

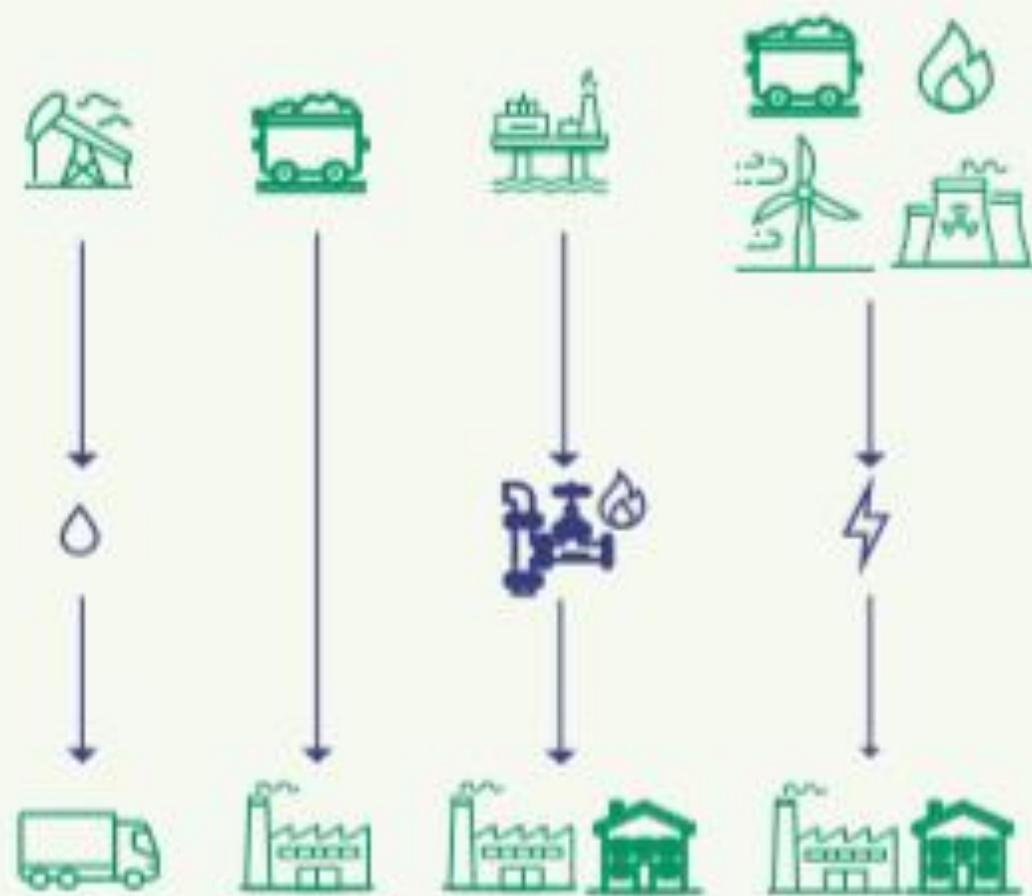


The revision of the TEN-E Regulation and the role of hydrogen

