Ifri Centre for Energy

The EU Energy Transition:
Progress, Perspectives and Global Implications

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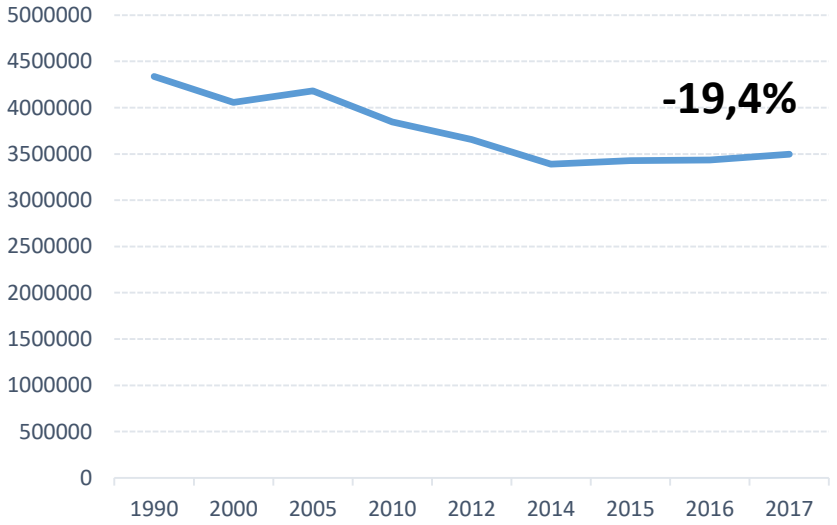
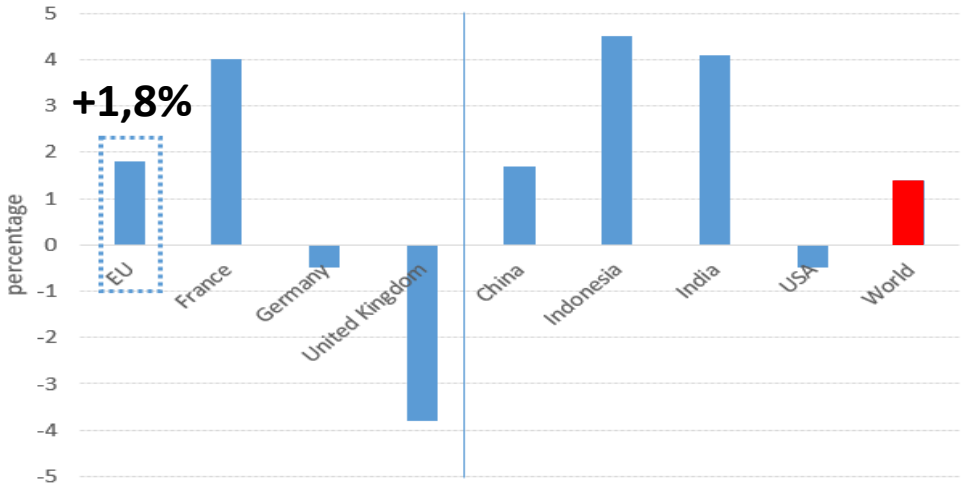
The EU's emissions have been on a decreasing trend since 1990, but progress stalled in 2017

Change in energy-related CO_2 emissions from the EU28 between 1990 and 2017 (kton CO_2)



Source: Eurostat

Change in energy-related CO_2 emissions by selected countries in 2017



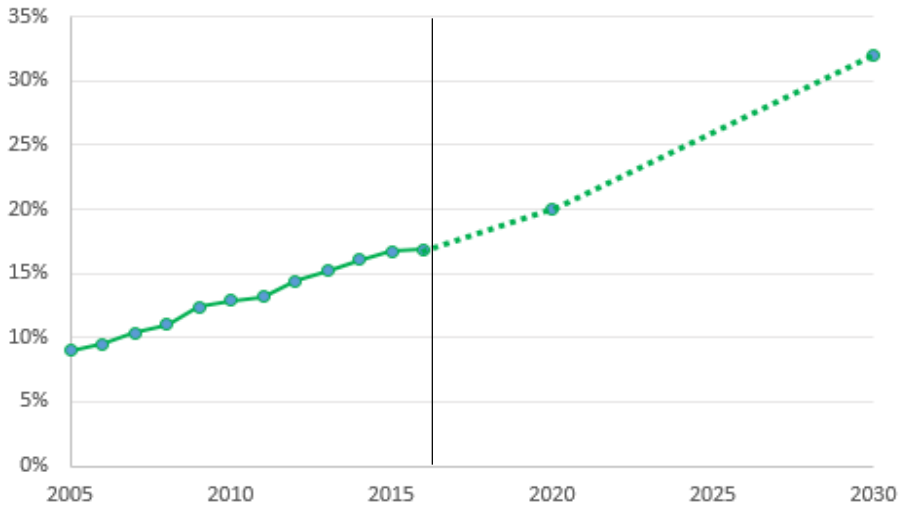
Source: Eurostat, IEA, Global Energy & CO2 Status Report 2017, Umweltbundesamt, BP

