Clean Hydrogen Partnership

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Project development assistance for regions (PDA II)

Title EU Policy Support for Hydrogen

Date 14.06.2023

Authors: Hannah Bryson-Jones (Hannah.Bryson-Jones@deltah.co.uk)

Yvan Bollet (yvan.bollet@deltah.co.uk)

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Introduction

EU Hydrogen Policy Developments

National Implementation Example

Project Subsidies

Conclusions

Introduction

Ambitions for hydrogen in Europe

Europe is set to become a major renewable hydrogen producer and importer in the next few decades. The EU Hydrogen Strategy sets out four key areas to develop hydrogen in Europe.

Strategy focus area	High Level Summary
Investment agenda for the EU	❖ Create a pipeline of hydrogen projects ready for investment ❖ Encourage member states to invest in key projects
Boosting demand and scale of projects	❖ Build a common definition of green hydrogen for Europe ❖ Create EU policies to develop hydrogen demand
Create a supportive framework for hydrogen	❖ Build up hydrogen infrastructure such as refuelling stations ❖ Fund demonstrator projects and new hydrogen technologies
International cooperation	❖ Develop partnerships with neighbouring regions for hydrogen imports ❖ Develop a framework to ensure imported hydrogen meets green requirements

By 2025

6GW of renewable hydrogen electrolysers in Europe

1 million tonnes of European renewable hydrogen production

By 2030

40GW of renewable hydrogen electrolysers in Europe

10 million tonnes of European renewable hydrogen production

Introduction

Role of policy in developing green hydrogen

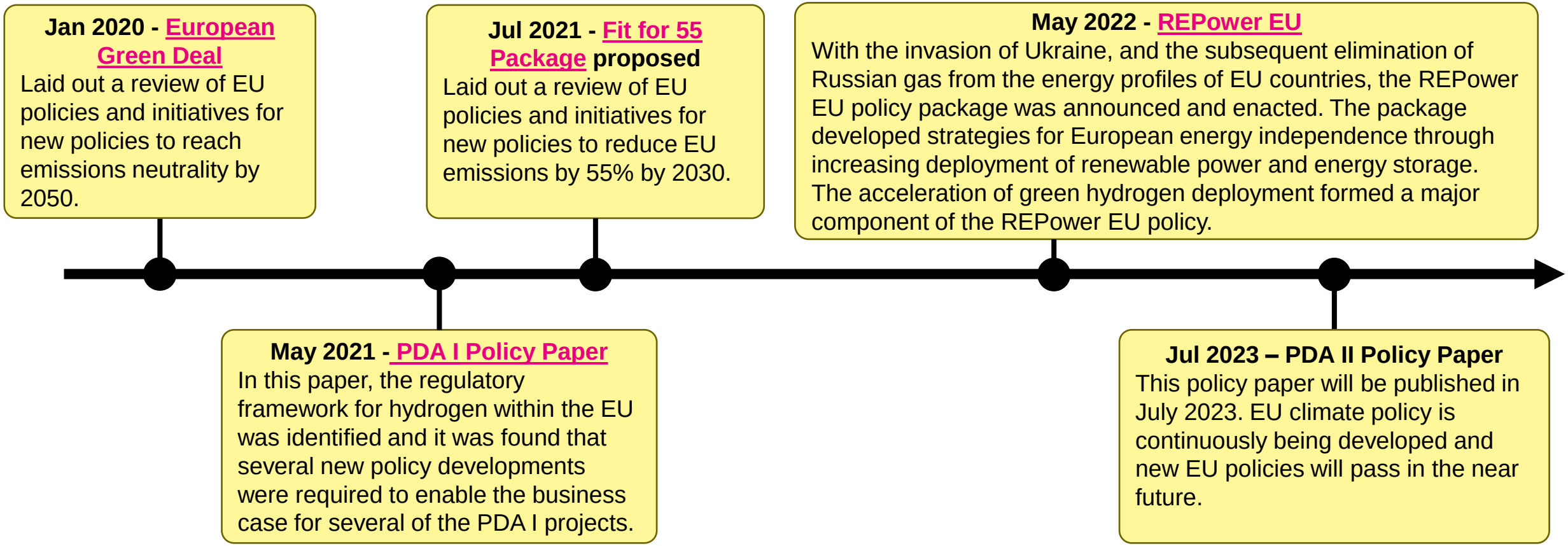
The initial phases of hydrogen deployment face many challenges. Legislation is presented as a tool to help overcome these challenges and accelerate the realisation of Europe's hydrogen targets.

Challenges	Proposed Solutions
Green hydrogen is currently more expensive than hydrogen produced from fossil fuels (grey and black hydrogen) or alternative fossil-based technologies, due to the relative technical immaturity of the technology and current small scales of deployment.	❖ Capital grant support for the development and early-stage scaling of new, more efficient technologies for green hydrogen production. ❖ Develop policy to financially support large-scale green hydrogen production so that technologies can take advantage of economies of scale.
The financial risks of investment in hydrogen technologies and projects are currently too great for many investors due to high costs and uncertainties in the business case.	❖ Clear policy support for the adoption of hydrogen technologies. ❖ Public grant funding of hydrogen projects. ❖ Low-cost financing for hydrogen projects.
Carbon-intensive technologies currently offer a lower risk and cheaper alternative to green hydrogen. Carbon-intensive technologies are demonstrated to work at scale and the supporting infrastructure for these technologies already exists (e.g. oil refineries).	❖ Making carbon-intensive technologies more expensive to use through policy. ❖ Mandatory reductions in the use of carbon-intensive technologies. ❖ Build up green hydrogen infrastructure.

Introduction

Policy importance for the PDA programme

Direct and indirect regulations surrounding hydrogen production and its downstream applications can enable the business case for the deployment of hydrogen projects. The aim of the Project Development Assistance Programme is to develop projects which will contribute towards national and EU climate targets and the goals of the EU Hydrogen Strategy. The PDA program was launched as an initiative of the Clean Hydrogen Joint Undertaking.
To deliver on these, an understanding of EU regulations is required. The timeline below outlines some of the major EU policy packages relating to renewable energy and hydrogen, and PDA policy paper publications.



- Introduction
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EU Policy Development

How policy can support green hydrogen

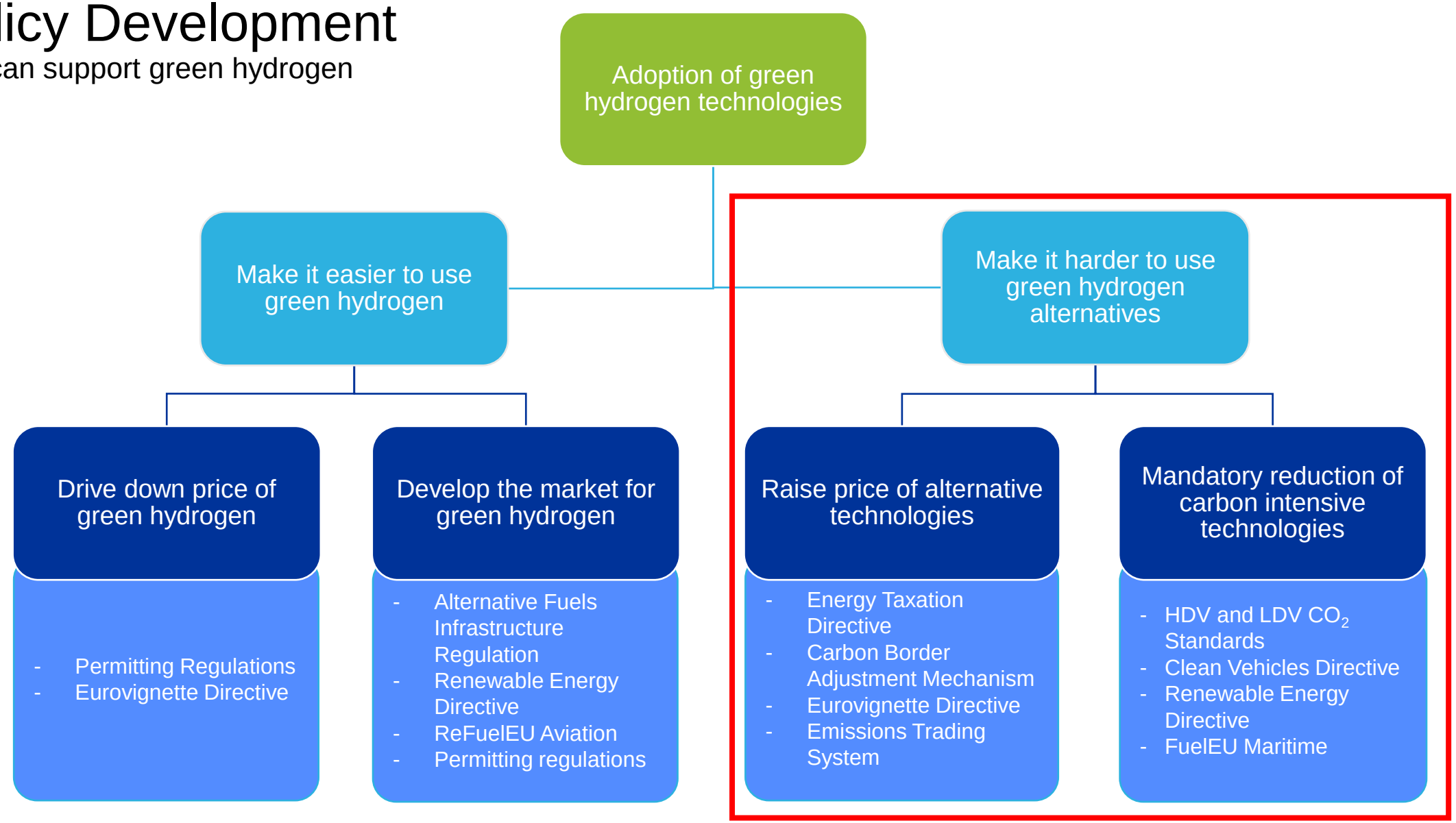
How does EU policy support green hydrogen technologies?