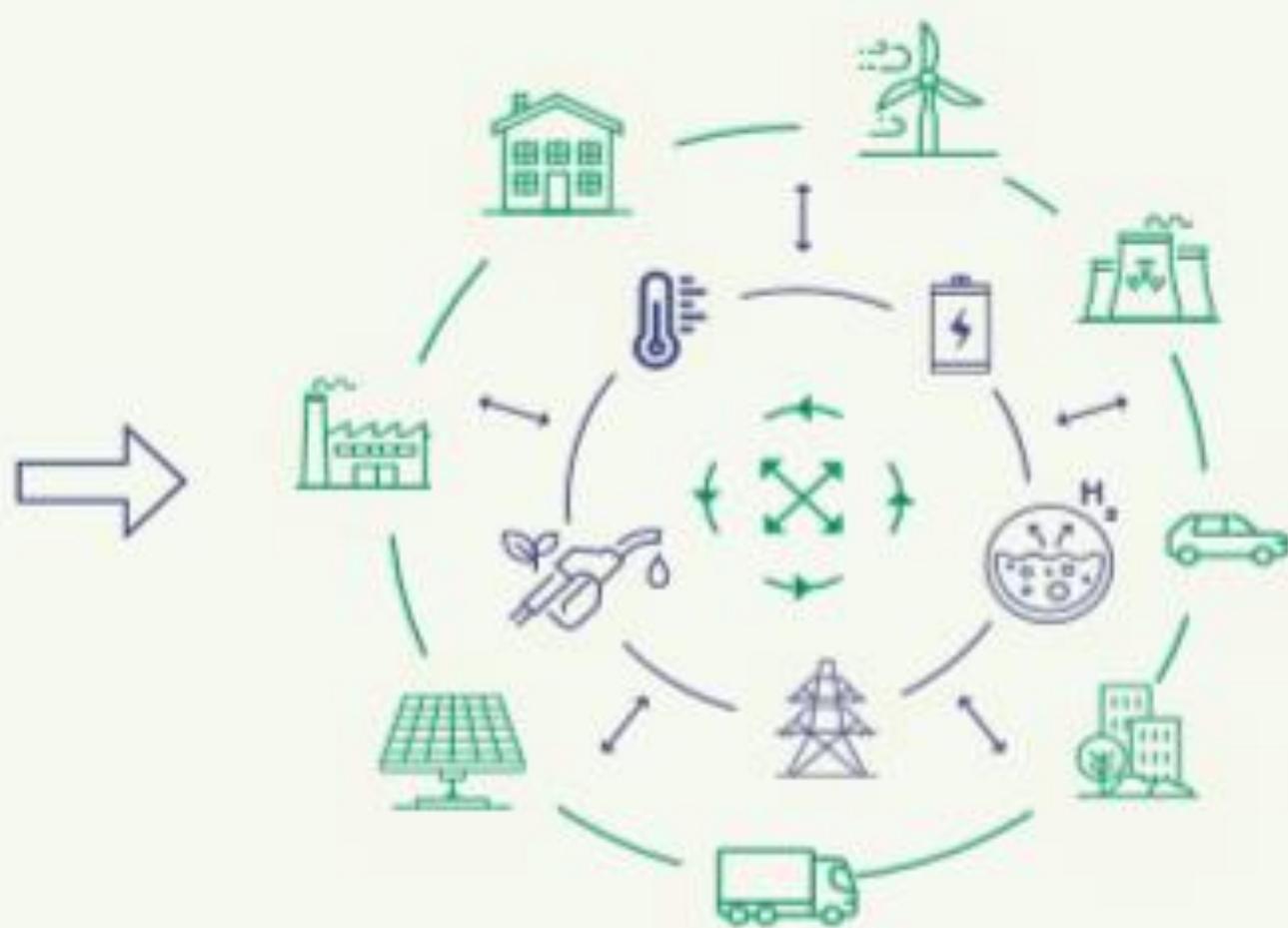
Tomasz Bąk, Policy Analyst, European Commission, DG Energy