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

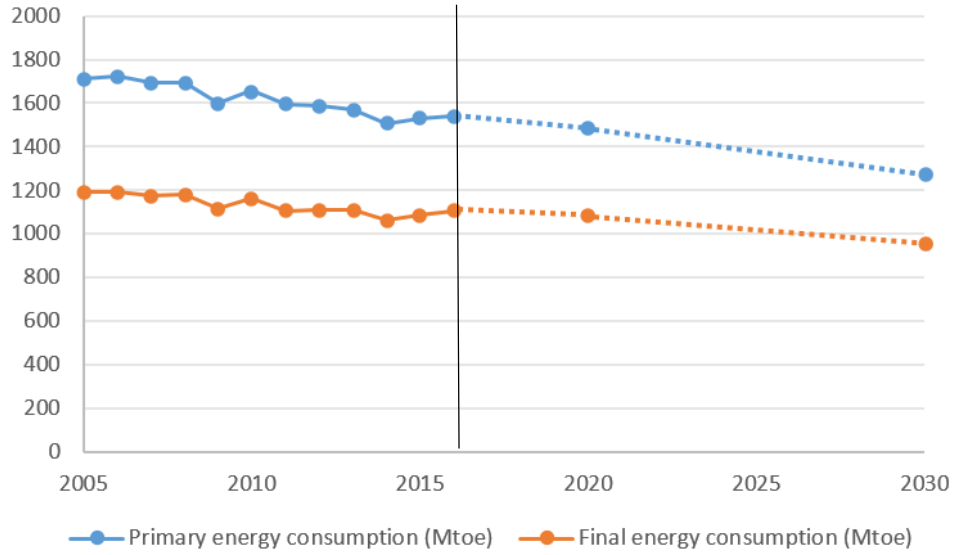
Political push to strengthen the EU's 2030 targets, in light of the Paris Agreement

Change in share of REN since 2005, and targets for 2020 and 2030



Source: European Environment Agency

Change in primary and final energy consumption since 2005, and targets for 2020 and 2030



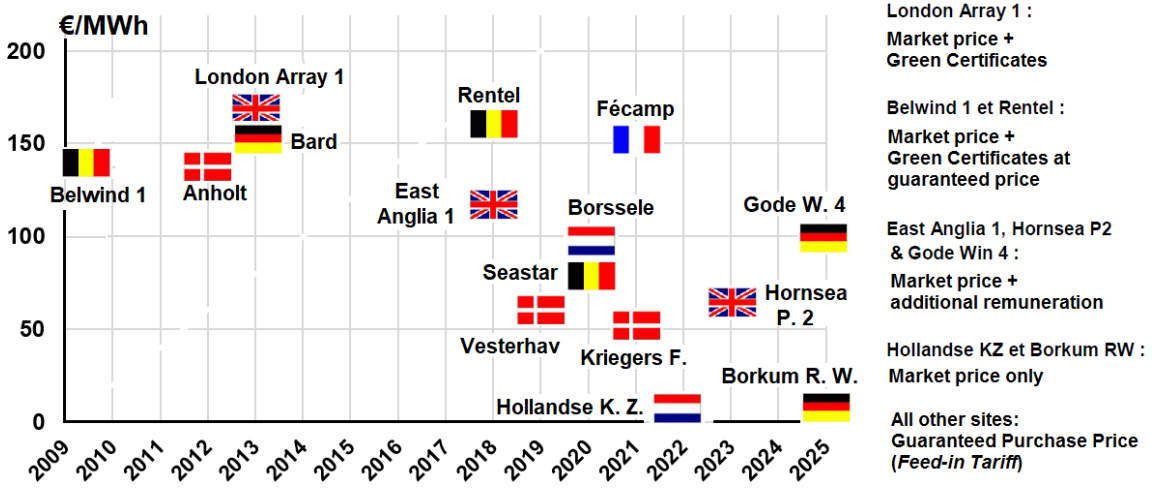
Source:European Environment Agency

WILL THE EU COMMIT TO BEYOND -40% GHG EMISSIONS REDUCTION BY 2030?