Driving the business case for green hydrogen technologies can be achieved by either making it easier to use green hydrogen technologies or harder to use carbon intensive technologies.

EU policies reflect these two paths through price control policies to favour green hydrogen technologies and market regulation policies which encourage the growth of hydrogen compatible technologies and mandatory reductions in carbon intensive technologies.

EU Policy Development

How policy can support green hydrogen



EU Policy Developments since 2021

Energy Taxation Directive

Raise price of alternative technologies

The Energy Taxation Directive (ETD) sets minimum exercise duty rates for energy products used as motor fuels and fuels used for heating and electricity within the EU. The current ETD framework is outdated as it does not make clear provisions for renewable fuels such as green hydrogen or electricity from renewable energy sources. In addition, minimum tax rates set out in the ETD do not reflect the environmental impact of the fuels or their energy density. For example, biofuels and advanced biofuels (with lower envornmental impacts than conventional biofuels) are taxed at the same rate.

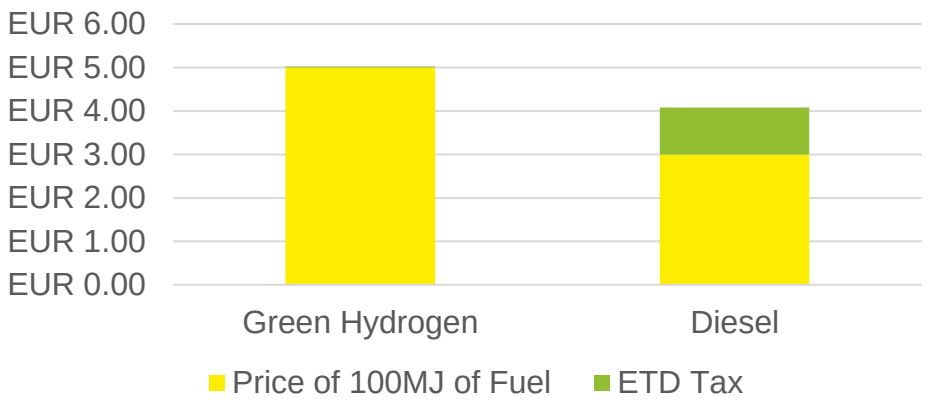
In July 2021 the European Commission generated a proposal which suggested updates to the ETD to reflect the EU's accelerated energy targets. No agreement has been reached for the ETD update, but the proposal includes:

- Tax rate for fuels to reflect the energy content of the fuel and its environmental impact instead of based on volumes (EUR/MJ instead of EUR/litre).
- Extends the ETD to fuels used within the aviation and maritime industries for intra-EU travel (see FuelEU maritime and ReFuelEU aviation sections).
- A recognition of green hydrogen as an energy carrier was made with hydrogen proposed to take advantage of an initial zero-tax rate which would see it become more cost-competitive as a fuel.

For PDA projects, the ETD update would help to enable the business case for hydrogen powered transportation. Hydrogen fuels will become more cost-competitive over time through near-exemption to energy taxation due to the limited or zero emissions in their production and use.

Updated Tax Rates under ETD European Commission Proposal

Fuel Type	Tax Rate (EUR/GJ)
Conventional Fossil Fuels	10.75
Natural Gas (transport)	7.17
Natural Gas (Heating)	0.6
Green Hydrogen and Advanced Sustainable Biofuels	0.15



EU Policy Developments since 2021

Emissions Trading System

Raise price of alternative technologies

The Emissions Trading System (ETS) is a cap-and-trade system for limiting CO_2 and other polluting emissions produced within the EU. A fixed number of emissions credits are available each year for purchase. Companies operating in industries covered by the ETS must buy and surrender emissions credits equivalent to their total emissions that year.

The price of emissions credits has increased dramatically since 2020 reaching a high of over EUR100 in March 2023.

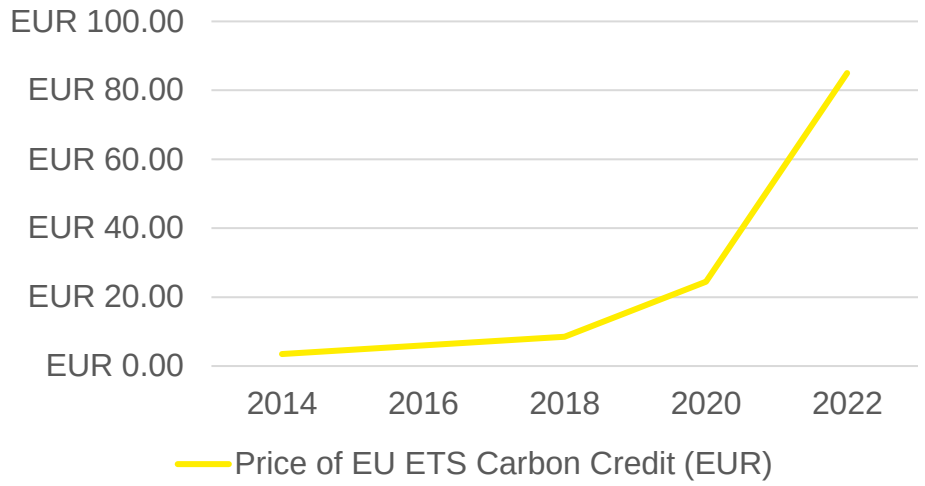
Industries currently covered by ETS

- electricity and heat generation
- commercial aviation
- energy intensive industries such as steel and cement production

ETS II

A separate ETS system referred to as ETS II, which will apply to fuels used in buildings, road transports and other small sector industries, is due to come into effect in 2027/2028. ETS II will operate with the same cap-and-trade mechanism as the original ETS. Money raised through ETS II will be used to fund a new Social Climate Fund which will be formed in 2026. Details on which projects will be supported by the Social Climate Fund are not yet known, but the fund is designed to address the social impact of the inclusion of building and road transport fuels in ETS II.

EU ETS carbon credit price trend in the last decade



EU Policy Developments since 2021

Carbon Border Adjustment Mechanism

Raise price of alternative technologies

The Carbon Border Adjustment Mechanism (CBAM) acts similarly to a carbon tax on goods imported into the EU. Suppliers of certain goods will need to buy and surrender emissions credits equivalent to the emissions released in producing goods imported into the EU. Fines will apply where emissions are not matched with CBAM certificates. A fixed number of emission certificates will be issued each year, which will cap the emissions imported into the EU. A transitional phase of CBAM is being implemented in October 2023 with the full implementation taking place in 2026.