2 December 2021

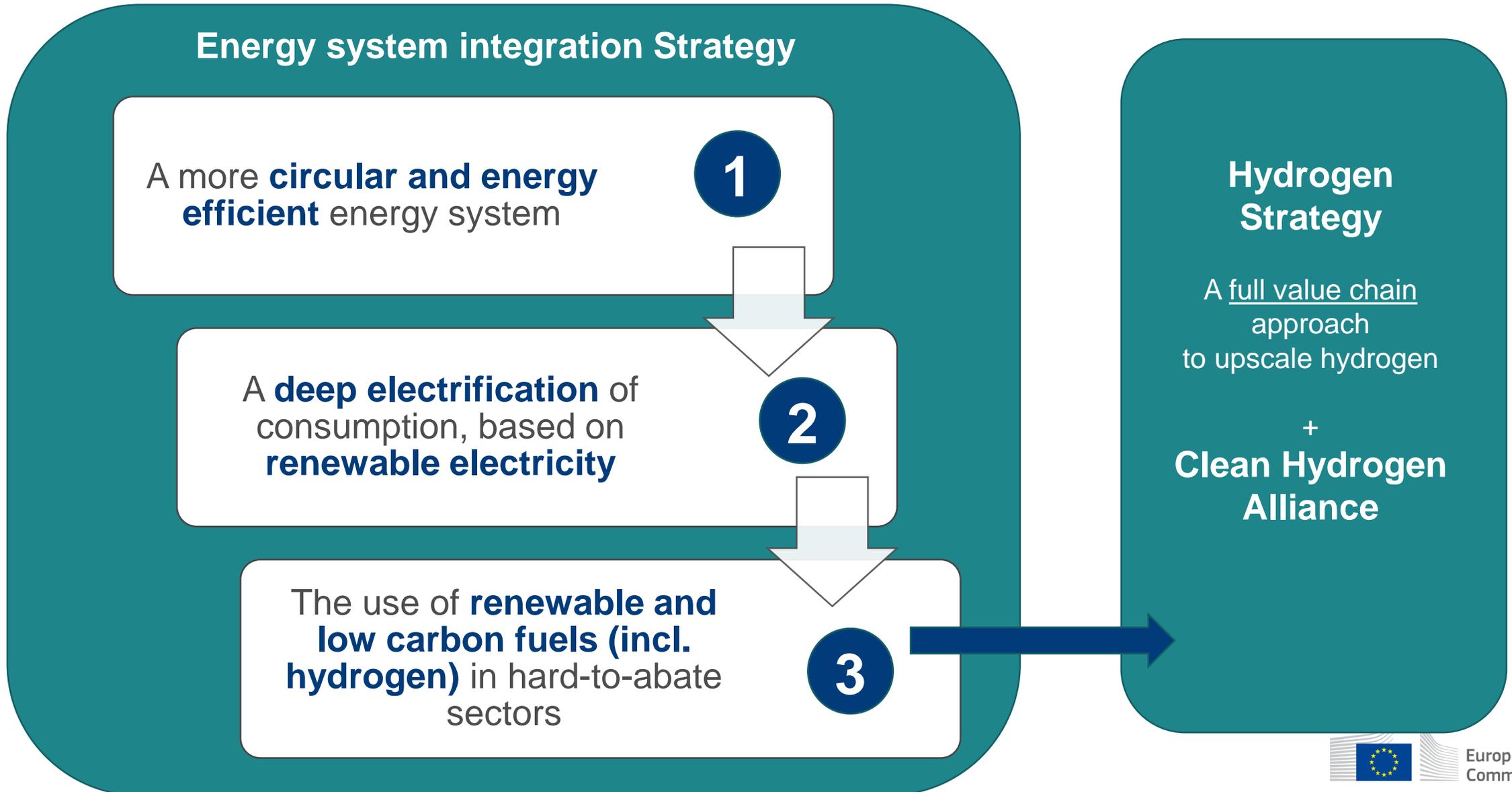
The energy system today : linear and wasteful flows of energy, in one direction only



Future EU integrated energy system : energy flows between users and producers, reducing wasted resources and money



Laying the foundation for a climate-neutral energy system



Application areas for hydrogen

Segments

Key subsegments

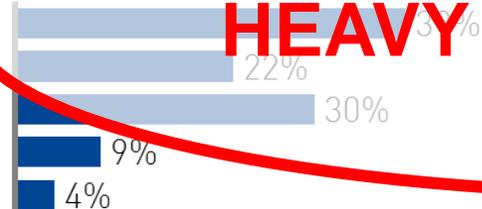
Relative importance by 2050¹

Complementary decarbonization solutions



Transportation

- Large cars (fleets) and taxis
- Trucks and buses
- Light commercial vehicles
- Trains
- Ships and aviation



- Battery electric vehicles
- Plug-in hybrid electric vehicles



Heating and power for buildings

- Hydrogen blending for heating
- Pure hydrogen grids for heating



- Electrified trains
- Biofuels and CNG/LNG
- Electrification of heating via heat pumps
- Energy efficiency measures
- Biogas/biomass



Industry energy

- High-grade heat

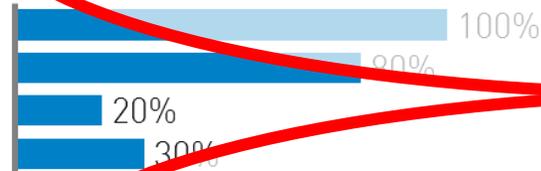


- Demand side and energy efficiency measures
- Electrification
- Biogas/biomass



Industry feedstock

- Ultra-low-carbon hydrogen as feedstock for
 - Ammonia, methanol
 - Refining
- Feedstock in steelmaking (DRI)
- Combined with CCU in production of olefins and BTX



- Electrification
- Biogas/biomass
- Carbon capture
- For steel:
 - Coke from biomass
 - CCS on blast furnace
- For CCU:
 - Carbon storage



Power generation

- Power generation from hydrogen
- Flexible power generation from hydrogen



- Biogas
- Post-combustion CCS
- Gate-to-gate

HEAVY DUTY TRANSPORT

INDUSTRY

RENEWABLES INTEGRATION

¹ In transportation: percent of total fleet; in heating and power for buildings: percent of total heating demand; in industry energy: percent of final energy demand; in industry feedstock: percent of total feedstock for production; in power generation: percent of total power generation and percent of power generated from natural gas