- Talanoa Diaologue 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 negociations)

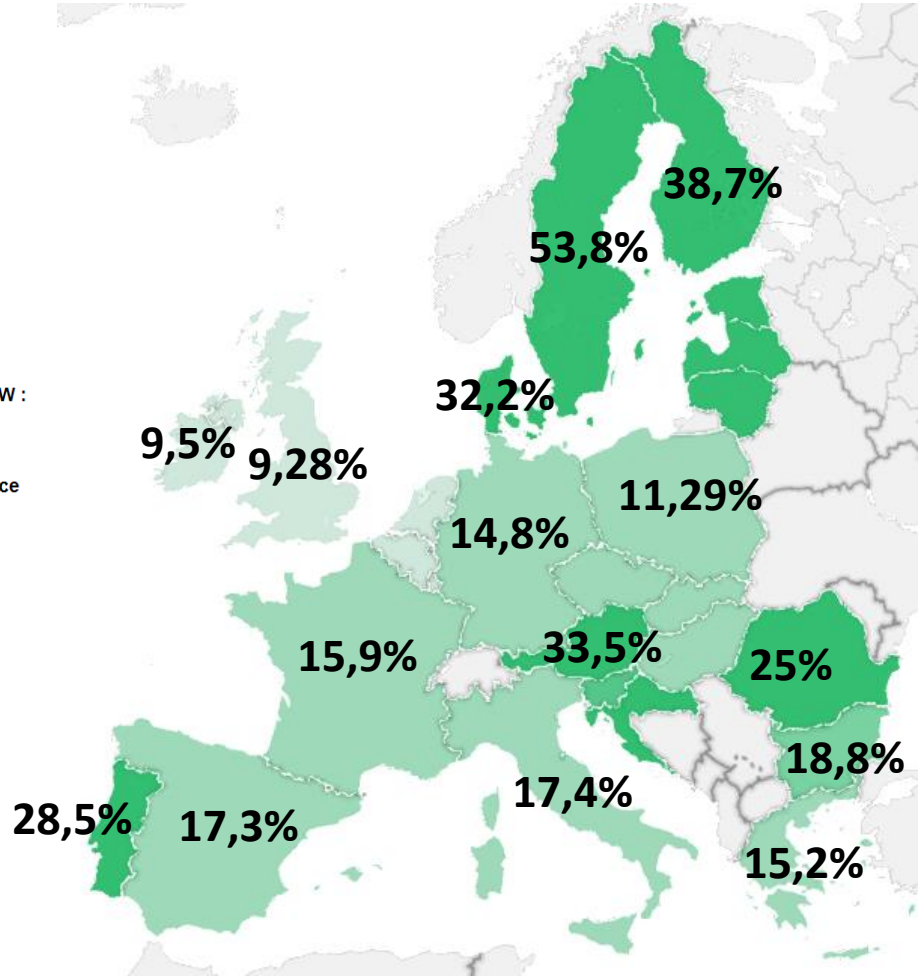
Renewables become cost-competitive, but grid expansions remain a significant issue

Results of the latest offshore wind tenders in Europe



Source: Michel Cruciani, Note de Ifri , 07.18

Share of renewables in final energy consumption in 2016



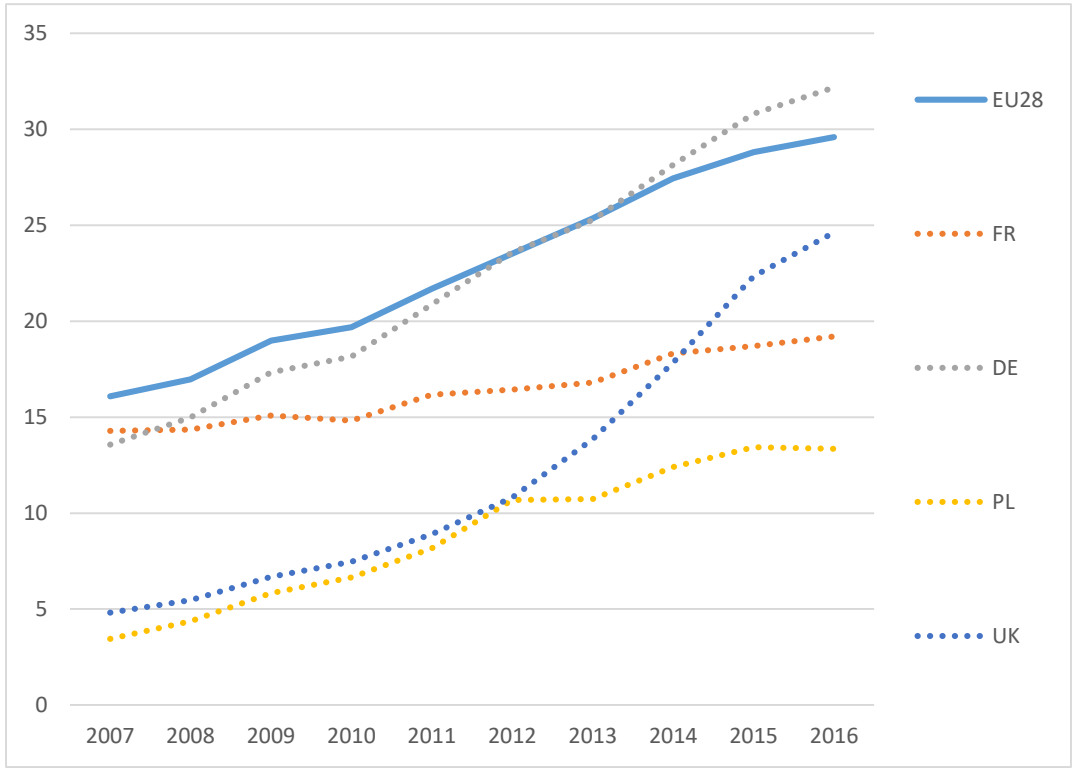
Source: European Commission, Energy Union Indicators Database