The purpose of CBAM can be understood as the following:

- Prevent European countries from “exporting” their emissions by having carbon intensive goods produced overseas
- Prevent European goods produced with more expensive low-carbon techniques from being undercut by cheaper carbon-intensive goods from outside the EU
- Encourage low-carbon standards in goods produced beyond the EU borders

For PDA projects, CBAM will need to be considered if looking to import hydrogen or other products from outside of the EU

EU Policy Developments since 2021

FuelEU Maritime and ReFuelEU Aviation

Mandatory reduction of carbon intensive technologies

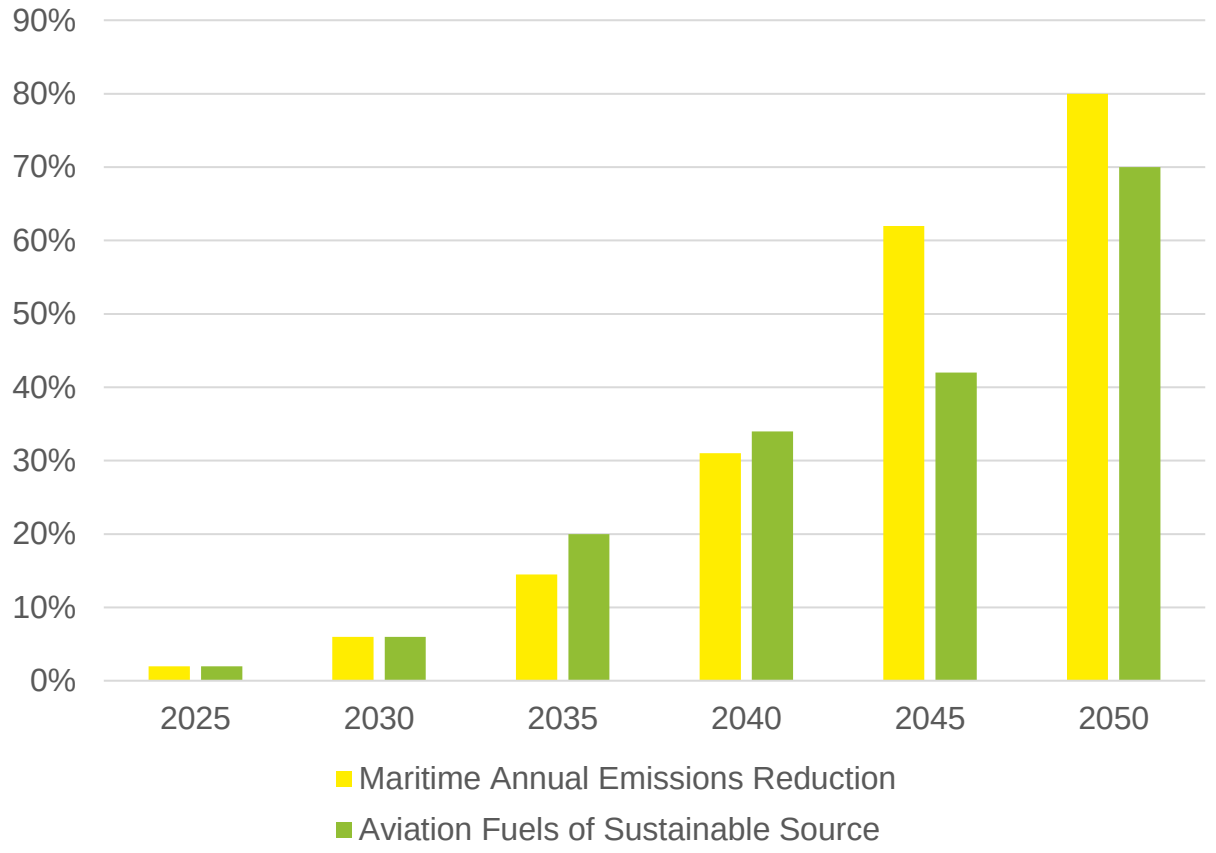
The European Commission's Fit for 55 policy package extended mandatory requirements for low-carbon fuel use to the aviation and maritime sectors for the first time. These sectors represented over a quarter of European emissions from the transport sector in 2018.

FuelEU Maritime main points:

- Applies to vessels weighing over 5,000 tonnes
- Scaled reductions in the greenhouse gas emissions of vessels travelling between EU ports
- For ships travelling to or from a non-EU port, half the reductions must be achieved

ReFuelEU Aviation main points:

- Scaled implementation of Sustainable Aviation Fuels (SAF) to be provided at EU airports
- Requirement currently applies to intra-EU flights



EU Policy Developments since 2021

Mandatory reduction of carbon intensive technologies

Heavy Duty Vehicle (HDV) and Light Duty Vehicle (LDV) CO_2 Standards

HDV and LDV CO_2 standards are a mandatory requirement for vehicle manufacturers in Europe to decrease the emissions from their new vehicles by increasing the proportion of low carbon vehicles they produce. In February 2023, the European Commission proposed more ambitious greenhouse emission reduction standards for both HDV and LDV manufacturers.

Original HDV CO_2 Standards (reductions relative to 2019 levels)	
2025	15% Reduction
2030	30% Reduction

Proposed HDV CO_2 Standards (reductions relative to 2019 levels)	
2030	45% Reduction
2035	65% Reduction
2040	90% Reduction

Financial penalties for breaking the HDV CO_2 standards are large and are designed to incentivise vehicle manufacturers to produce low carbon vehicles.
While HDV and LDV CO_2 standards apply to vehicle manufacturers, the standards will be important for PDA mobility projects as alternative fuel ready vehicles will become a larger proportion of new vehicles manufactured.

Projected number of EU zero-emission vehicle required on the road to meet HDV CO_2 standards. ACEA Factsheet

CO_2 HGV reduction targets	30%	40%	50%
Number of zero-emission vehicles required on the road (minimum)	280,000	390,000	465,000
Number of Battery Electric Vehicles	230,000	320,000	380,000
Number of Fuel Cell Electric Vehicles	50,000	70,000	85,000

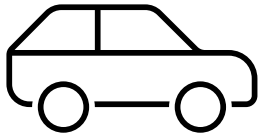
EU Policy Developments since 2021

Clean Vehicles Directive (CVD)

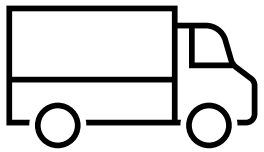
Mandatory reduction of carbon intensive technologies

The Clean Vehicle Directive (CVD) sets minimum percentage adoptions of low-emission cars, vans, trucks and buses in public procurement, subject to adoption into national law.

EU member states have adopted national targets for procuring clean vehicles. Many countries plan to go further than the minimum vehicle adoption percentages described in the CVD.



LDV Clean Vehicle Definition
From 2026, only zero tailpipe emission vehicles will count as clean light duty vehicles



HDV Clean Vehicle Definition
Any HDV that makes use of alternative fuels including hydrogen, electricity, biofuels and synthetic fuels

Minimum percentage of total vehicles in a member state which must meet the clean vehicles standards. Different vehicle categories have different minimum percentages.

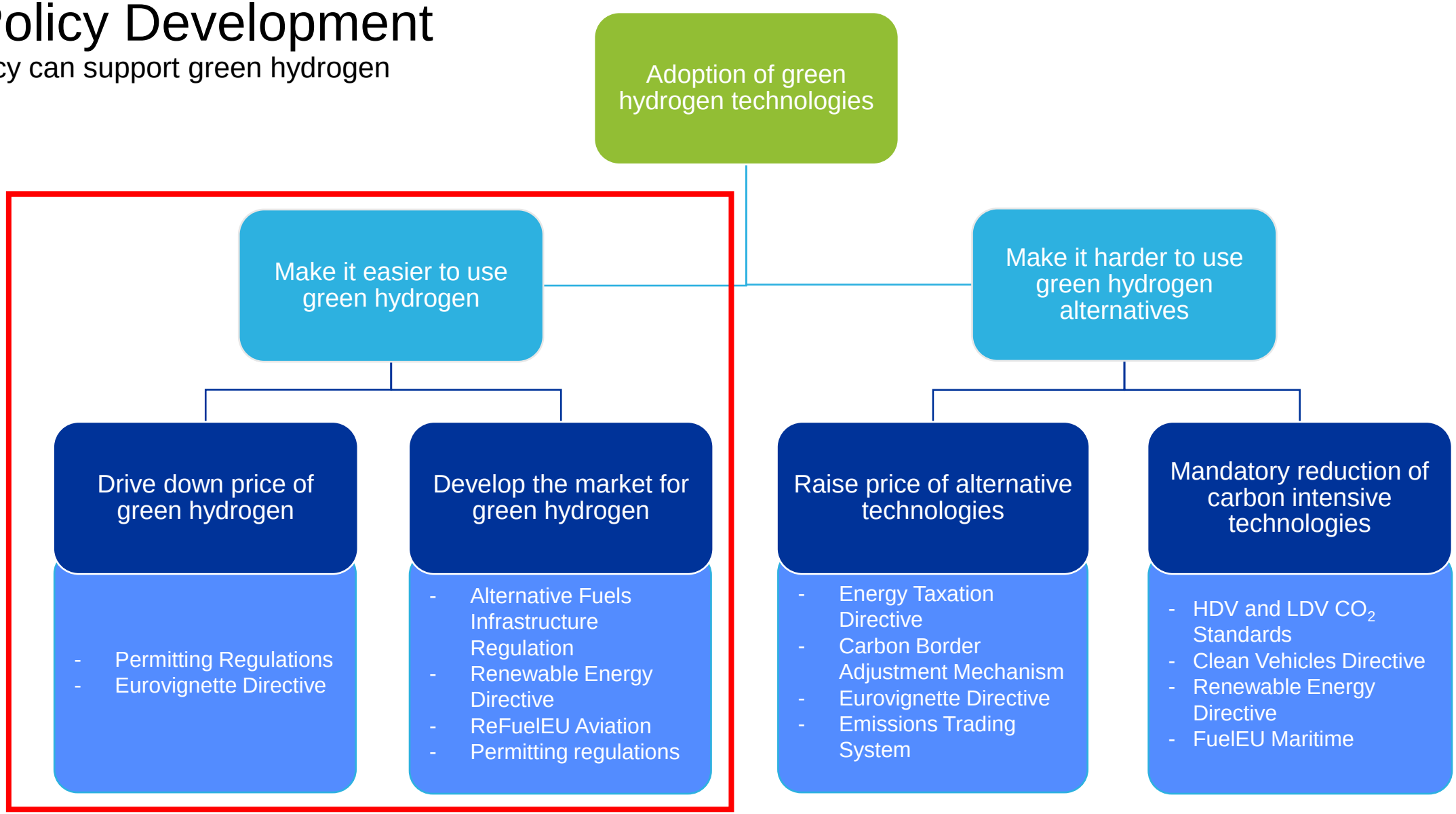
Vehicle Category	2025	2030
Trucks (N2 and N3)	6%-10%	7%-15%
Buses (M3)	29%-50%	43%-75%
Cars & vans (N1)	16%-35%	17.6%-38.5%

