishing clear **guidelines that are both predictable and consistent** over time.



Promote development of **practical tools which empower industry players** to navigate the diverse funding and regulatory environment (as done with the Hydrogen Funding Compass).



Explore the **use of regulatory “sandboxes” to allow for innovative solutions to be tested** in a controlled environment before being deployed to the market.



Foster **collaboration and knowledge-sharing** between regulators, industry stakeholders and academics **to identify and remove regulatory and non-regulatory barriers** which hinder innovation and growth.

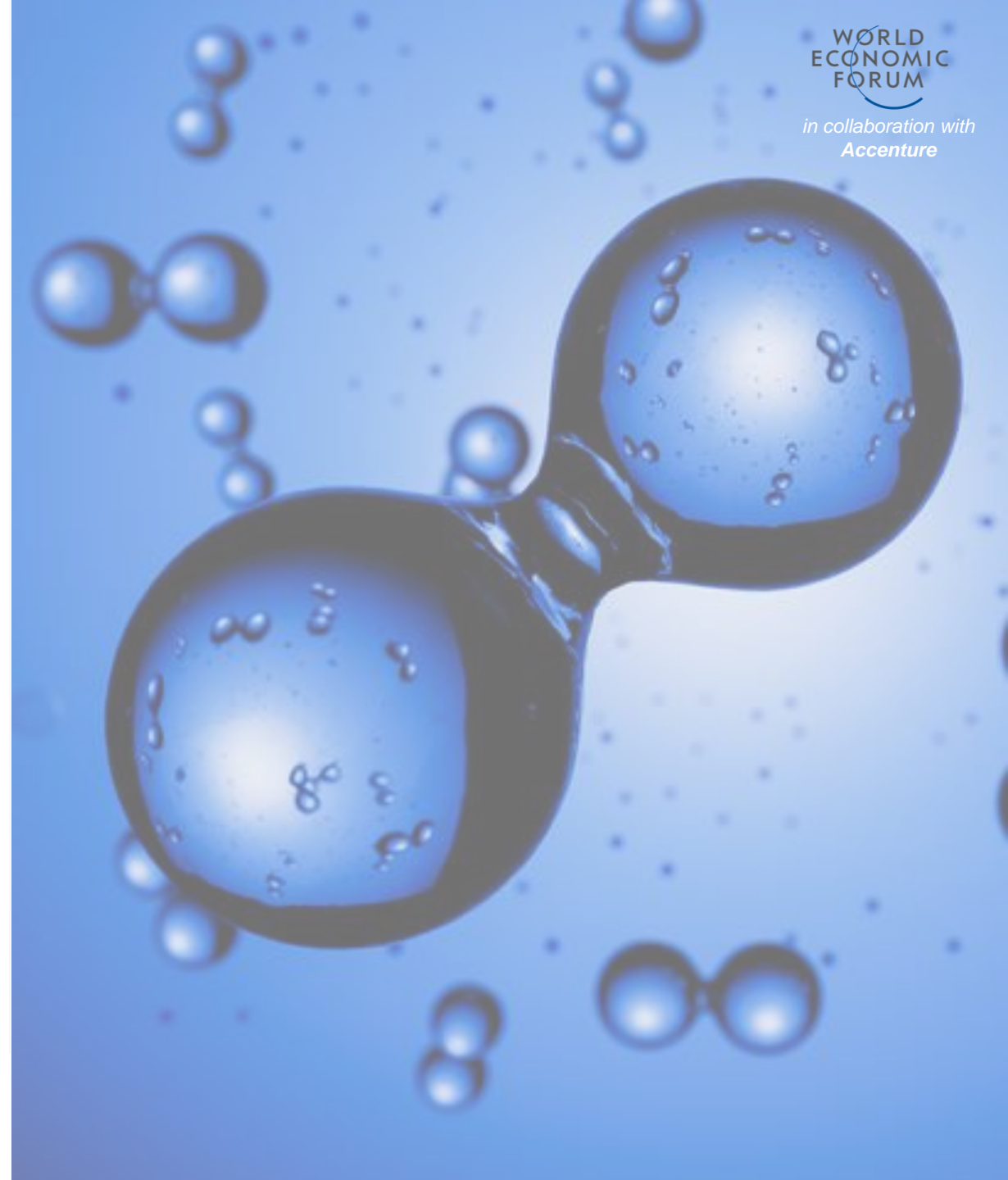
Table of Contents

1 [Accelerating Clean Hydrogen Initiative](#)

