



EU energy policy perspective

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**CERRE EXECUTIVE SEMINAR
RENEWABLE GASES AND HYDROGEN
FROM ECONOMIC POTENTIAL TO SMART REGULATION**

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EU main Energy policy developments

Energy Union: a secure, sustainable, competitive, affordable energy for every European

5 guiding dimensions:

- Energy security, solidarity and trust
- A fully integrated internal energy market
- "Energy efficiency first" (including the transport sector)
- Transition to a long-lasting low-carbon society
- An Energy Union for Research, Innovation and Competitiveness

The Clean Energy for All Europeans (CE4AE) package:

- All the legislative acts are now in place: EPBD, EED, RED II, Governance Regulation, Electricity Market Directive and Regulation, Risk Preparedness Regulation and ACER Regulation.

The Strategy for long-term EU GHG emissions reductions:

- On 28 November 2018 the EC presented its vision to achieve climate neutrality by 2050, through a fair transition encompassing all sectors of the economy.

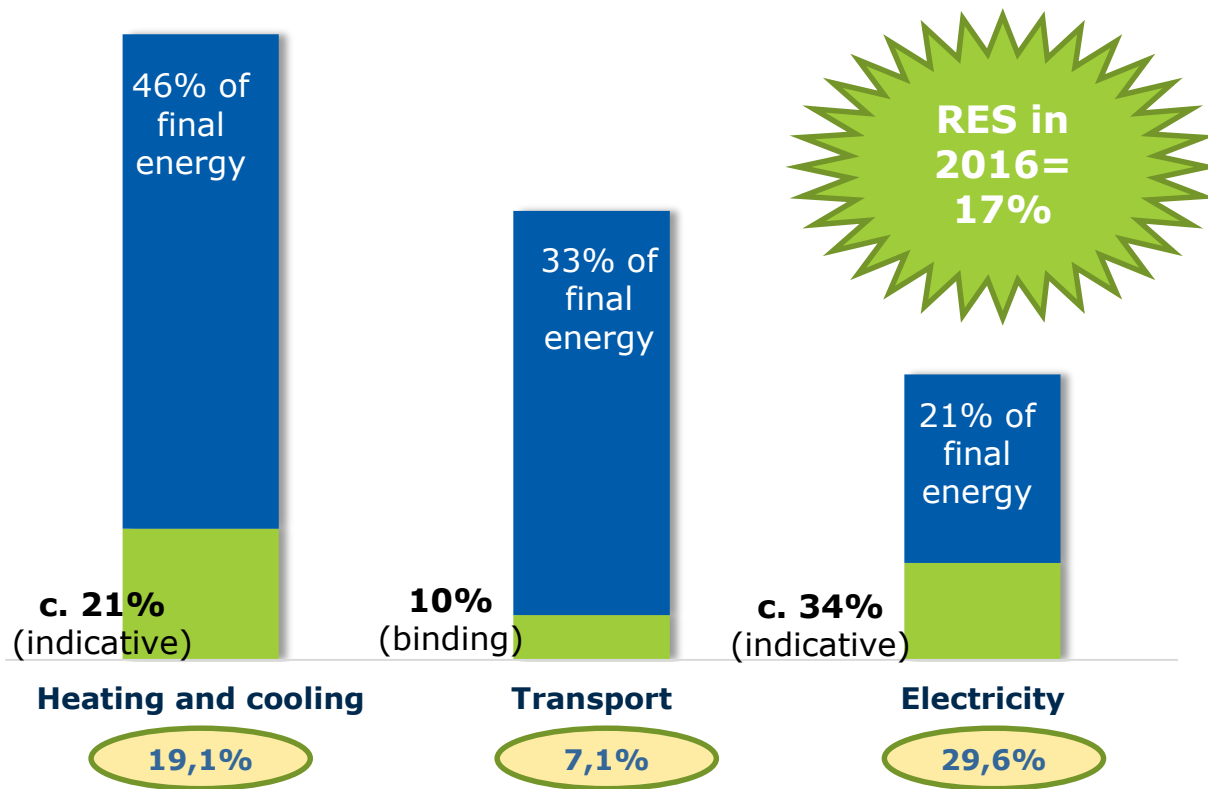
Renewables in the EU – progress per sector towards 2020

Share of final energy (2016, rounded figures)

