Energy transition in the power sector in Europe: State of Affairs in 2017

Review of the Developments and Outlook for 2018

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Key Findings

1

New renewables generation sharp ly increased in 2017, with wind, solar and biomass overtaking coal for the first time. Since Europe‘s hydro potential is largely tapped, the increase in renewables comes from wind, solar and biomass generation. They rose by 12% in 2017 to 679 Terawatt hours, putting wind, solar and biomass above coal generation for the first time. This is incredible progress, considering just five years ago, coal generation was more than twice that of wind, solar and biomass.

Key Findings

2

But renewables growth has become even more uneven. Germany and the UK alone contributed to 56% of the growth in renewables in the past three years. There is also a bias in favor of wind: a massive 19% increase in wind generation took place in 2017, due to good wind conditions and huge investment into wind plants. This is good news since the biomass boom is now over, but bad news in that solar was responsible for just 14% of the renewables growth in 2014 to 2017.

Key Findings

3

Electricity consumption rose by 0.7% in 2017, marking a third consecutive year of increases. With Europe‘s economy being on a growth path again, power demand is rising as well. This suggests Europe‘s efficiency efforts are not sufficient and hence the EU‘s efficiency policy needs further strengthening.

Key Findings

4

Greenhouse gas emissions in Europe are increasing again – but nevertheless the EU ETS surplus rose slightly. Low hydro and nuclear generation coupled with increasing demand led to increasing fossil generation. We estimate power sector CO2 emissions remained unchanged at 1019 million tonnes, and overall stationary emissions in the EU emissions trading sectors rose slightly from 1750 to 1755 million tonnes.Together with additional increases in non-ETS gas and oil demand, we estimate overall EU greenhouse gas emissions rose by around 1 percent in 2017.

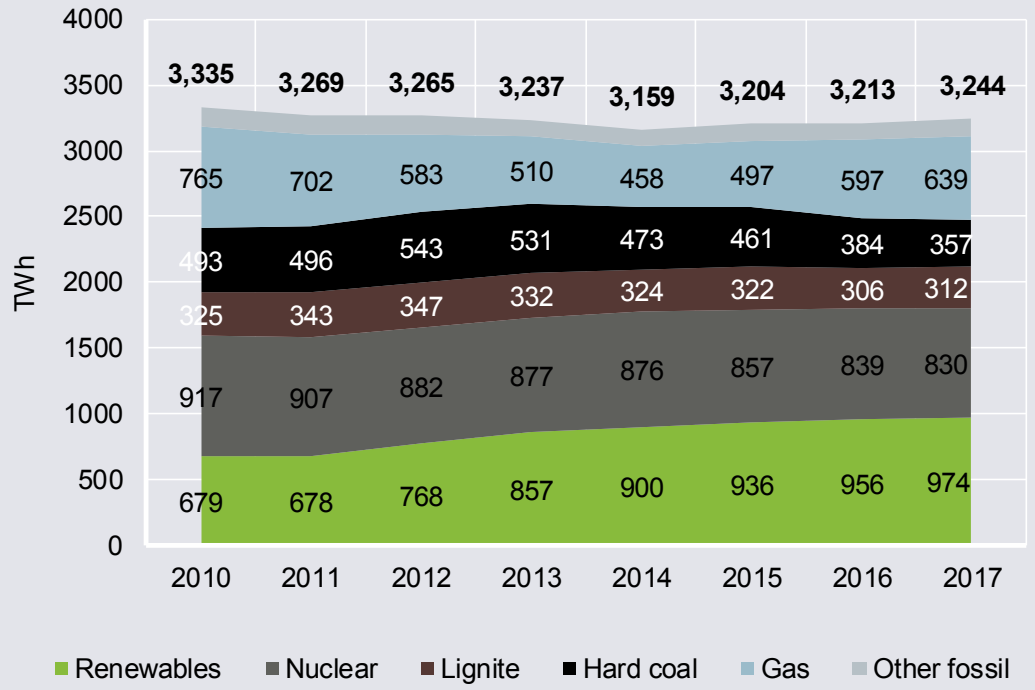
Key Findings

5

Western Europe is phasing out coal, but Eastern Europe is sticking to it. Three more Member States announced coal phase-outs in 2017 - Netherlands, Italy and Portugal. They join France and the UK in committing to phase-out coal, while Eastern European countries are sticking to coal. The debate in Germany, Europe's largest coal and lignite consumer, is ongoing and will only be decided in 2019.