Advice for PDA Project Team

Consider national targets for clean vehicles adopted into national law. For mobility-focused PDA projects, vehicles should be usedwhich meet the CVD standards (see above) and will contribute towards national clean vehicle numbers. If projects can support member states to meet their clean vehicle targets, there is an improved case for public sector financial support for the project.

EU Policy Development

How policy can support green hydrogen



EU Policy Developments since 2021

Alternative Fuels Infrastructure Regulations (AFIR)

Develop the market for green hydrogen

The Alternative Fuels Infrastructure Regulation (AFIR) was implemented in March 2023 where it replaced the Alternative Fuels Infrastructure Directive (AFID). AFIR requires the building of infrastructure to support electric and hydrogen vehicles.

Hydrogen infrastructure requirements

Hydrogen refuelling stations must be built every 200km along the TEN-T network and in all urban nodes by 2030. These facilities will be required to serve both cars and lorries.

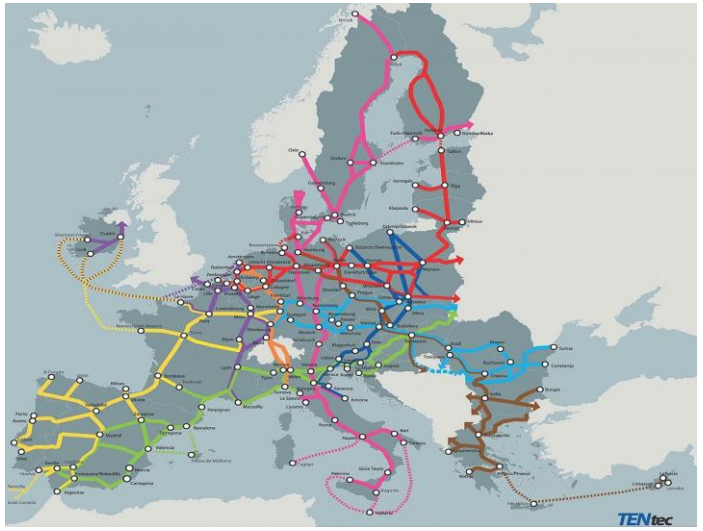
Advice for PDA Project Team

- **Establish if projects lie along the comprehensive TEN-T network.** The mandatory requirement for hydrogen infrastructure along this network should form a part of the project development decisions in this case.
- **Aligning PDA projects which are not co-located with the TEN-T network with EU wide refuelling infrastructure.** This will allow for better integration with the wider EU network and use technologies developed along the TEN-T network.
- Ensure the any refuelling infrastructure deployed to meet AFIR is **aligned with the size, location, and technical requirements of AFIR.**

Requirements of hydrogen refuelling stations under AFIR
❖ 1 tonne per day capacity of hydrogen
❖ 700 Bar pressure gaseous hydrogen dispenser
❖ No more than 200km distance between hydrogen refuelling stations along TEN-T network
❖ Refuelling stations must be publicly accessible and able to serve both Light Duty Vehicles and Heavy Duty Vehicles

The TEN-T comprehensive network

The network connects all EU member states.



EU Policy Developments since 2021

Funding the Alternative Fuels Infrastructure Regulations (AFIR)

The Connecting Europe Facility (CEF) is an EU funding instrument designed to support the EU's green deal and decarbonisation goals. CEF's transport division has EUR 25.81 billion budget to help develop the TEN-T network and the objectives of AFIR. EUR 11.29 billion of that budget is reserved for EU cohesion countries.

Alternative Fuel Infrastructure Facility (AFIF)
Funding is available for projects which support the Alternative Fuels Infrastructure Regulations' aim through the CEF Transport program, the Alternative Fuel Infrastructure Facility (AFIF). AFIF's total budget is EUR 1.5 billion. CEF Transport funding requires the involvement of a financial institution such as the European Investment Bank (EIB) to conduct financial checks on the project. This requires early engagement with applications as financing approval letters may take up to 6 months to acquire.

Projects with specific aims can be supported under the AFIF call

- Projects supporting the roll-out of hydrogen refuelling infrastructure on the TEN-T road network, with priority to long-haul heavy-duty transport
- Projects supporting the roll-out of hydrogen refuelling and electricity recharging infrastructure dedicated to public transport and heavy-duty vehicles in urban nodes
- Actions supporting the deployment of alternative fuels for TEN-T maritime ports, inland waterways and inland ports, and airports

Develop the market for green hydrogen

AFIF Application Requirements

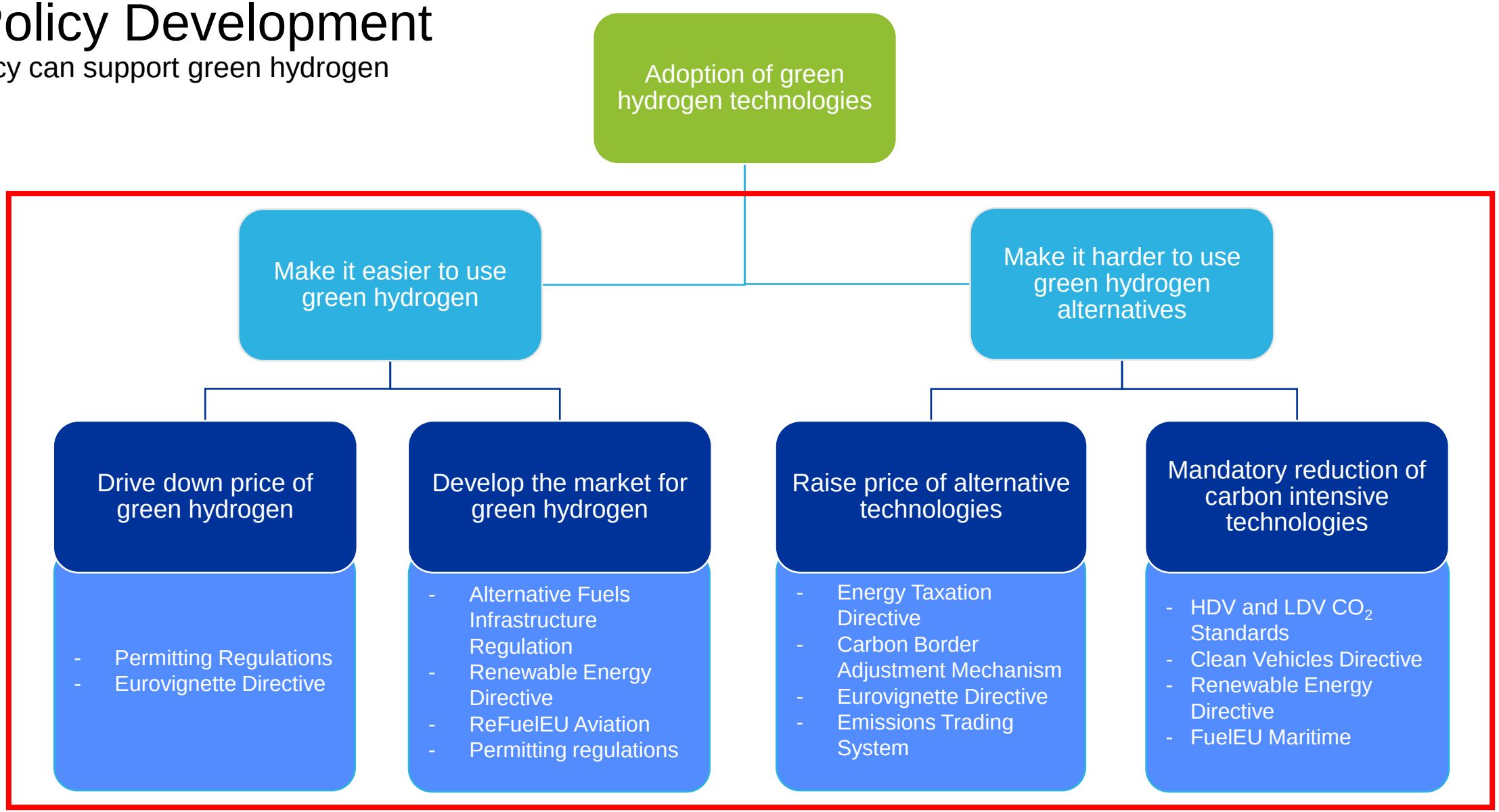
- Completed application form
- Detailed budget table
- Activity reports of last year – list of previous projects (key projects for the last 4 years)
- Timeline/Gantt chart
- Letters of support from the Member States (up to 3 months lead time)
- Environmental compliance file
- Financing approval letter from financing partners (up to 6 months lead time)
- Simplified cost-benefit analysis (CBA)