2 [Key Policy and Funding Updates](#)

3 [Roadmap Progress Update](#)

4 [Reference Library: Key Policy and Funding Updates](#)



REPowerEU Plan – Key Hydrogen Measures



REPowerEU complements the preceding EU Hydrogen Strategy, and aims to produce 10 Mt of domestic renewable hydrogen as well as to add another 10 Mt of imported renewable hydrogen by 2030.

Sector Sub-targets

Sectorial sub-targets for renewable fuels of non-biological origin (RFNBOs) have been set within industry and transport under the RED ([see Ref. slide](#)), in alignment with the REPowerEU ambition (42% for industry and 5% for transport).

Double Hydrogen Valleys

REPowerEU has called for an increase in the budget of the Horizon Europe fund, with the understanding that the Hydrogen Valleys will receive a significant portion of their funding and to make sure to reach the goal of doubling the number of Hydrogen Valleys across Europe.

Joint Purchasing Mechanisms

Joint Purchasing Mechanisms will facilitate the establishment of a dedicated workstream on joint renewable hydrogen purchasing under the EU Energy Platform, which will provide for the voluntary joint purchase of gas, LNG and hydrogen.

Trans-European Networks for Energy & import corridors

Trans-European Network for Energy (TEN-E) policy intends to link the energy infrastructures of EU countries, inc. hydrogen infrastructures. By end of 2023, Commission plans to identify cross-border hydrogen projects with a status of 'projects of common interest' that will benefit from EU funding. Import infrastructure: by 2030, Commission intends to develop three hydrogen import corridors via the Mediterranean, the North Sea area, and Ukraine (when feasible)

European Hydrogen Bank

To support hydrogen uptake and electrification in industry, the European Commission will roll out auction schemes and dedicated innovation funding to support a full switch of existing hydrogen production from natural gas to renewables, and to facilitate the transition to hydrogen-based production processes in industrial sectors such as steel production.

Innovation/R&D

A specific REPowerEU Innovation funding window will support (1) innovative electrification and hydrogen applications in industry, (2) innovative clean tech manufacturing (such as electrolyzers and fuel cells, innovative renewable equipment, energy storage or heat pumps for industrial uses), and (3) pilots for validating, testing and optimising highly innovative solutions.

Hydrogen Accelerator SWD*

- 1) Raises target up to 10 Mt of renewable hydrogen for production and up to 10 Mt for import by 2030.
- 2) Proposes simplified permitting, strategic projects (TEN-E), and new standards to support scale-up of technologies.

* SWD: Staff Working Document is a nonbinding document that frame the implementation of the policy framework

Green Deal Industrial Plan for the Net-Zero Age



The Green Deal Industrial Plan forms part of the European Green Deal, which set Europe on the path to climate neutrality and will enable Europe to lead the way globally in the Net Zero industrial age. The Plan supports scaling up of the EU's manufacturing capacity for Net Zero technologies such as renewable hydrogen via the four pillars outlined below:

Simplified regulatory environment



The first pillar is about facilitating a simpler regulatory framework to ensure industrial competitiveness and avoid unnecessary burdens. The European Commission will come with three key proposals:

1. **The Net Zero Industry Act:** to promote simplified permitting, strategic projects, and standards to support scale-up of technologies.
2. **The Critical Raw Materials Act:** to ensure access to raw materials vital to manufacturing of key technologies.
3. **Reform of the electricity and gas market design:** to support consumers in benefiting from lower costs of renewables.