RES target 2020

Energy service

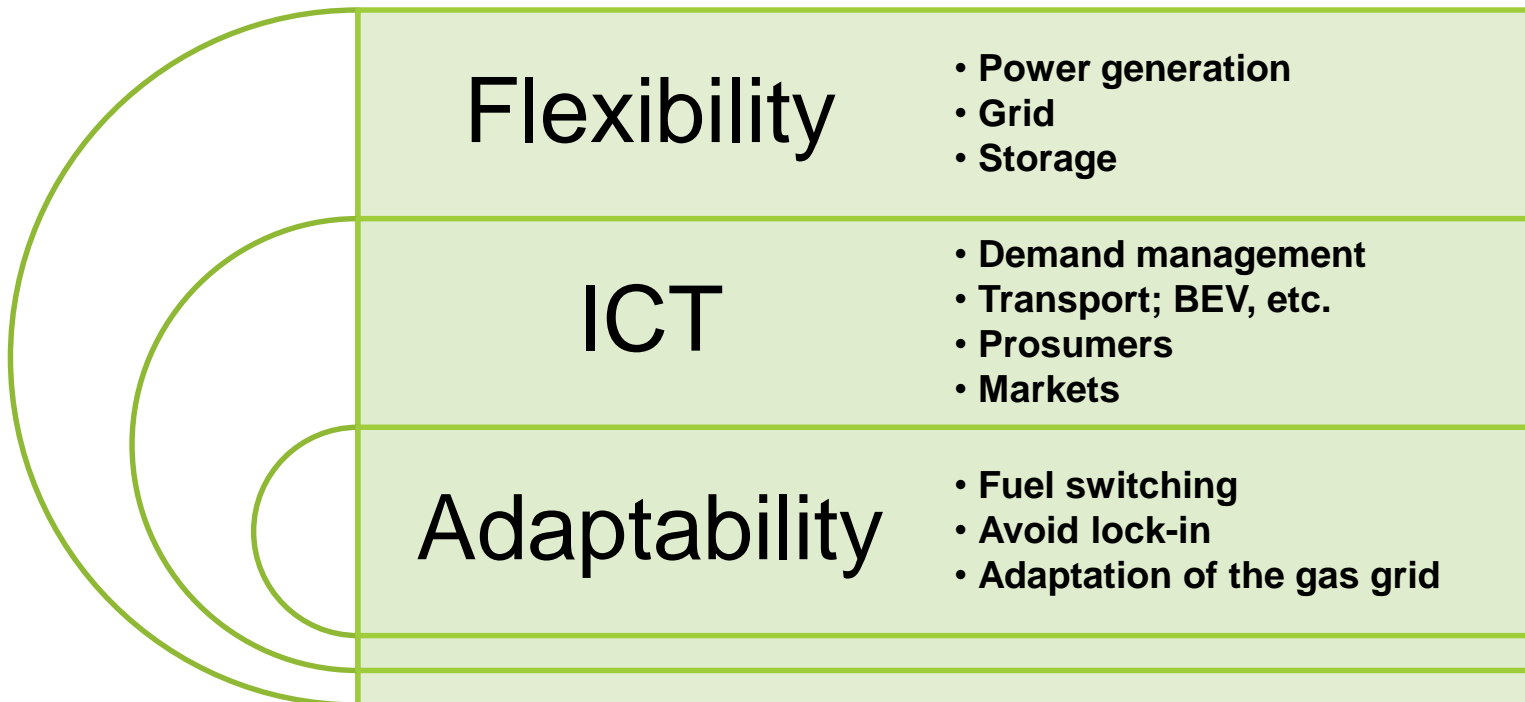
Share 2016 (Eurostat)



A flexible and adaptive energy system

Smart Energy System

- Generation
- Demand
- Electricity, gas and heat networks
- Storage



Sectoral Integration at EU level – ASSET study

Assuming the following hydrogen uses:

- Mix up to 15% in gas distribution
- Use fuel cells using H₂ in vehicles that cannot run in batteries, such as trucks, buses, taxis, duty vehicles. Combine with large-scale HRS, which may include electrolysis and H₂ storage
- Use H₂ directly in high temperature furnaces in industry combined with local electrolysis and storage
- Produce clean methane in methanation plants using CO₂ captured from air, integrated in power utility facilities well interconnected. H₂ produced in these locations also serve electricity storage
- $\frac{3}{4}$ of total directly used in final consumption and $\frac{1}{4}$ of total as a feedstock to produce clean methane (CH₄)

RESULTS

- ✓ **96% CO₂ emissions reduction** in 2050 (relative to 1990) against -84% CO₂ in the basic decarbonisation scenario
- ✓ The balanced scenario abates CO₂ at an **average cost of €88/t CO₂** (cumulatively in the period 2030-2050) against €182/tCO₂ abated in the basic decarbonisation scenario

RED revision

- **32%** EU binding target for 2030
- Empower consumers, including energy communities, and self-consumption
 - Right to **self-consume and store energy**
 - **Non-discriminatory grid fees and charges**
- More targeted **non-distortive market** support
 - Coherence in support schemes across EU
- Revised **renewable** targets in **transport**
 - Focus on advanced biofuels & fuels from **non-biological origin**

RED revision – provisions relevant to H₂ and storage

- Art. 19 on **Guarantees of Origin**
- Art. 20(1): *Where relevant, Member States shall assess the need to extend existing **gas network infrastructure** to facilitate the integration of gas from renewable sources.*
- Art. 24(8): **Thermal storage:** DSOs and DH operators to assess at least every 4 years the potential of thermal storage (district heating/cooling) to assess if more resource- and cost-efficient than alternative solutions
- Art. 25(2): *The GHG emissions savings from the use of **renewable liquid and gaseous transport fuels of non- biological origin** shall be at least 70 % from 1 January 2021.*
- Art. 27(3) on **electricity used to produce RFNBO**
- Art. 28(5) *By 31/12/2021, the EC shall adopt **delegated acts** [...] specifying the methodology for assessing **greenhouse gas emissions savings from renewable liquid and gaseous transport fuels of non- biological origin** [...].*