Advice for PDA Project Team

PDA mobility projects, should consider funding opportunities through CEF Transport. CEF Transport has separate funds reserved for EU cohesion countries. The AFIF call is a detailed application, and will require time investment, but it is a good opportunity to align projects with AFIR objectives and to access public funding for projects.

EU Policy Development

How policy can support green hydrogen



EU Policy Developments since 2021

Emergency Regulations related to Renewable Energy permitting

Drive down price of green hydrogen

Develop the market for green hydrogen

Emergency regulations were implemented in December 2022 to speed up development of renewable electricity projects in EU states. Many projects are awaiting permits to begin development. The emergency regulations set out maximum limits on the time to consider permit applications. These emergency regulations are planned to be adopted formally as part of an update to the Renewable Energy Directive (RED III). Faster permitting accelerates the deployment of renewable projects and reduces their cost. The table below shows some of the permitting regulations planned as part of the RED III update.

Method of emergency regulation to speed up permitting	Example of method planned as part of RED III update
Emergency permitting regulation	❖ 1 month time limit to consider applications for <50kW solar projects ❖ Automatic approval after 1 month
Renewable Acceleration Areas (RAAs)	❖ Region in which environmental assessments can be simplified leading to faster permit approvals
Digitisation of applications	❖ All permitting processes to be digitised to reduce administrative burden

Advice for PDA Project Team

PDA projects could benefit from co-location with RAAs or developing links with renewable energy suppliers within their nation's RAAs. Direct renewable electricity supply could be accelerated by reduced permitting requirements within RAAs while power purchase agreements could be established in a shorter timeframe with national suppliers located within RAAs. **PDA project teams should investigate where their national RAAs are planned and advocate for their development in nearby regions.**

EU Policy Developments since 2021

Drive down price of green hydrogen

Raise price of alternative technologies

Eurovignette Directive

The Eurovignette Directive sets out a framework for road tolls across Europe. It creates an HGV toll system based on distances travelled on toll roads and greenhouse gas emissions of vehicles.

Toll charges will increase for the most heavily emitting HGVs and will be subsidised for low and zero-emission vehicles. Toll charges on an HGV can amount to EUR 10,000s per year.

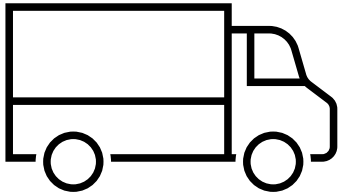
Advice for PDA Project Team

The Eurovignette Directive presents an additional end-user tool to incentivise the adoption of low-carbon hydrogen-powered vehicles. PDA Project Teams should understand plans for the national adoption of the Eurovignette directive and how this can improve the business case for their project.

Vehicle definition	Toll reduction compared to most polluting vehicles
Most polluting vehicles	0%
CO2 emissions more than 50% below most polluting vehicles	30 - 50%
Zero Emission Vehicles	50 - 75% (100% until 2025)

Diesel Truck

Up to EUR 25,000 in tolls per year



Hydrogen Fuel Cell Truck

Less than EUR 12,500 per year

EU Policy Developments since 2021

Renewable Energy Directive II/III (RED II/III)

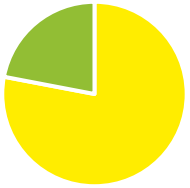
Develop the market for green hydrogen

Mandatory reduction of carbon intensive technologies

The Renewable Energy Directive (RED) II laid out renewable energy targets for EU nation states to adopt into national law. RED identifies specific sector aims for power and industry. With the invasion of Ukraine, renewable energy plans have been accelerated as part of the RePowerEU objectives. What is now termed RED III is a provisional agreement of a revision of RED II which sees the following regulatory changes:

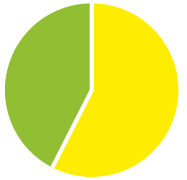
- Raises the EU's renewable energy mandatory target for 2030 to a minimum of 42.5% of total energy use in the EU.
- Raises the aim of renewable energy target to 45% of total energy use in the EU by 2030.
- Definition of Renewable Fuels of Non-Biological Origin (RFNBOs) established. RFNBOs are fuels produced using renewable energy sources other than biomass such as green hydrogen, green ammonia, or e-fuels.
- The RFNBO definition would apply to all sectors instead of only applying to the transport sector. This would bring a consistent definition to EU regulations.
- Binding target to reach 42% of RFNBO standard hydrogen in total hydrogen consumption in industry by 2030.
- For the transport sector, a target of 1% of total energy should be from RFNBO sources and a combined target of 5.5% of total energy should be from RFNBO and advanced biofuel sources by 2030.

EU energy sources in 2021



- Other Energy Sources
- Renewable Energy Sources

Minimum targets for EU energy sources in 2030



- Other Energy Sources
- Renewable Energy Sources

Advice for PDA Project Team

It is important that hydrogen produced through PDA projects meets “green” hydrogen standards as defined under RED. This will allow end-users of the hydrogen to demonstrate the use of clean fuels. Green hydrogen can be produced as a RFNBO or as a biofuel and PDA teams should speak with their consultancy teams to determine the best individual approach for hydrogen production

EU Policy Developments since 2021

Renewable Energy Directive II/III (RED II/III) hydrogen from biological sources

Defining biofuels under RED II/III

Biofuels are described as transport fuels produced from biomass and include fuels such as biodiesel. Hydrogen produced from a biomass feedstock can be considered as a biofuel if it meets the requirements for biofuels under RED II.

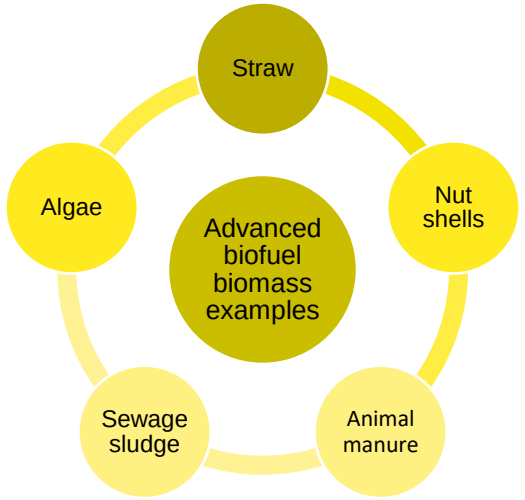
Biofuels and Advanced Biofuels

'Traditional' biofuels used in Europe are from food stock biomass, such as palm oil, sunflower oil, and soy. Advanced biofuels are a subset of biofuels which are produced from waste biomass or from algae. These biofuels are usually more sustainable and the provisional agreement for RED III will require a minimum adoption of advanced biofuels. RED III also places limits on the use of traditional food stock biofuels for member states.