Faster access to funding



The second pillar aims to accelerate investment and financing for clean tech production in Europe by unlocking public and private financing, through:

- **Guaranteeing** a level playing field while making it easier for Member States to grant aid by consulting with other EU countries on amending the **Temporary State Aid crisis and Transition Framework**.
- Facilitating the use of existing EU funds for financing clean tech innovation, manufacturing, and deployment. In the short term **REPowerEU**, **InvestEU** and the **Innovation Fund** are the focus. **In the mid-term, the European Commission wants to propose a European Sovereignty Fund by Summer 2023.**
- **Releasing new guidance** on recovery and resilience plans to aid Member State's access to REPowerEU funds.

Enhancing availability of green skills



The third pillar prioritizes developing the skills needed for well-paid quality jobs in light of the green transition affecting 35% to 40% of all jobs. The following is proposed:

- **Establishing Net Zero Industry Academies** to roll out up-skilling and re-skilling programmes in strategic industries.
- Exploring a **'Skills-first' approach** to recognise **(existing)** skills
- Facilitating access for third-country nationals to EU labour markets in priority sectors.
- Adopting measures to **foster and align public and private funding** for skills development.

Open trade for resilient supply chains



The fourth pillar focuses on global cooperation for resilient supply chains, promoting open trade and fair competition by:

- **Continuing** to develop a **network of Free Trade Agreements** to support the green transition.
- Exploring the creation of a **Critical Raw Materials Club** to ensure a competitive and diversified industrial base.
- **Considering the concept of Clean Tech/Net Zero Industrial Partnerships.**
- **Protecting the Single Market from unfair trade** in the clean tech sector and using instruments to prevent distortion by foreign subsidies.

Source: [European Commission](#); Press release 1 Feb 2023

Emission Trading System Revision



The EU Emission Trading System (ETS) is a key tool for cost effectively reducing GHG emissions for goods produced within the EU-ETS Zone. the European Commission has proposed a more ambitious ETS up to 2030.

Proposed revisions for ETS phase 4 (2021-2030):



Emission reduction Target

Increase the emissions reduction factor covered under EU-ETS to **62%** by 2030, which will have an impact in decreasing the emission limit (cap).



Lengthening the Market Stability

Reserve mechanism with an annual intake rate of **24% of allowances** to address possible imbalances between supply and demand.



Free allowance phase-out revision

Reduction at slow rate until 2029 and at an accelerated rate from 2030 **until 2034**, which will comprise the total phase-out of free allowances.



Maritime transport extension

Extension of ETS to include maritime transport from **2024** with a gradual phase-in until 2026. Different timings apply for offshore vessels of over 5000GT and general cargo vessels.



Separate ETS for building and Transport

Creation of a separate ETS (**ETS II**) specifically for buildings and road transport as of **2027**, which is one year later than previously proposed.



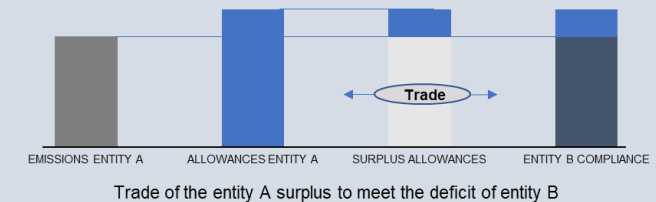
ETS revenue use revision

Adoption of new rules on use of ETS revenues for the **Innovation Fund** and the **Modernisation Fund** could also finance cross-border projects in low-growth border regions.

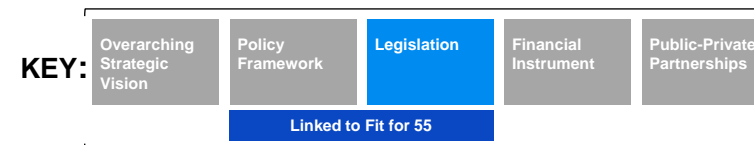
Implication for the renewable hydrogen market: The revisions of the ETS phase 4 impact the renewable hydrogen market directly, as hydrogen production with electrolyzers falls within the scope of the EU-ETS. Additionally, the EU-ETS revisions indirectly affect renewable hydrogen demand as other industries are incentivised to decarbonise due to rising carbon costs.