Energy storage in the electricity system

- Energy storage services should be a **market-based activity** and developed under competitive terms.
- **Efficient use of storage facilities** and **fair access** to storage services for all market participants.
- **Avoid distortion of competition** and cross-subsidization between storage and distribution/transmission of electricity.
- The new Electricity Directive and Regulation under the CEP, put in place a new framework for energy storage in the electricity system:
 - **Energy storage definition** which accommodates the different storage technologies
 - **Specific role** of network operators
 - Participation of energy storage in the market and provision of **flexibility services** at a level playing field with other energy resources

Long-term decarbonisation strategy (1)

Scenarios for Europe in 2050

- Scenarios are used for projection about demand and supply of energy (including land use) → compliant with Paris targets
- 8 scenarios analyse different technology pathways (high electrification, high energy efficiency, circular economy, etc.)
- Different levels of ambition: -80% emissions and net-zero by 2050 plus a Baseline (business as usual)

Long-term decarbonisation strategy (2)

Analysed scenarios in line with Paris Agreement

Long Term Strategy Options

	Electrification (ELEC)	Hydrogen (H2)	Power-to-X (P2X)	Energy Efficiency (EE)	Circular Economy (CIRC)	Combination (COMBO)	1.5°C Technical (1.5TECH)	1.5°C Sustainable Lifestyles (1.5LIFE)
Main Drivers	Electrification in all sectors	Hydrogen in industry, transport and buildings	E-fuels in industry, transport and buildings	Pursuing deep energy efficiency in all sectors	Increased resource and material efficiency	Cost-efficient combination of options from 2°C scenarios	Based on COMBO with more BECCS, CCS	Based on COMBO and CIRC with lifestyle changes
GHG target in 2050	-80% GHG (excluding sinks) [“well below 2°C” ambition]					-90% GHG (incl. sinks)	-100% GHG (incl. sinks) [“1.5°C” ambition]	
Major Common Assumptions	<div><div><ul style="list-style-type: none">Higher energy efficiency post 2030Deployment of sustainable, advanced biofuelsModerate circular economy measuresDigitilisation</div><div><ul style="list-style-type: none">Market coordination for infrastructure deploymentBECCS present only post-2050 in 2°C scenariosSignificant learning by doing for low carbon technologiesSignificant improvements in the efficiency of the transport system.</div></div>							
Power sector	Power is nearly decarbonised by 2050. Strong penetration of RES facilitated by system optimization (demand-side response, storage, interconnections, role of prosumers). Nuclear still plays a role in the power sector and CCS deployment faces limitations.							
Industry	Electrification of processes	Use of H2 in targeted applications	Use of e-gas in targeted applications	Reducing energy demand via Energy Efficiency	Higher recycling rates, material substitution, circular measures	Combination of most Cost-efficient options from “well below 2°C” scenarios with targeted application (excluding CIRC)	COMBO but stronger	CIRC+COMBO but stronger
Buildings	Increased deployment of heat pumps	Deployment of H2 for heating	Deployment of e-gas for heating	Increased renovation rates and depth	Sustainable buildings			CIRC+COMBO but stronger
Transport sector	Faster electrification for all transport modes	H2 deployment for HDVs and some for LDVs	E-fuels deployment for all modes	<div><div>• Increased modal shift</div><div>• Electrification as in ELEC</div></div>	Mobility as a service			<div><div>• CIRC+COMBO but stronger</div><div>• Alternatives to air travel</div></div>
Other Drivers		H2 in gas distribution grid	E-gas in gas distribution grid				Limited enhancement natural sink	<div><div>• Dietary changes</div><div>• Enhancement natural sink</div></div>

The Hydrogen Initiative

- Launched by the Austrian Presidency
- Signed by 26 MS + CH, IS and the EC
- Signed by 100 private stakeholders
- Puts emphasis on:
 - **the usage of hydrogen for seasonal storage of electricity**
 - **the potential of renewable hydrogen for climate transition**
 - **the versatile use of hydrogen (decarbonisation of industry and greening the gas network)**

The Sustainable and Smart Gas Infrastructure declaration

- Launched by the Romanian Presidency
- Signed by 17 MS + Switzerland, Norway and Liechtenstein
- Aims to maximise the potential of the gas grid to accommodate growing shares of near-zero carbon hydrogen and renewable gases
- Concerns existing as well as planned infrastructure, in order to avoid stranded assets
- Calls on signatories to estimate the potential shares of hydrogen and renewable gases to support future decarbonised energy systems

Thank You for Your Attention!

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http://ec.europa.eu/energy/index_en.htm