GRID REINFORCEMENTS IN EU TYNDP 2018:

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

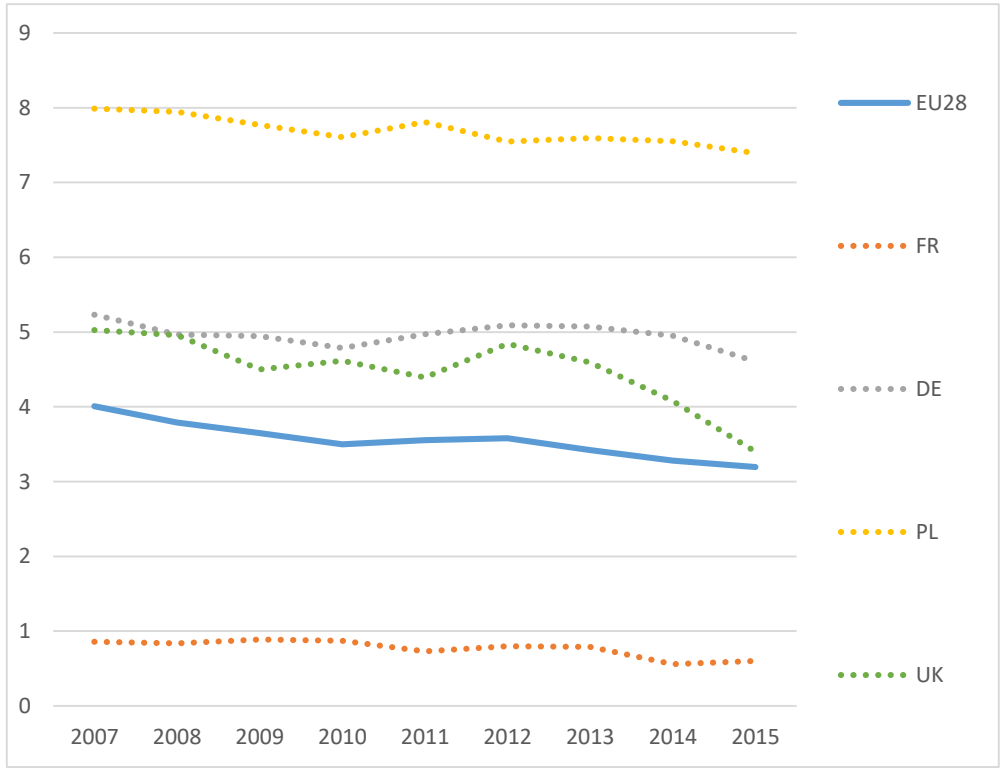
Despite renewable expansion, the emission intensity of the EU power sector is almost stable