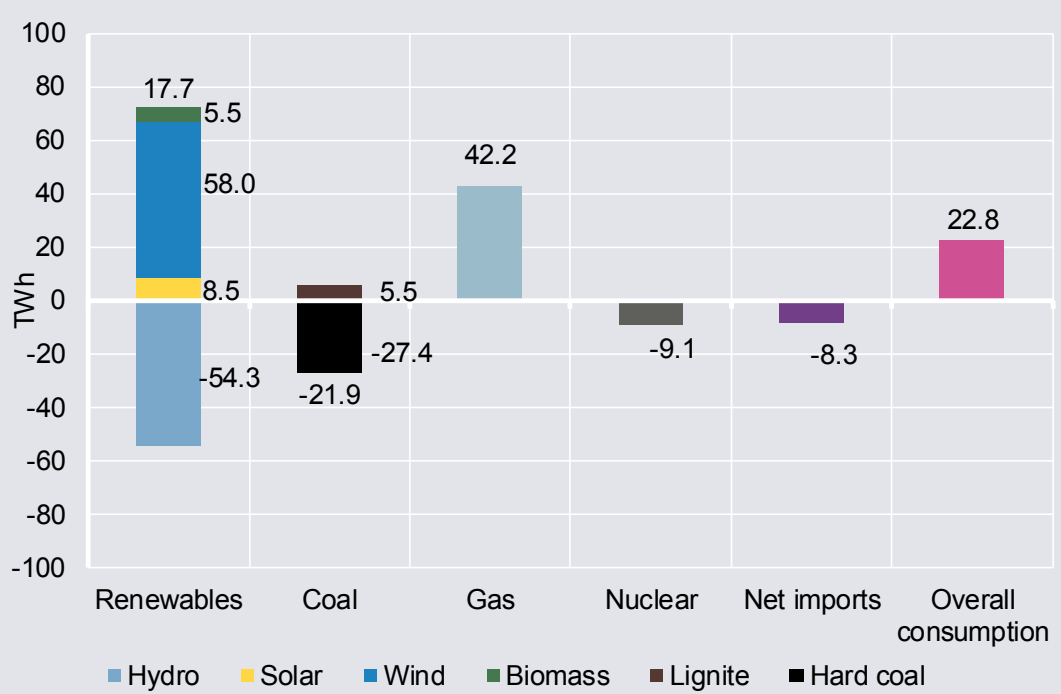
Wind displaces Coal; Gas fills in for poor year Hydro and Nuclear; Rising consumption prevents fossil generation falling.

EU electricity generation, by fuel type



EUROSTAT data to 2015, 2016 and 2017 are own calculations

Changes in electricity production and consumption (2016 to 2017)



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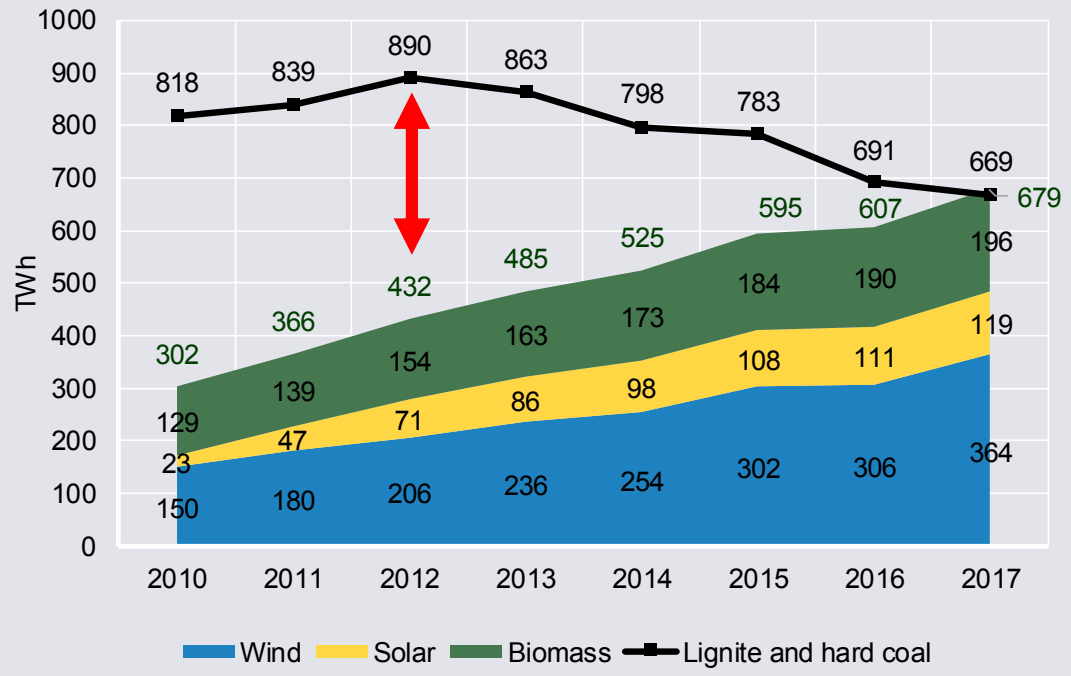
Wind, sun and biomass overtook coal in 2017!