What is the EU-ETS?

- The EU Emissions Trading System (EU-ETS) was created in 2005 and was the world's first major carbon market.
- EU-ETS is a cap-and-trade system for GHG emissions allowances that can be traded between entities:
 - The emission limit (cap) and free allowances decreases each year.
 - Trade occurs at the EU carbon price, which is determined by supply and demand of allowances.
- Selected sectors accounting for 40% of EU GHG emissions: electricity and heat generation, energy-intensive industry sectors and aviation within the EU economic area.
- Some technologies (including electrolyzers) are given free allowances to remain competitive.



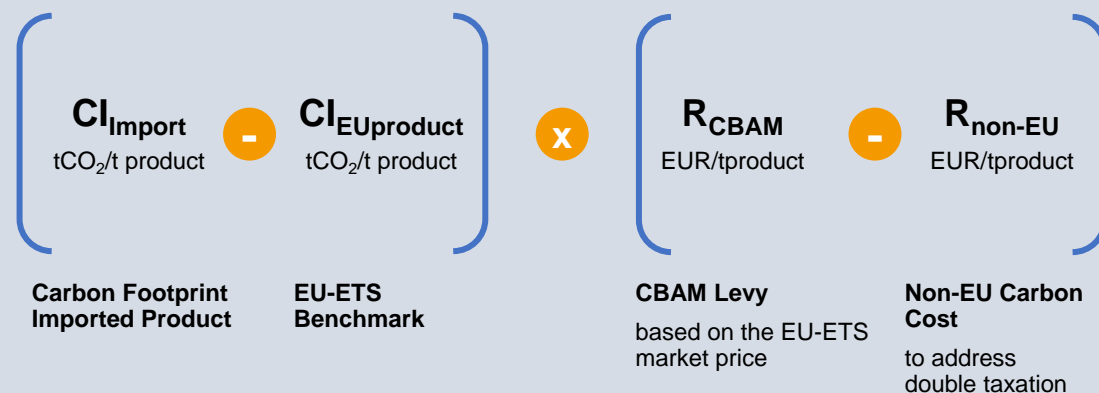
Carbon Border Adjustment Mechanism



The Carbon Border Adjustment Mechanism (CBAM) aims to prevent carbon leakage and is applicable on goods imported into the EU-ETS Zone.

What is the EU CBAM?

- “Carbon Leakage” is the relocation of production capacity to low- or no-carbon pricing areas.
- Selected sectors covered in the first phase include cement, aluminum, iron and steel, fertiliser, electricity production and hydrogen.
- The CBAM targets carbon leakage by attaching an import levy in line with the EU-ETS emissions allowance price.
- The proposed method to calculate the CBAM levy is as below:



The European Commission proposed the below timeline to phase in CBAM:



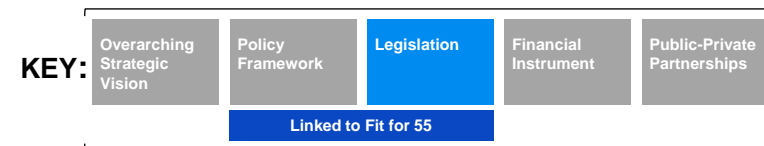
Under the provisional agreement, a **simplified CBAM** would oblige importers to collect and report carbon data (i.e. the direct emissions generated during a product’s production process).

During a 9-year **gradual phase-in period**, importers would be obliged to submit CBAM certificates and pay the levy. The European Commission will then evaluate whether to extend its scope to include other sectors and whether to account for indirect emissions (i.e. Scope 2,3).

CBAM to follow the phase out rate of EU-ETS free allocation*
(*see previous slide on ETS revision information).