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



Source: European Commission

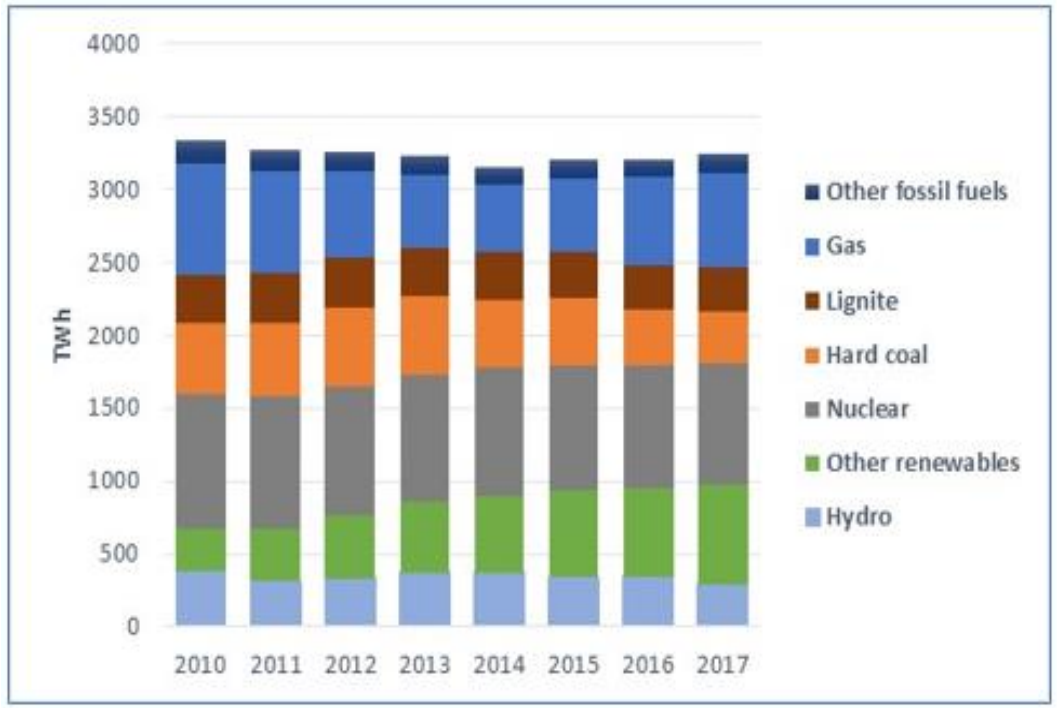
Emission intensity of the power sector (2007-2016), CO2gr/kWh



Source: European Commission

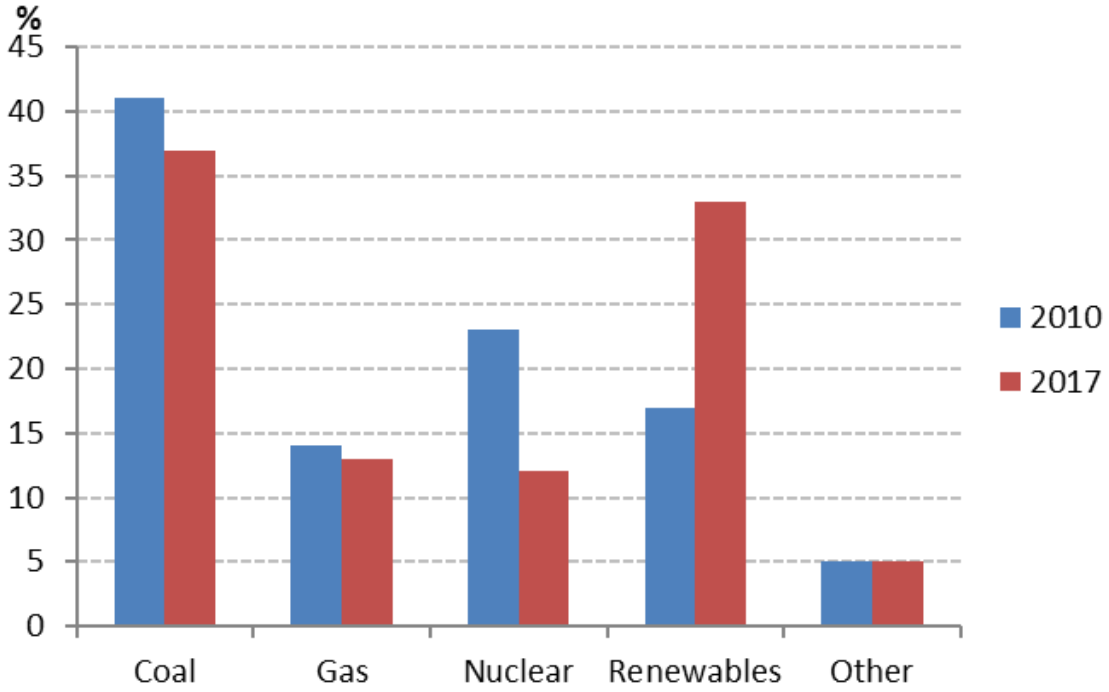
The slow decline of coal in the EU

The EU power generation mix (2010-2017)



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

Germany's power generation mix (2010-2017)



