EU energy policy supporting sectoral integration

Dr. Tudor Constantinescu
Principal Adviser, European Commission – DG Energy

GEODE Spring Seminar

A Whole System Approach
DSOs after the Clean Energy Package

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Energy

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

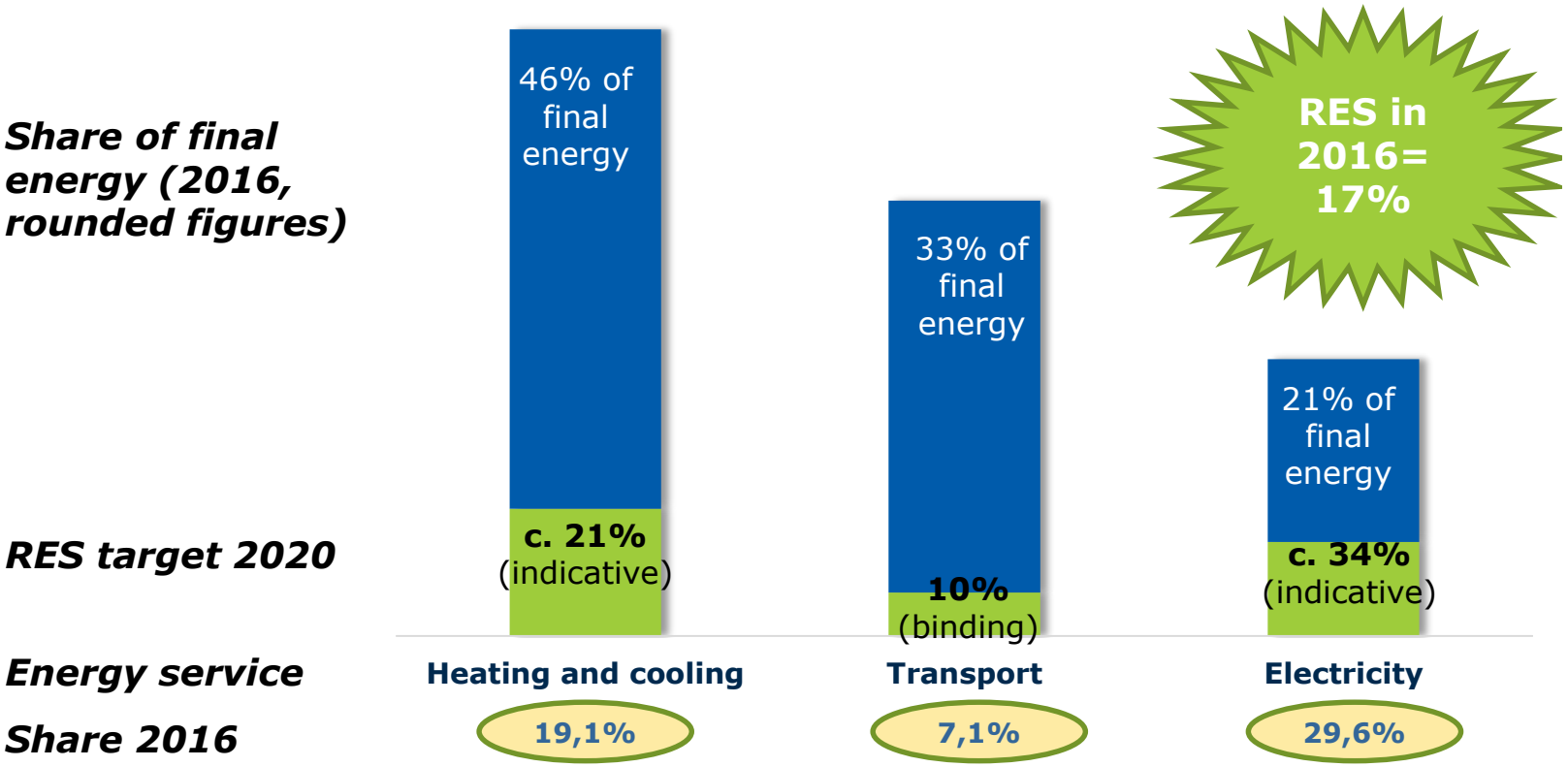
The Clean Energy for All Europeans (CE4AE) package:

- On 30 November 2016, the EC presented a new package of measures to facilitate the clean energy transition.
- 4 of the 8 legislative acts in the CE4AE package are now in place (EPBD, EED, RED II, Governance). Political agreement has also been reached on Electricity Directive, Electricity Regulation, Risk Preparedness and ACER.

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



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 H_2 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** […]*.