Source: [European Parliament Press release](#)

Common Rules for Future Gas & Hydrogen Market



In aiming to facilitate the gas sector's transition towards renewable and low-carbon gases (especially hydrogen and biomethane), on March 28th 2023 the Council of the EU defined its negotiating position on two proposals – one regulation and one directive – which seek to create a regulatory framework for dedicated hydrogen infrastructure, markets and integrated network planning across the EU. Now the Council has confirmed these proposals (which comprise part of the 'Fit for 55' package), the Parliament can begin negotiations which, once complete, will allow the institutions to adopt and implement these changes.

Create conditions for the transitioning EU gas market which protect consumers whilst promoting competitiveness and ultimately advance progress towards Net Zero

The Council's proposed Directive seeks to extend the legislative principles that govern EU gas networks to include hydrogen networks through:



Establishing definitions for 'low-carbon' and creating provisions on sustainability / certification of renewable and low-carbon gases.



Setting consumer protection rules enabling consumers to easily switch suppliers and prioritise renewable / low-carbon gases over fossil fuels.



Establishing provisions relating to TSOs and DSOs (incl. unbundling), third-party access to gas infrastructure and integrated network planning, and independent regulatory authorities.



Not extending contracts for unabated fossil natural gas beyond 2049 to avoid fossil fuel 'lock in' and make space for clean gases in market.

The Council's proposed Regulation aims to facilitate uptake of renewable and low-carbon gases (especially hydrogen and biomethane) into the EU gas market by:



Requiring existing gas infrastructure to integrate hydrogen/renewable gases by removing interconnection tariffs and lowering tariffs at injection points.



Creating rules and provisions for cross-border hydrogen networks to facilitate blending of hydrogen with natural/renewable gases, in order to facilitate regional cooperation on gas quality and fight against cyberattacks on EU energy networks.



Requiring states to include storage in security of supply risks assessments and facilitate voluntary joint procurement of strategic stocks.



Creating a European Network of Network Operators for Hydrogen to promote dedicated hydrogen infrastructure, cross-border coordination and interconnector network construction, and elaborate on specific technical rules.

Renewable Energy Directive Revisions



The Renewable Energy Directive promotes the use of Renewable Fuels of Non-Biological Origin (RFNBOs) by setting concrete targets to use RFNBOs to decarbonize industry and transport. In late March 2023, European Council and Parliament negotiators reached a provisional political agreement to increase the share of renewable energy usage across the economy and to revise sector-specific targets.

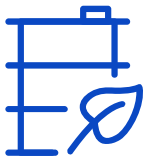
Revised targets for 2030:



42.5%

Renewables in the EU's final energy consumption with an additional 2.5% indicative top-up that would enable a rate of 45%.

Revised sector-specific sub-targets for 2030:



400GW

Renewable hydrogen electrolyser capacity in the EU.



42%

Of hydrogen used in industry should be replaced with Renewable Fuels of Non-Biological Origin (RFNBOs) consumption (target of 60% by 2035).



5.5%

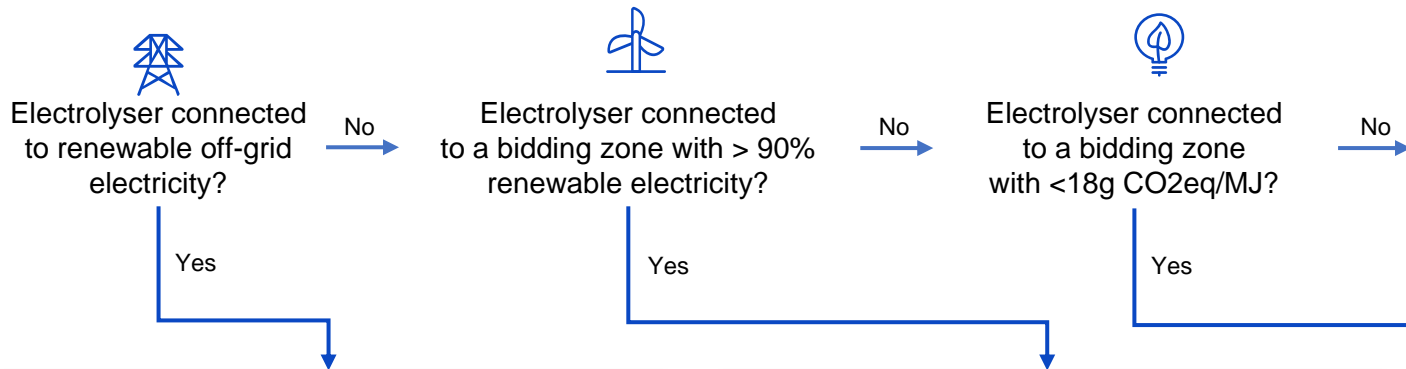
Renewable Fuels of Non-Biological Origin (RFNBOs) use in transport sector.