Source: Ifri, German Ministry of Economy BMWI

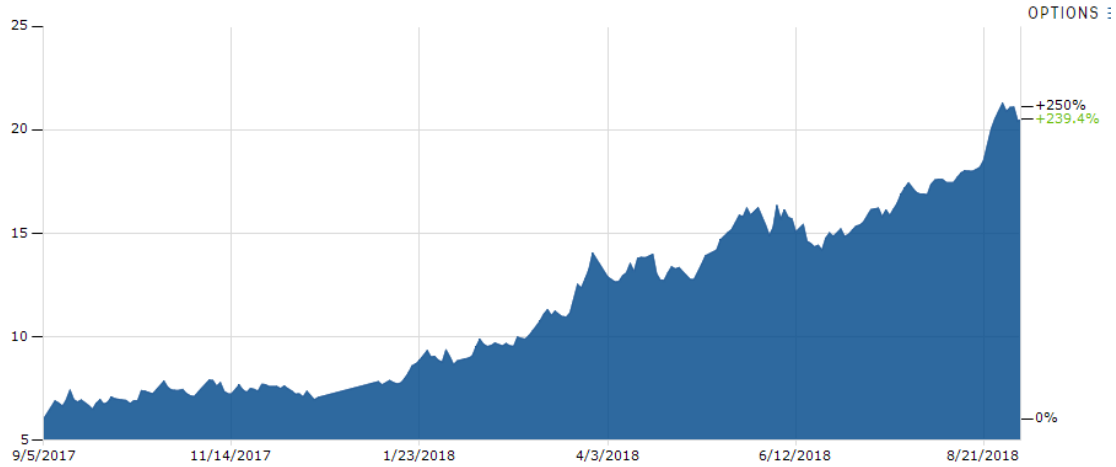
- Stagnating demand: -0,5% in 2017
- Since peaking year (2012), coal-based power gen. decreased by only 6,7 percentage points
- Key issue is Germany: stay at > 40%

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**

EU ETS settlement prices, May-17 to Sept-18 (€/tCO$_2$)