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
- ¾ of total directly used in final consumption and ¼ 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

Long-term decarbonisation strategy (1/2)

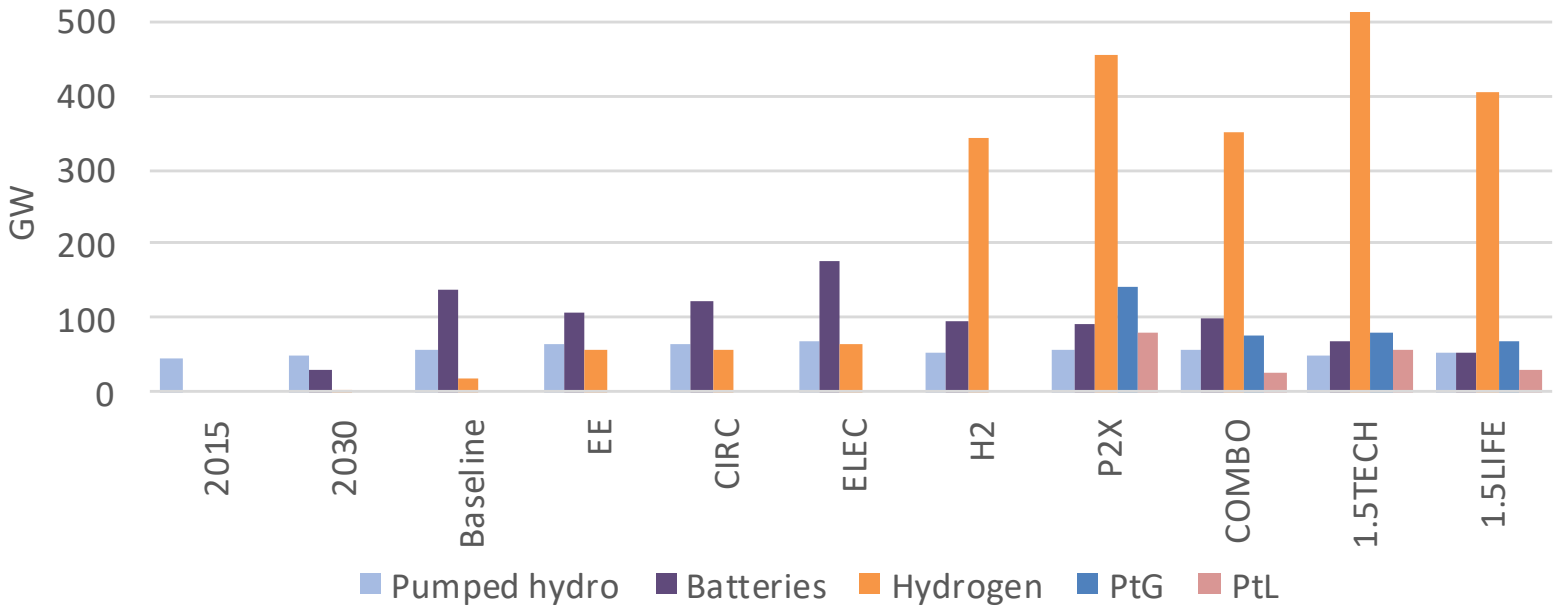
Analysed scenarios in line with Paris Agreement

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	• Higher energy efficiency post 2030 • Deployment of sustainable, advanced biofuels • Moderate circular economy measures • Digitilisation				• Market coordination for infrastructure deployment • BECCS present only post-2050 in 2°C scenarios • Significant learning by doing for low carbon technologies • Significant improvements in the efficiency of the transport system.			
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	• Increased modal shift • Electrification as in ELEC	Mobility as a service			• CIRC+COMBO but stronger • Alternatives to air travel
Other Drivers		H2 in gas distribution grid	E-gas in gas distribution grid				Limited enhancement natural sink	• Dietary changes • Enhancement natural sink

Long-term decarbonisation strategy (2/2)

Storage capacity in 2050



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

The Hydrogen Energy Network

- DG ENER set up an **informal network of experts** from Ministries in charge of Energy.
- Aim: offer to Member States a **platform to exchange information and best practices** to help them advance in a coherent manner on developing hydrogen solutions for the energy sector, discussing
  - Paths and solutions for hydrogen as a **decarbonised energy carrier**.
  - Hydrogen use for **large-scale energy storage** and for **sector integration/coupling**.
  - **Opportunities offered by the results of the research activities** undertaken by Member States, industry and the Commission.

A whole system approach
Regulatory and policy topics - electricity and gas

- Key role for **innovation**: H2020, FCH JU, Informatics and data exchange
- Reinforce the **policy framework**, (Clean Energy Package - incl. RES, distributed generation (RE), storage, smart technologies, capacity markets etc.)
- Important role for **balancing and** for **demand side flexibility**.
- Energy prices and network **tariff structures** which could integrate the increasing variability of power generation and secure investments.
- **Certification** (=market) for low-carbon gas (P2G), linking to the electricity market.
- Mechanisms for **linking energy storage to other economic sectors** (transport, industry).
- **Standardisation** - infrastructure, equipment and gas quality (incl. Hydrogen and bio-methane)
- International collaboration and financing

European Commission

Thank You for Your Attention!

tudor.constantinescu@ec.europa.eu

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