First Delegated Act on Union Methodology for RFNBOs



This Delegated Act defines under which conditions hydrogen, hydrogen-based fuels or other energy carriers can be considered to be Renewable Fuels of Non-Biological Origin (RFNBOs).

Depending on the electricity source connected to the electrolyser used to produce the Fuel of Non-Biological Origin (RFNBOs) there are different conditions applicable to be considered an RFNBO:



Scenario 1, Direct connection between RE plant and RFNBO generator:

A RE plant which is located in the same installation as an electrolyser or is connected to it via a direct line. If the RE plant also has a grid connection, the operator will need to prove via smart meters that no electricity from the grid was used for the production of the RFNBO's.

Scenario 2, Bidding zone with > 90% renewables:

In this scenario, all electricity can be considered to be fully renewable and thus no PPA is needed to prove the connection to renewable energy (Norway being the main beneficiary).

Scenario 3, Electricity from renewable PPA:

Producer needs to conclude a renewable power purchase agreement (PPA) to ensure the supply of renewable electricity and to prove that the RFNBO production is conducted when the power-generating installation is using RE sources. In addition, the producer must follow:

- Geographical correlation: Producer and electrolyser shall be located in the same bidding zone.
- Temporal correlation: A guarantee of origin (GO) released on a monthly basis (from 2030 an hourly GO) proves the correlation of available renewable energy and the production of renewable hydrogen.
- Additionality rules: RE plant(s) installed no more than 36 months before the electrolyser; RE plant must not have received operating or investment aid (to support first movers, does not apply until 2038 for producers setting up before January 2028).

Scenario 4, Electricity from renewable PPA (exemption):

There is an exemption from additionality rules (36-month rule and investment aid) for the producer located in a bidding zone where the emission intensity of electricity is lower than 18g CO2eq/MJ (relevant for France & Sweden). The producer will still require a PPA and must follow a geographical and temporal correlation.

Source: [European Commission](#)

Delegated Act for a Minimum Threshold for GHG Emission Savings of Recycled Carbon Fuels and Annex



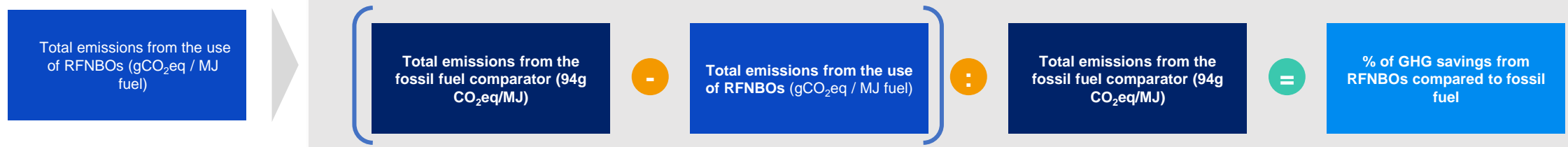
This Delegated Act establishes the methodology by which to calculate GHG emissions savings from RFNBOs and recycled carbon fuels.

Calculation methodology of Green House Gas emissions for RFNBOs:

Emission are express by dividing the total emissions of the process covering each element of the formula by the total amount of fuel stemming from the process and shall be expressed in terms of grams of CO₂ equivalent per MJ of fuel (g CO₂eq/MJ fuel).