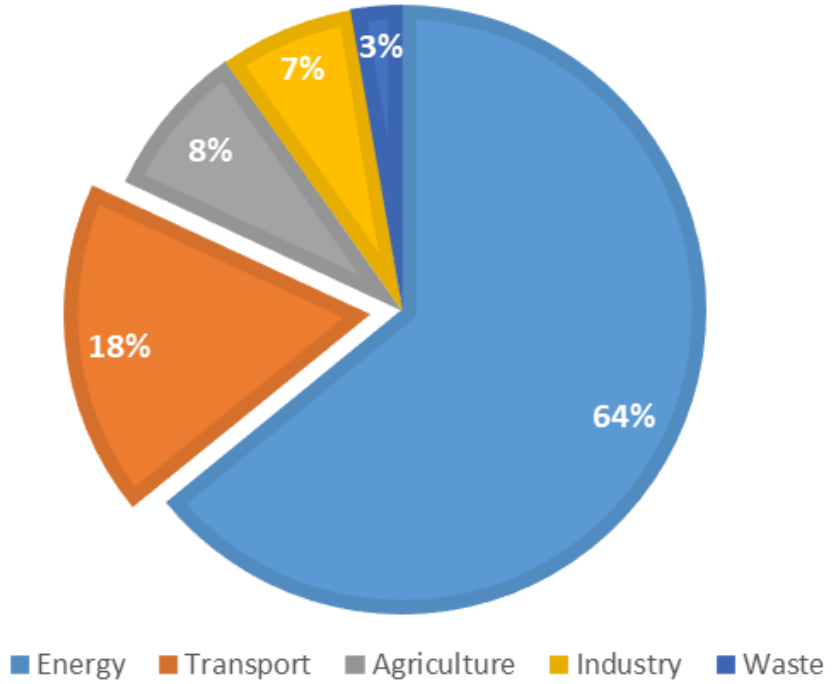


Source: European Energy Exchange, Market Data, 06.09.18

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

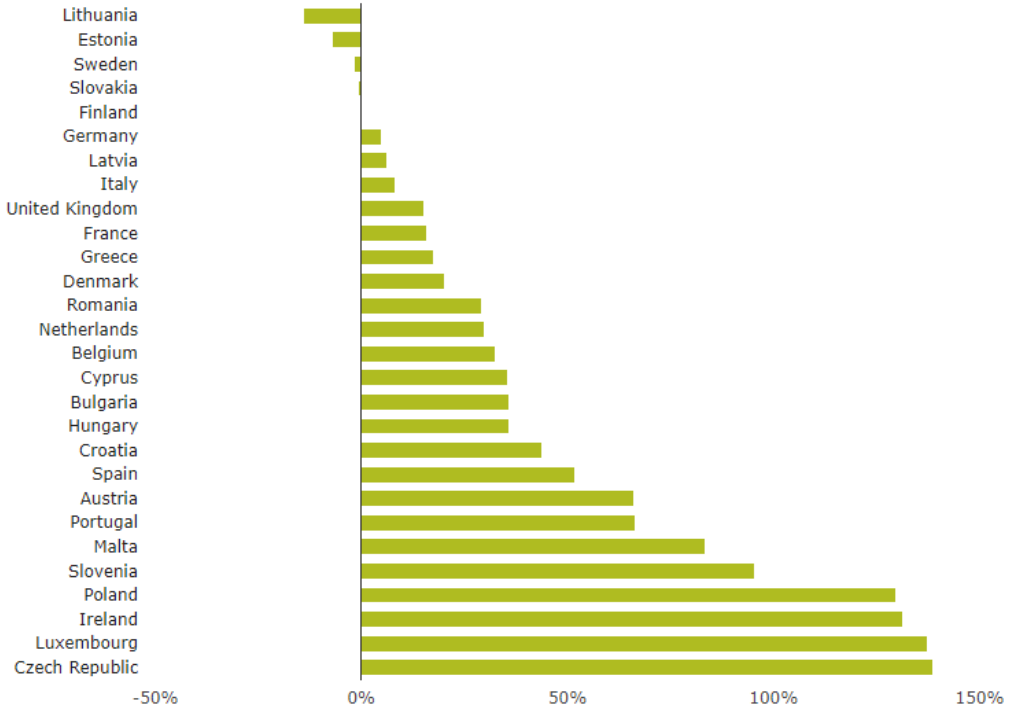
The transport sector is the “next frontier” of the EU low-carbon transition

EU GHG emissions by sector in 2016



Source: Eurostat

Change in total emissions from the transport sector (1990-2015)



Source: European Commission

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

What options for an EU low-carbon road transport system?

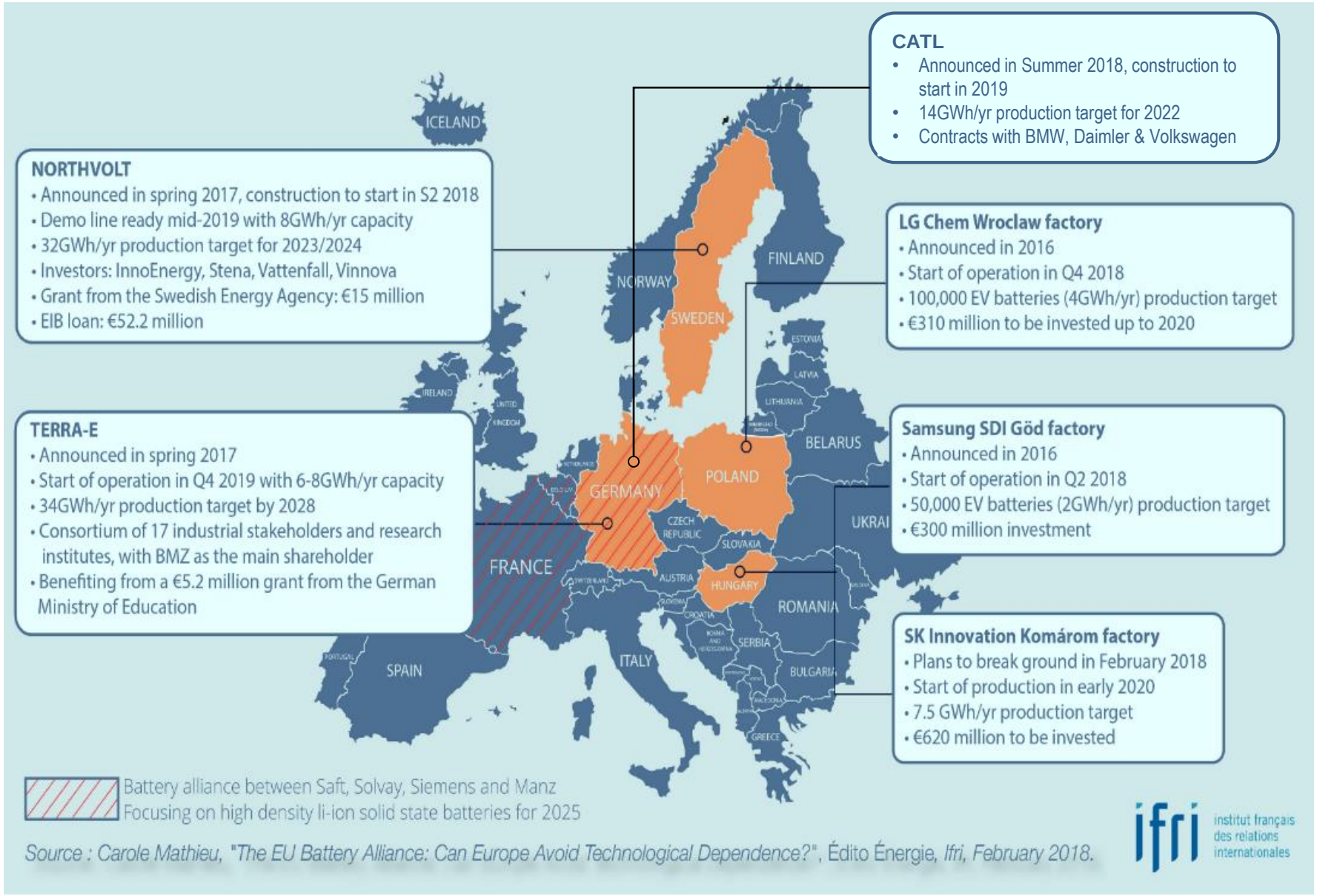
POTENTIAL LIMITS TO MASSIVE ELECTRIFICATION