The Hydrogen Strategy – a roadmap to 2050

2024

- 6 **GW** of renewable hydrogen electrolyzers
- Replace **existing hydrogen production**
- Regulation for liquid hydrogen markets
- Planning of hydrogen infrastructure

2030

- **40 GW** of renewable hydrogen electrolyzers
- New applications in **steel and transport**
- Hydrogen for electricity balancing purposes
- Creation of “Hydrogen Valleys”
- Cross-border logistical infrastructure

2050

- Scale-up to **all hard-to-decarbonise sectors**
- Expansion of hydrogen-derived **synthetic fuels**
- EU-wide infrastructure network
- An open international market with € as benchmark

Making it happen – an action plan for the Hydrogen Strategy

Full value chain approach	Actions oriented towards
An investment agenda	<ul style="list-style-type: none">• Create project pipeline through the Clean Hydrogen Alliance• €220-340bln renewable power, €24-42bln electrolysers, €65bln infrastructure
Boosting demand and scale up production	<ul style="list-style-type: none">• Comprehensive terminology and EU-wide certification of hydrogen• Support schemes and CCfD for renewable and low-carbon hydrogen• Demand-side policies in end-use sectors
Develop hydrogen infrastructure and markets	<ul style="list-style-type: none">• Planning of hydrogen transport and storage infrastructure• Rules ensuring competitive markets, enabling infrastructure development (incl. repurposing) whilst retaining integrity of internal gas market
Research and Innovation	<ul style="list-style-type: none">• Clean Hydrogen Partnership established• Scale up electrolysers and develop hydrogen value chain• Continue to support innovative hydrogen technologies
The international dimension	<ul style="list-style-type: none">• International standards, regulation and definitions for hydrogen• Promote cooperation

Hydrogen – an investment agenda

Next Generation EU, Invest EU, Cohesion Policy, CEF-E, CEF-T
ETS Innovation Fund, Horizon Europe

Renewable electricity
production

€220-340 BLN

Renewable
hydrogen

€24-43
BLN

Hydrogen
transport,
distribution,
and storage

€65 BLN

Transport
(HDV)
€13 BLN

Steel
€8 BLN

European Clean Hydrogen Alliance

TEN-E revision – policy context

- Energy infrastructure as a key pillar of EU energy policy to deliver the European Green Deal
- TEN-E Regulation to be fully aligned with the 2050 climate neutrality objective
- Important progress made in the implementation of trans-European energy infrastructure
- New policy challenges such as the accelerated take-up of renewable energy sources and system integration
- Strong stakeholder support for the revision to align the TEN-E policy framework with the new policy context

Trans-European energy networks at the heart of European energy policy

Market integration

Security of supply

Sustainability

Competitiveness



CO2 transport
E-highways
Smart grids

Criteria / CBA

Regional cooperation &
High Level Groups

Union List of PCIs

Accelerated
permit
granting

Regulatory
measures

EU financial
assistance

Full alignment of infrastructure with the EGD

- **Exclusion of natural gas infrastructure from PCI eligibility** due to achieving an integrated and shock-resilient gas grid in Europe
- **Exclusion of oil pipelines from PCI eligibility**



Full alignment of infrastructure with the EGD

Instead of natural gas, focus on infrastructure needed for renewable and low carbon gases:

- New and repurposed **dedicated hydrogen networks**
- **Electrolysers** with a cross-border impact (above 100 MW)
- **Smart gas grid solutions** to integrate renewable and low-carbon gases (biogas, biomethane, and hydrogen) into existing gas grid

Projects of Mutual Interest (PMIs)

- Scope extended to projects connecting the EU with third countries (including possible hydrogen projects) given their expected increasing role in achieving the climate objectives.
- Conditions:
 - **Regulatory alignment** of the neighbouring country with the EU
 - Impact on at least **two Member States**
 - Mutual benefit, including through contribution to **EU decarbonisation goals**

Access to funding from the Connecting Europe Facility (CEF)

- Chapter VII updates the eligibility of projects for Union financial assistance for the new infrastructure categories.
- In principle, PCIs have access to CEF funding for both studies and works
- But the following are not eligible for grants for works: electrolysers, hydro-pumped storage
- While PMIs will be eligible for Union financial assistance, only the investments located on the territory of the Union will be eligible for CEF assistance in the form of grants for works under specific conditions.



Thank you

[https://ec.europa.eu/energy/topics/
infrastructure_en](https://ec.europa.eu/energy/topics/infrastructure_en)