Calculation methodology of Green House Gas emission savings for RFNBOs compared to fossil fuel:



% of GHG savings from RFNBOs compared to fossil fuel

RED II states: RFNBOs need to deliver Green House Gas emission savings of **minimum 70%** compared to fossil fuels, which is equivalent to minimum **3.38kg CO₂ per kg of hydrogen**.

Source: [European Commission](#)

European Net Zero Industry Act



The Act is a legal framework of measures focused on strengthening Europe’s Net Zero technology products manufacturing ecosystem. The objective of the Act is to facilitate the achievement of at least 40% of annual deployment needs for strategic Net Zero technologies manufactured (such as electrolyser and CCS technologies) in the EU by 2030.

- Focus on **8 strategic Net Zero technologies**:
1. Solar photovoltaic and solar thermal technologies
 2. Onshore wind and offshore renewables
 3. Batteries and storage
 4. Heat pumps and geothermal energy
 5. Electrolysers and fuel cells
 6. Sustainable biogas/biomethane
 7. Carbon capture and storage (CCS)
 8. Grid technologies

The Net Zero Industry Act legal framework is built on 6 pillars:

Enabling conditions for net-zero technology manufacturing

Simplifying permit-granting processes and giving priority to **Net Zero Strategic Projects** for the **8 Strategic Net Zero technologies**.

CCSCO₂ injection capacity

Establishing the EU objective of reaching 50 Mt of annual CO₂ storage capacity by 2030 and introducing requirements for the oil and gas producers to contribute to this goal.

Access to markets

Boosting diversification for Net Zero technologies by introducing sustainability and resilience criteria in public procurement and auction processes, as well as actions to support private demand.

Skills for quality job creation in net-zero technologies

Establishing specialised European skills Academies to reskill and upskill workers required for net-zero technology industries.

Innovation

Setting up regulatory sandboxes to test innovative Net Zero technologies in a controlled way for a limited time period.

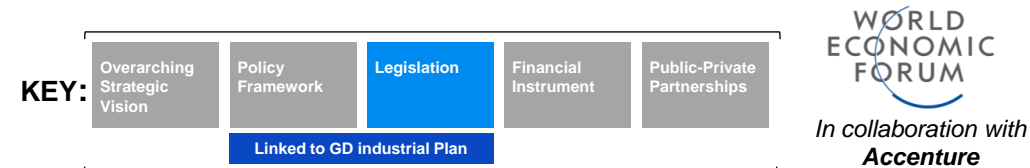
Net-Zero Europe Platform

Allowing the European Commission to coordinate the above actions jointly with Member States.

Implication for the renewable hydrogen market: the Act supports the scalability of the renewable hydrogen supply chain by increasing and simplifying access to public funds for Net Zero technologies critical to renewable hydrogen production such as renewable energy technology, electrolysers. The expected accelerated growth of these strategic technologies in turn reduces the risk for European producers of lacking the materials required to produce renewable hydrogen.

Source: [European Commission](#)

Critical Raw Material Act



While demand for critical raw materials is projected to increase drastically, Europe heavily relies on imports. The EU needs to mitigate supply chain risks relating to such strategic dependencies in order to enhance the bloc’s economic resilience.

Focus on 34 critical raw materials and 16 strategic raw materials (Full list in [Annex II](#)):

- Aluminum
- Boron
- Cobalt
- Copper
- Helium
- Heavy Rare Earth Elements
- Light Rare Earth Elements
- Lithium
- Magnesium metal
- Natural Graphite
- Nickel
- Rare Earth Elements for magnets
- Silicon metal
- Scandium
- ...

Internal and international actions are defined:



Setting clear priorities for action

Setting up For 2030, no more than 65% of the Union's annual consumption of SRM must come from a single third country.



Creating secure and resilient EU critical raw materials supply chains

Selecting strategic projects to explore geological resources will benefit from support for access to finance and shorter permitting timeframes.



Ensuring that the EU can mitigate supply risks

Performing an audit for Certain large companies of their strategic raw materials supply chains, comprising a company-level stress test.