Advice for PDA Project Team

For PDA projects looking to use biofuel hydrogen, teams should speak with their consultants to determine which biofuel feedstocks could be used in the project. Member states have individual caps on food-crop derived biofuels and certain advanced biofuel technologies will require more development before they can be deployed commercially.

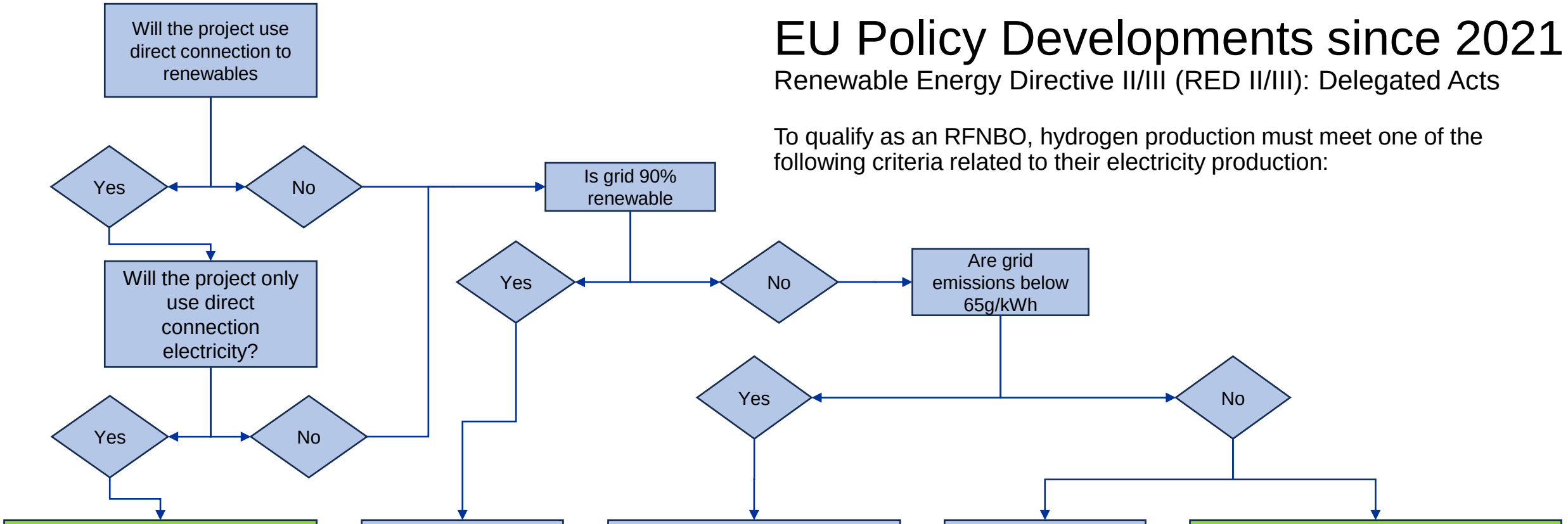
Requirements for Biomass Hydrogen under RED II
65% greenhouse gas emissions savings relative to conventional fossil fuels for biofuel plants entering operation after January 2021
Biofuels cannot use feedstock grown on land with high biodiversity status or high carbon content, such as woodlands, or wetlands
Certain food crop-based biofuels have percentage caps for their use under the Indirect Land-use Change Directive. These crops are required for food or animal feed, and their use as a biofuel leads to the conversion of more land to farmland to grow the displaced food stock. This leads to indirect greenhouse gas emissions.



EU Policy Developments since 2021

Renewable Energy Directive II/III (RED II/III): Delegated Acts

To qualify as an RFNBO, hydrogen production must meet one of the following criteria related to their electricity production:



Direct connection to renewable electricity supplier

Electricity supplied via direct connection to renewable electricity source must meet the following criteria:

- By 2028, project's renewable electricity source must have been built within 36 months of hydrogen project start-up.

Grid electricity

If 90% or higher of the sources of electricity for a grid are renewable, no restrictions apply to grid electricity use. Grid electricity can be used for hydrogen project.

Grid connection but PPA agreement required

For low-carbon electricity grids which are not powered by renewables (i.e. large contribution from nuclear power), hydrogen projects are required to enter PPA with a renewable electricity provider but existing renewable power suppliers can be used.

Curtailed renewable electricity

Using grid electricity matched to existing renewable electricity production at times where this electricity would otherwise have been curtailed.

Additionality and matching requirements for grid electricity connection

A PPA with a renewable energy supplier which has been set-up within 36 months of the hydrogen production facility set-up and within the same electricity market bidding zone. Additionally, electricity must be time matched with the renewable energy supplier. Initially, this must be matched monthly, but after 2030, hourly matching will be required.

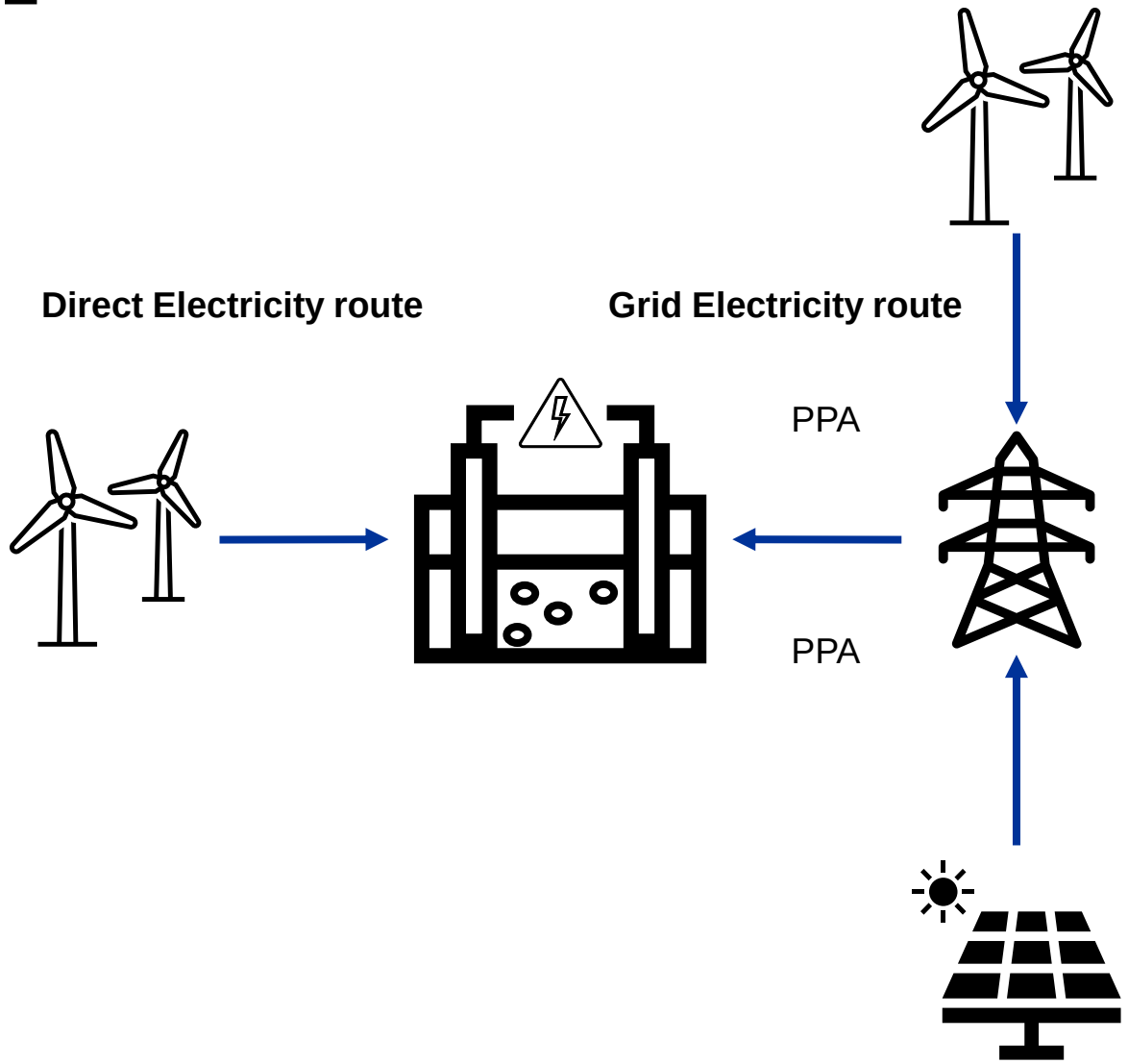
EU Policy Developments since 2021

Renewable Energy Directive II/III (RED II/III): Delegated Acts

Advice for PDA Project Team

Projects will most likely use a localised direct renewable energy power supply or a PPA agreement with additionality and matching requirements for grid electricity for their hydrogen production.

