

European energy policies supporting energy transitions

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Energy



The way towards: The Energy Union

Where we want to go:

A secure, sustainable, competitive, affordable energy for every European

What this means:

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 Competiveness

How we want to reach it:



Source: Directorate-General for Energy



Fuel Ranges (primary energy consumption)





Renewables in the EU – progress per sector



Energy

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A flexible and adaptive energy system

Smart and Efficient Energy System

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



Power generation Grid Storage Demand management Transport; BEV, etc. Prosumers Markets Fuel switching Avoid lock-in Adaptation of the gas grid



First study on Sectoral Integration at EU level - ASSET - preliminary evaluations (1)-

Hydrogen roadmap to 2050: Technological and market developments

- Linking the power and mobility sector & Usage of H2 in transportation
- Linking the power sector and H2demanding industry
- Linking the power sector with transport and heating sectors
- Energy storage, integration of RES and sectorial integration
- Analysis by country

Modelling the impact of sectoral integration

- We analyse the following three scenarios:
 - H2 as a carrier
 - H2 as feedstock
 - H2 for power storage
 - and a
 - Balanced realistic scenario
 - The new assumptions add to a basic decarbonisation scenario (EUCO)

PRIMES modeling

- Full projections for each EU MS up to 2050
- Impacts on the EU energy system including costs and infrastructure investment
- Modeling market equilibrium with complete integration of demand and supply
- Explicit policy and technological drivers



A combined – realistic scenario towards zero emissions

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 H2 refueling stations, 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.

Rest of Options

- Fully decarbonize power generation using **maximum contribution by RES**, dispersed and centralized, complemented by nuclear and CCS where possible. Direct storage and chemical storage, as well as interconnections, succeed to balance the RES.
- Develop advanced sustainable biomass feedstock to produce fungible jet fuels and ship fuel, as well as bio-methane mixed in the gas grid
- Exploit to maximum possible potential **energy efficiency** in buildings and industry
- Electrify car mobility and heating

asset



First study on Sectoral Integration at EU level - preliminary evaluations (3)-

Emissions and costs in the Balanced Scenario







96% CO2 emissions reduction in 2050 (relative to 1990)

- 12 percentage points more than in the >> basic decarbonisation scenario (-84% CO2 in 2050)
- The balanced scenario abates CO2 at an average cost of €88/t CO2 (cumulatively in the period 2030-2050)
 - Which is less than half of the cost in >> the basic decarbonisation scenario (€182/tCO2 abated)
- The performance owes to the multiple roles of hydrogen in sectoral integration, and its particular role in the transport 8 sector



Energy priorities for Sustainable Future Energy Systems

- » Key role for innovation: H2020 SET Plan, FCH JU, Informatics and data exchange
- Reinforce the policy framework, (Clean Energy package incl. EE, RES, distributed generation (RE), flexibility and storage, smart technologies, capacity markets, tariff structures, certification etc.)
- Integrating solutions for smart electricity, gas and heat networks operation
- » Integrating solutions for power, transport and industrial sector
- Standardisation infrastructure, equipment and gas quality (incl. Hydrogen and bio-methane)
- » International cooperation
- » Financing energy transitions



Thank You for Your Attention!

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

