Ifri Centre for Energy

The EU Energy Transition: Progress, Perspectives and Global Implications

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The EU’s emissions have been on a decreasing trend since 1990, but progress stalled in 2017.

**KEY FACTORS BEHIND THE 1.8% INCREASE IN 2017**

- Economic growth rebound: +2.4%
- Price effect: relatively low fossil fuel prices disentivizing energy efficiency and efforts in reducing transport demand

**Change in energy-related CO₂ emissions from the EU28 between 1990 and 2017 (kton CO₂)**

**Change in energy-related CO₂ emissions by selected countries in 2017**

Political push to strengthen the EU’s 2030 targets, in light of the Paris Agreement

WILL THE EU COMMIT TO BEYOND -40% GHG EMISSIONS REDUCTION BY 2030?
• Talanoa Dialogue and COP24: EU expected to show higher ambition
• New EE & REN targets lead to higher progress in terms of GHG emissions reduction
• Internal obstacles: EU losing the UK pro-climate advocate, reluctance to re-open effort sharing decision (result of 8 years of negotiations)
Renewables become cost-competitive, but grid expansions remain a significant issue

Results of the latest offshore wind tenders in Europe

Share of renewables in final energy consumption in 2016

GRID REINFORCEMENTS IN EU TYNDP 2018:

- 166 transmission projects proposed
- Totaling €114bn investment by 2030

Source: Michel Cruciani, Note de Ifri, 07.18
Despite renewable expansion, the emission intensity of the EU power sector is almost stable

**Share of renewables in total electricity production (2007-2016) in %**

- EU28
- FR
- DE
- PL
- UK

**Emission intensity of the power sector (2007-2016), CO2gr/kWh**

- EU28
- FR
- DE
- PL
- UK

*Source: European Commission*
The slow decline of coal in the EU

**The EU power generation mix (2010-2017)**

- **Stagnating demand**: -0.5% in 2017
- **Since peaking year (2012)**, coal-based power gen. decreased by only 6.7 percentage points
- **Key issue is Germany**: stay at > 40%

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**Germany’s power generation mix (2010-2017)**

Source: Ifri based on Euracoal, Eurostat and estimates by Sylvie Cornot Gandolphe, Coal Exit or Expansion, Note de l’Ifri, April 2018

Source: Ifri, German Ministry of Economy BMWI
Will the EU ETS finally doing its job in cutting emissions?

KEY FACTORS

• Anticipation of the MSR kick off in January, reducing the volume of auctioned quotas by 44% in 2019

• Industrial growth rebound: industrial emissions up 1.9% in 2017

• Speculative behaviors and high volatility

Yet, limited possibilities for coal-to-gas switching: bullish European gas prices due to higher oil prices and tight LNG markets

EU ETS settlement prices, May-17 to Sept-18 (€/tCO₂)

Source: European Energy Exchange, Market Data, 06.09.18
The transport sector is the “next frontier” of the EU low-carbon transition

- EU oil demand increased by 2% in 2017, the highest rate of growth since 2001

Source: Eurostat

Source: European Commission
What options for an EU low-carbon road transport system?

POTENTIAL LIMITS TO MASSIVE ELECTRIFICATION

- Environmental footprint depends on the **electricity mix** and the **recycling** rates
- **Access to raw materials** could be problematic (e.g. cobalt)
- Availability of fast-charging station and impact on peak-time electricity demand
- **Industrial value creation**: very few EU players involved in EV battery cells manufacturing

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**EV sales in the EU (2010-2017)**

Source: European Environment Agency
The battle for EV battery cell production in Europe: few EU contenders vs. powerful Asian incumbents

**NORTHVOLT**
- Announced in spring 2017, construction to start in Q2 2018
- Demo line ready mid-2019 with 8GWh/yr capacity
- 32GWh/yr production target for 2023/2024
- Investors: InoEnergie, Stena, Vattenfall, Vinnova
- Grant from the Swedish Energy Agency: €15 million
- EIB loan: €52.2 million

**CATL**
- Announced in Summer 2018, construction to start in 2019
- 14GWh/yr production target for 2022
- Contracts with BMW, Daimler & Volkswagen

**LG Chem Wroclaw factory**
- Announced in 2016
- Start of operation in Q4 2018
- 100,000 EV batteries (4GWh/yr) production target
- €310 million to be invested up to 2020

**Samsung SDI Géod factory**
- Announced in 2016
- Start of operation in Q2 2018
- 50,000 EV batteries (2GWh/yr) production target
- €300 million investment

**SK Innovation Komárom factory**
- Plans to break ground in February 2018
- Start of production in early 2020
- 7.5 GWh/yr production target
- €620 million to be invested

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Battery alliance between Saft, Solvay, Siemens and Manz
- Focusing on high density li-ion solid state batteries for 2025

Source: Carole Mathieu, "The EU Battery Alliance: Can Europe Avoid Technological Dependence?", Éditions d’Energie, IFRI, February 2018.
Key challenges for a net-zero emission strategy by 2050

- How to ensure consistency between national energy policies?
- What carbon pricing instruments: domestically and internationally?
- How to achieve a “Just transition”?
- What flexibility options to ensure the large scale integration of REN?
- How to encourage investment in breakthrough technologies?
- Clean Mobility: all electric or a mix of options?
- Geopolitical dimension: how to ensure access to critical raw materials and control over key technologies?
France: leader in low carbon power generation, but must do more to reach national targets

Expected decision to bring down share of nuclear power from 77% to 50% around 2035

- Extend operational life-time of some reactors while closing others?
- Avoid increasing CO₂ emissions:
  - manage the closure of two coal-fired power plants by 2022 (2.9GW)
  - Accelerate REN deployment to reach 32% of final energy consumption in 2030 (16% in 2018 / 2020 target: 23%)
- Discussions over opportunity / challenges of building new EPR

More energy efficiency efforts needed by 2030: reduce final consumption by 20% compared to 2012 (+0.9% in 2017)

Encourage green gas development (10% of demand by 2030) and move towards decarbonization of transport sector: support to EVs, diesel ban, higher taxes, hydrogen
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