- 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

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



Key challenges for a net-zero emission strategy by 2050

How to achieve a “Just transition”?

How to encourage investment in breakthrough technologies?

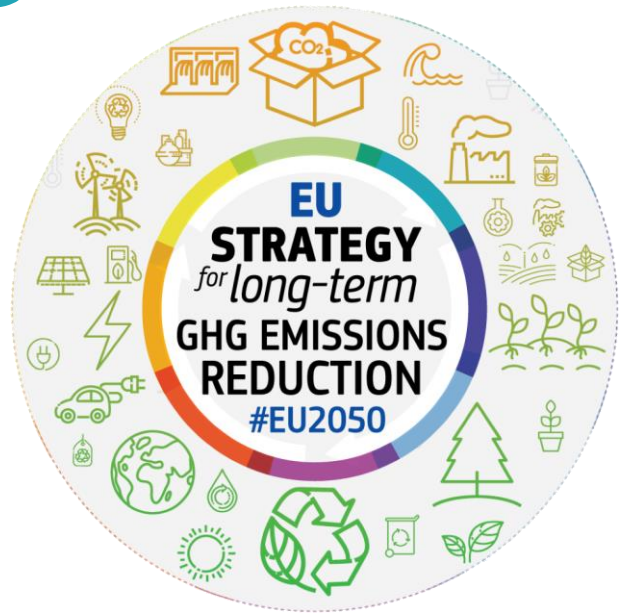
What flexibility options to ensure the large scale integration of REN?

Geopolitical dimension: how to ensure access to critical raw materials and control over key technologies?

Clean Mobility: all electric or a mix of options?

What carbon pricing instruments: domestically and internationally?

How to ensure consistency between national energy policies?

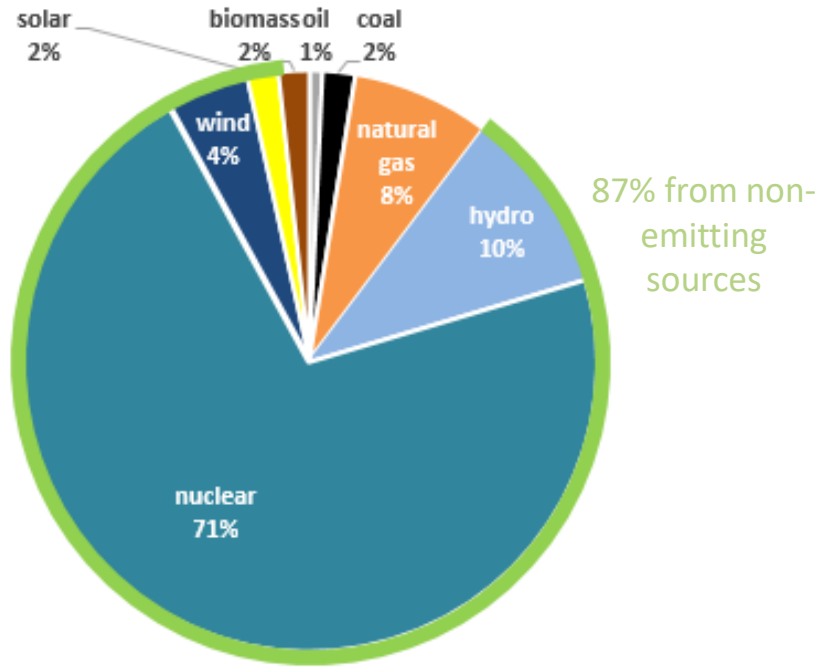


France: leader in low carbon power generation, but must do more to reach national targets

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 CO_2 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

Electricity production by source in France in 2017



Source: RTE

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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