- The direct supply route is simpler and will not require payment of grid fees or establishing grid connections. When direct renewable electricity is produced, it can be used for hydrogen production which will meet RFNBO standards.
- Grid connected options allow easier expansion and a more reliable source of electricity than the direct route. Hydrogen producers can enter several PPAs with different renewable energy sources for a more reliable supply of electricity.
- The use of curtailed renewables is not advised to form part of the PDA project strategy as proving that renewable electricity would be curtailed is difficult to demonstrate and this route provides the least certainty of supply.



EU Policy Developments since 2021

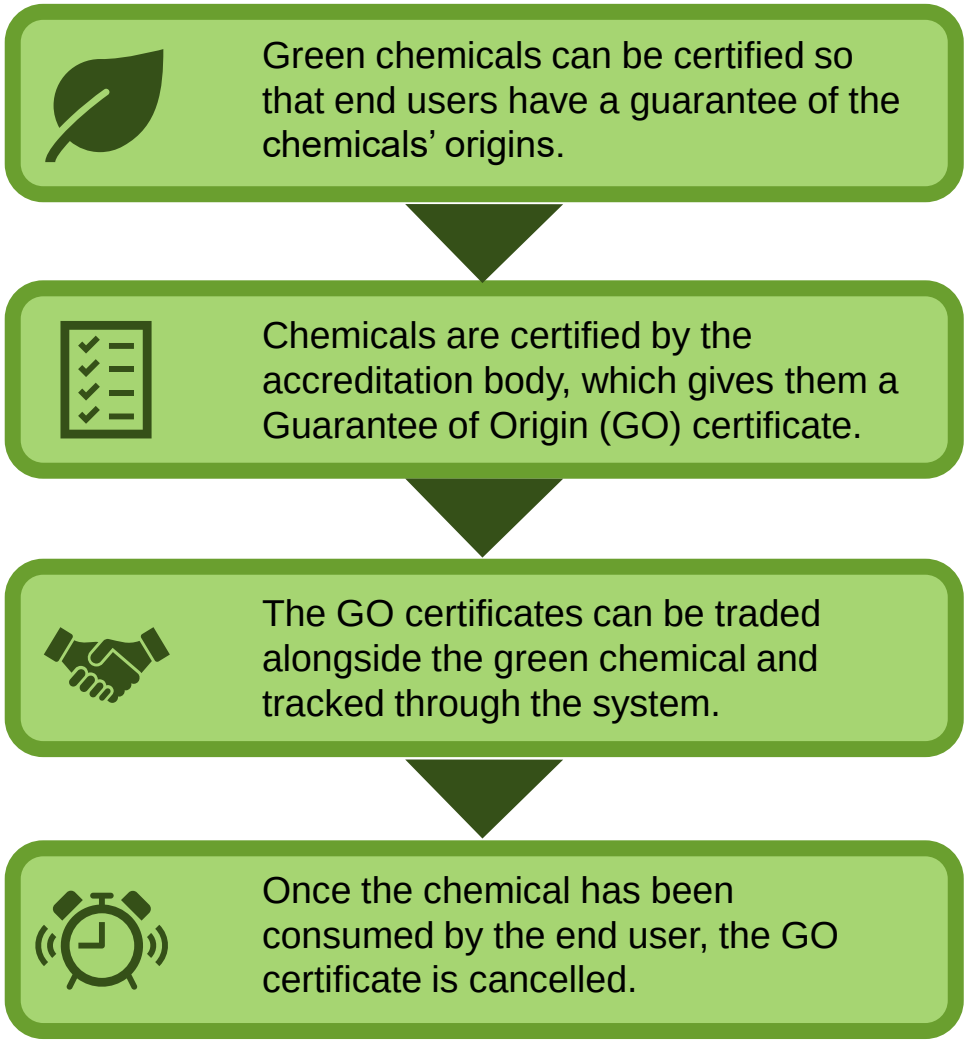
Renewable Energy Directive II/III (RED II/III): CertifHy

Certification of hydrogen

CertifHy is developing an EU Voluntary Scheme for the certification of hydrogen as an RFNBO (Renewable Fuel of Non-Biological Origin) according to the European Renewable Energy Directive (RED). These certificates will allow consumers to track hydrogen's origin and environmental attributes. CertifHy has been initiated at the request of the European Commission and is financed by the Clean Hydrogen Partnership.

Advice for PDA teams

CertifHy will provide Guarantee of Origin (GO) certificates to prove that hydrogen produced through PDA projects meets RFNBO standards as defined under RED. This will allow producers of the hydrogen to demonstrate that the hydrogen that they produce is a clean fuel. Green hydrogen producers must register to become an Account Holder. A description of how to become an Account Holder can be found here. Once you are a registered Account Holder, you can register a device and receive GO certificates.



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Examples of directive implementation

Germany Case Study

In countries where EU Directives have not yet been implemented, advocacy from interested projects such as the PDA projects is advised. Understanding how hydrogen policies have been implemented in other member states can be used as a basis for what policies PDA projects should advocate for. The below table details some of the policies implemented in Germany to create a supportive environment for hydrogen projects.

Carbon Contracts for Difference	Greenhouse Gas Reduction Quota in the Transport Sector
❖ Germany adopted a EUR 50 Billion carbon contracts for difference industrial program to incentivise hard to abate industries to adopt low carbon methods. ❖ Companies will be given subsidies to enable low-carbon technologies to remain competitive with fossil fuel-based companies in the same sector.	❖ Introduced a requirement for suppliers of transport fuels to reduce greenhouse gas emissions by 25% by 2030 relative to 2010 emissions. ❖ A new emphasis of achieving this aim through electric vehicles has been presented.
EU Hydrogen Strategy Implementation in Germany	**Abolition of the Renewable Energy Sources Act surcharge**
❖ Germany adopted the Climate Action Program 2030 and the new Climate Action Act which binds the country to a 55% reduction in carbon emissions relative to 1990 levels by 2030 in keeping with the Fit for 55 targets. ❖ The Clean Vehicles Procurement Act similarly entered the CVD into German law. ❖ The Federal Highway Toll Act has been amended to determine tolls based on CO_2 emissions of HDV to meet the new Eurovignette Directive requirements.	❖ Germany has removed a levy for renewable electricity provided through the grid to ease the cost burden on consumers. ❖ Prior to this, payments of EUR 0.0372/kWh were being paid for grid electricity of renewable sources. ❖ The levy fees were used to subsidise further renewable energy projects. ❖ Eliminating the levy will make green hydrogen from electrolysis cheaper.

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Hydrogen project subsidies

EU funding tools for hydrogen projects

Capital grants provided to low carbon hydrogen technology deployment projects allow an improved business case with greater certainty, which can enable investment in early projects while costs are still high. However, applications to capital grant funds are often highly competitive. The table below presents some of the larger EU funding programs available for hydrogen projects. There may also be national or regional funding schemes which are not included here.

Capital Fund	Amounts available	Description	Application window
Innovation Fund-Large Scale projects	EUR 3 Billion	The Innovation Fund focuses on delivering European climate policies with a focus on the energy and industrial sectors. Innovative and flagship projects are supported through the scheme. The Fund is split into two categories: Large Scale Projects (project budgets greater than EUR 7.5 Million) and Small Scale Projects (project budgets smaller than EUR 7.5 Million)	Nov-Mar
Innovation Fund-Small scale projects	EUR 100 Million		Mar-Sep
Connecting Europe Facility Transport AFIF call	EUR 1.5 Billion	Funding is provided to projects which support the aims of the Alternative Fuels Infrastructure Regulations. Projects which support the development of hydrogen refuelling stations will be eligible to apply.	Until Nov 2023
Clean Hydrogen Partnership	EUR 195 Million (2023 call)	The partnership supports the development of hydrogen projects in Europe through a series of specific calls related to production, storage and distribution, and transport hydrogen projects. Projects must meet the specific call requirements, which are released annually.	Jan-Mar (2023 call)
Horizon Europe - Climate Energy and Mobility cluster	EUR 15.123 Billion	This is a broad funding program with the aim of funding research and innovation in the EU. Horizon Europe funds are grouped in clusters to address specific areas of development. The Climate Energy and mobility cluster should be considered for PDA hydrogen projects.	Program specific
European Hydrogen Bank	EUR 800 Million	The EHB is planned to be operating in Autumn 2023. It will provide a fixed premium per kilogram of green hydrogen produced for 10 years to successful projects. Green hydrogen production projects will be eligible to apply.	More details later this year

Where to find financial subsidies for PDA projects

EU Cohesion Policy Funds

A group of Cohesion policies have allocated funds towards cohesion countries and regions within the EU. Cohesion countries are identified as member states with gross national income below 90% of the EU average. Cohesion Regions are identified with a similar GDP metric as detailed in the below table.
The funds are not specifically targeted at the development of hydrogen but are intended to assist with the delivery of EU climate and infrastructure policies. National strategies for the inclusion of hydrogen projects in cohesion policy fund applications may be required to support PDA project funding.