Investing in research, innovation and skills

Establishing a large-scale skills partnership on critical raw materials and the future Raw Materials Academy will promote skills relevant to the workforce.



Improving circularity and sustainability of CRM

Improving the collection of critical raw materials and ensure its recycling into secondary critical raw materials.



International engagement

Strengthening EU global engagement with reliable partners to develop and diversify investment and promote stability in international trade.

Implication for the renewable hydrogen market: The Act **limits the risk of bottlenecks** in the supply of key raw materials (such as scandium) for electrolyser manufacturing by enabling resilience in diversifying the countries of import and possibly having a domestic (EU) raw materials market.

Source: [European Commission](#) ; [European Commission: RMIS - Raw Materials Information System](#)

European Hydrogen Bank



The European Hydrogen Bank aims to support and accelerate investment in order to facilitate progress towards the REPowerEU targets. A competitive bidding mechanism complementary to the existing grant programmes is proposed.

The Four Pillars of the European Hydrogen bank:



Boosting EU hydrogen production:

Covering and lowering the cost gap between renewable hydrogen and fossil fuels by proposing an auction system for renewable hydrogen producers under the EU Innovation Fund, effectively providing a premium offtake price.



Facilitating Imports to the EU:

Supporting EU Partner Countries in their green transition efforts and exploring the possibility to offer a green premium for renewable hydrogen imports via a similar auction system as used for the domestic EU market.



Ensuring transparency and coordination:

Increasing transparency of transactions by developing price benchmarks, supporting infrastructure planning and providing transparency on infrastructure needs.



Streamlining existing financial instruments:

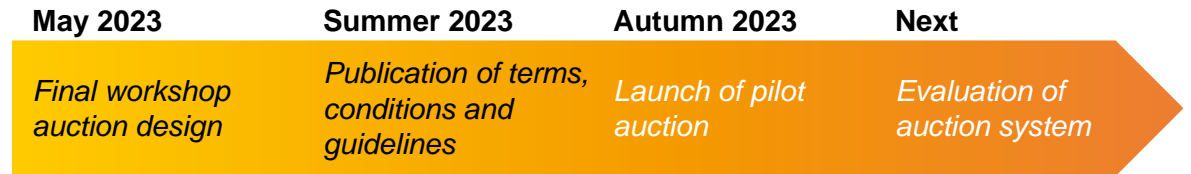
Streamlining access to EU funding programmes such as the European Regional Development Fund (ERDF), the Just Transition Fund and the InvestEU Fund.



Details on the Auction system for renewable hydrogen producers.

Objective: De-risk the renewable hydrogen market by lowering the cost gap between renewable hydrogen and the fossil fuels it can replace.

Timeline:



Proposed auction system March 2023 (confirmed in summer 2023):

- Supply-side static auction: fixed premium bids (fixed price payment per kg of hydrogen produced) for a maximum of 10 years of operation
- Indicative budget for first auction: €800 million from the Innovation Fund

Source: [Communication on European Hydrogen Bank](#) ;

Alphabetical List of Acronyms

Acronym	Description
CBAM	Cross Border Adjustment Mechanism
CCS	Carbon Capture and Storage
CSRD	Corporate Sustainability Reporting
CRM	Critical Raw Materials
ERDF	European Regional Development Fund
EU	European Union
EU-ETS	European Union Emissions Trading System
FID	Final Investment Decision
GHG	Greenhouse Gas Emissions
GO	Guarantee of Origin
IPCEI	Important Projects of Common European Interest
LCOH	Levelised Cost of Hydrogen
LNG	Liquefied Natural Gas
NZI	Net Zero Industry

Acronym	Description
PPA	Power Purchase Agreement
R&D	Research and Development
RED	Renewable Energy Directive
RFNBO	Renewable Fuels of Non-biological Origin
RE	Renewable Energy
SRM	Strategic Raw Materials
TBD	To Be Defined

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- Noam Boussidan from the World Economic Forum
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