Cohesion Policy Funds

- European Regional Development Fund: Regional project funding with goals including “greener” development
- Cohesion Fund: Funds capital intensive environmental and transport projects in EU cohesion countries
- European Social Fund: Will support the creation of jobs and training for specific projects (including hydrogen project development)
- Just Transition Fund: Supports regions affected by climate transition policies to reach their net zero targets.

Region Type	Percentage of EU average GDP per person
Less developed regions	Less than 75%
Transition regions	75%-90%
More developed regions	More than 90%

Advice for PDA Project Team

Investigate the Hydrogen Public Funding Compass for regional, national, and EU wide funding opportunities
The European Commission has designed the compass as a tool to find public funding for low-carbon hydrogen projects such as the PDA projects. If a member state’s hydrogen funds are missing from the compass, PDA teams should advocate for national bodies to send information to the Hydrogen Public Funding Compass.

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Producing green hydrogen

Hydrogen projects have a stronger business case when they contribute towards national targets for hydrogen production and utilisation across the industry, mobility, and power sectors. To meet these standards, projects must first ensure that they are producing "green" hydrogen:

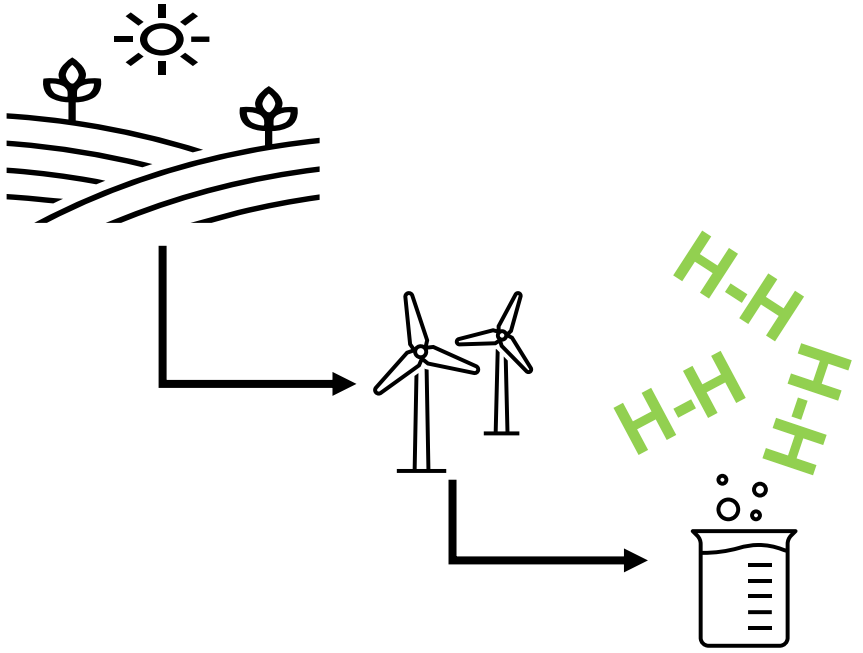
- **Hydrogen produced should meet standards under the Delegated Acts of the Renewable Energy Directive (RED) for RFNBOs or requirements for biofuels set out in RED.** These provide definitions under which hydrogen will be considered as "green". Projects should produce "green" hydrogen if they are to contribute towards targets and access credits for green hydrogen (which improves the project business case). Project teams should consider different production methods, and the green hydrogen credits available for each method, when developing their plans.

- Under RED's Delegated Acts, specific requirements for renewable electricity supply are identified. **Hydrogen production should consider either a direct supply route of renewable electricity or enter PPAs with different renewable energy providers locally.**

- To meet the constraints of electricity production under the Delegated Acts, it is important that projects are powered by new local renewable electricity sources. **To accelerate the deployment of new local renewable electricity sources, project teams should encourage member states to implement Renewable Acceleration Areas (RAAs) ahead of RED III implementation.**

Advice on this slide related to the following policies:

- RED II Delegated Acts for the definition of RFNBOs
- RED II requirements for biofuels
- RED II Delegated Acts for the renewable electricity conditions required as part of RFNBO standards
- Emergency Regulations related to Renewable Energy permitting for RAAs



Recommendations for project teams

Reframing projects to consider EU policy objectives

EU policy objectives is often aligned with renewable hydrogen project objectives. This present an opportunity for projects to improve their case for public investment by aligning with broader EU goals. Projects should encourage the national adoption of EU policies which improve their business case:

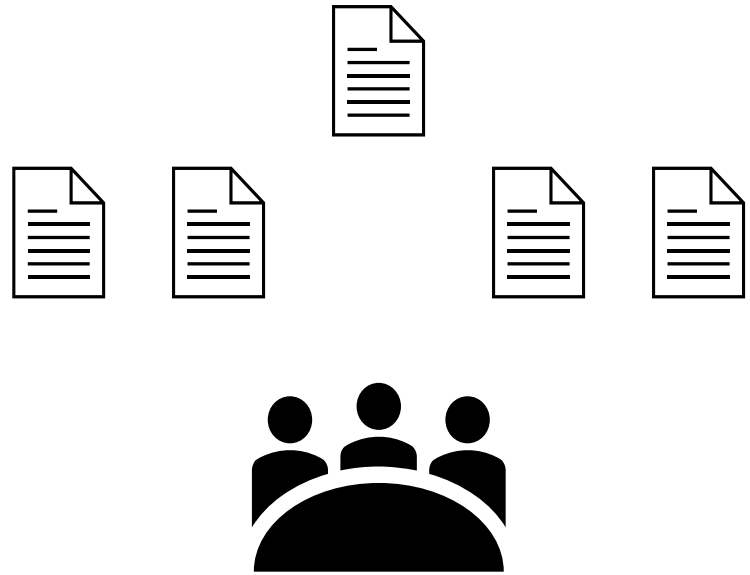
- The Eurovignette Directive encourages the adoption of low carbon HDV vehicles which will be exempt from certain road tolls. **PDA projects should encourage the national implementation of the Eurovignette Directive to expand the national market for hydrogen-powered heavy-duty vehicles.**

- For mobility projects, **vehicles which are compliant with CVD standards should be used.** Member states have minimum percentage adoptions of clean vehicles outlined under the CVD. Mobility projects can enable nations to meet their minimum clean vehicle adoption percentages and thus encourage public investment.

- **Refuelling infrastructure should meet the technical standards for hydrogen refuelling stations under AFIR.** Projects will benefit from meeting this standard as this will allow better integration with the wider EU network and make use of mature technologies developed under AFIR requirements. Further, the case for public investment in projects is improved by enabling member states to meet AFIR requirements.

Advice on this slide related to the following policies:

- Eurovignette Directive
- Clean Vehicle Directive (CVD)
- Alternative Fuel Infrastructure Regulation (AFIR)



Recommendations for project teams

Accessing financial subsidies

The business case for green hydrogen fuels is not yet cost-competitive with more emissions-intensive technologies. Financial subsidies for hydrogen projects can go a long way to make green hydrogen projects more cost-competitive. There are public funding mechanisms at national, regional and EU levels which PDA projects may apply for:

- **Project teams should investigate the Hydrogen Public Funding Compass.** The compass aims to centralise information on all available public funds for hydrogen projects in the EU.

- **If member state public funding information for hydrogen projects is not available on the Funding Compass, project teams should encourage national bodies to provide this information.** Improving the funding compass tool will help to enable more hydrogen projects in member states and so improve the business case for all hydrogen projects nationally.

- The delivery of the AFIR regulation in EU cohesion countries is being supported by the Connecting Europe Facility (CEF) Transport. **Mobility projects should investigate the CEF Transport funding opportunities as a primary tool for funding and seek to understand the application requirements early in the process.**

- Cohesion policy funding opportunities can be targeted towards regional hydrogen projects if member states identify these projects as appropriate use of funds. **Projects should encourage member states to support funding of hydrogen projects through cohesion policy funding.**

Advice on this slide related to the following policies:

- EU funding tools for hydrogen projects
- EU Cohesion Policy Funds
- Funding the Alternative Fuels Infrastructure Regulations (AFIR)

Clean Hydrogen Partnership

Co-funded by the European Union

Thank you very much for your attention!