Main reason: Surge in wind capacity with *potential* records in offshore and onshore installations

Renewables versus coal electricity generation



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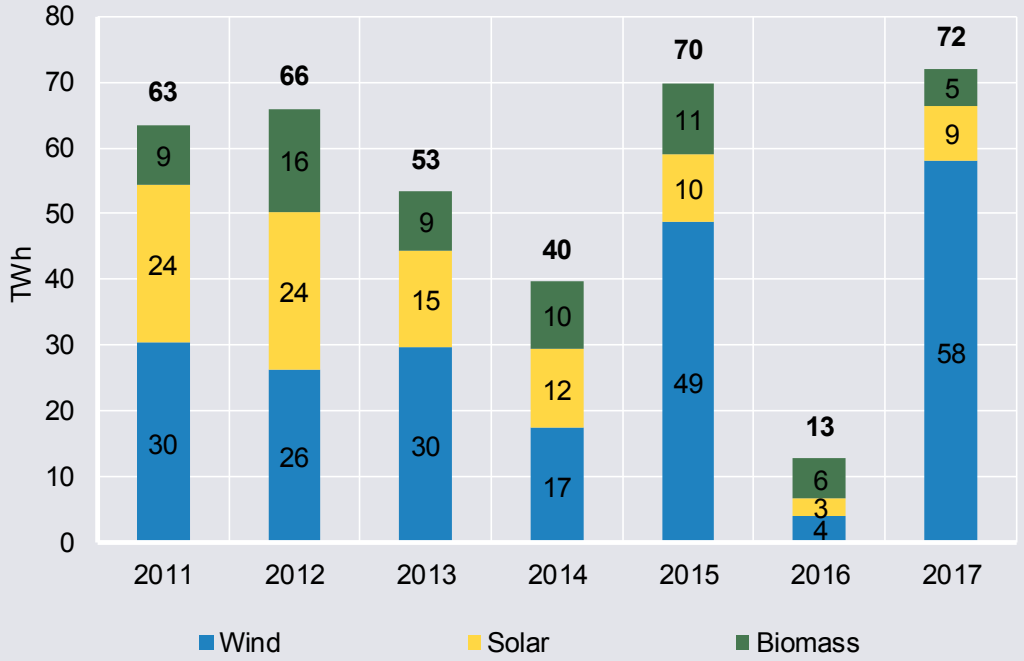
Changes in non-hydro renewables generation by country



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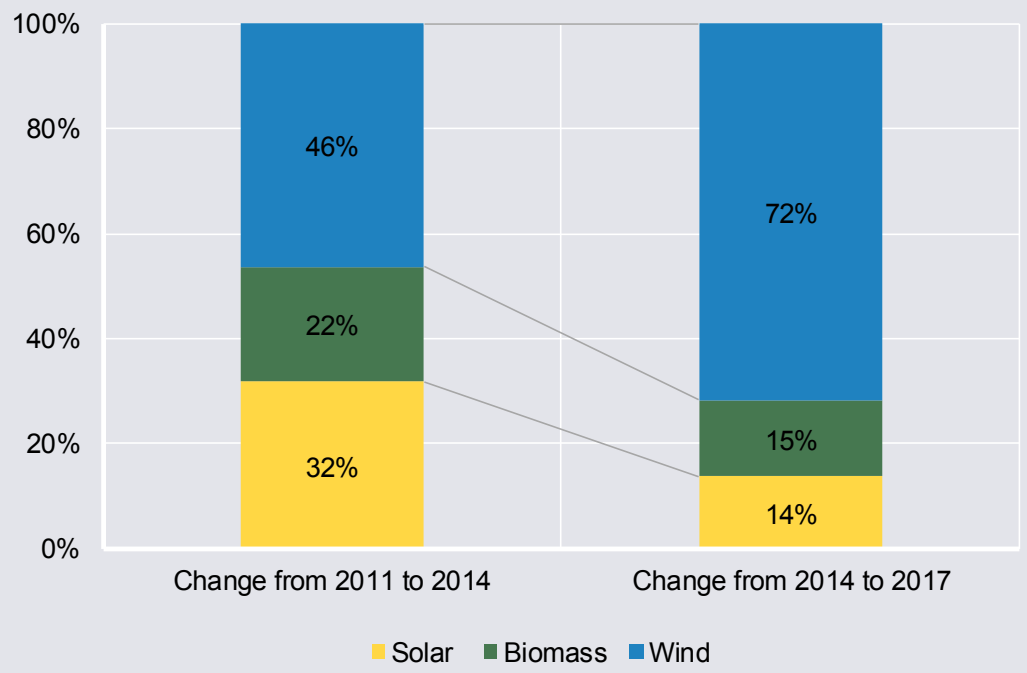
Renewables growth has got more uneven:
Technologically (focus on wind)
Geographically (focus on DE/UK)

Changes in non-hydro renewables generation by type



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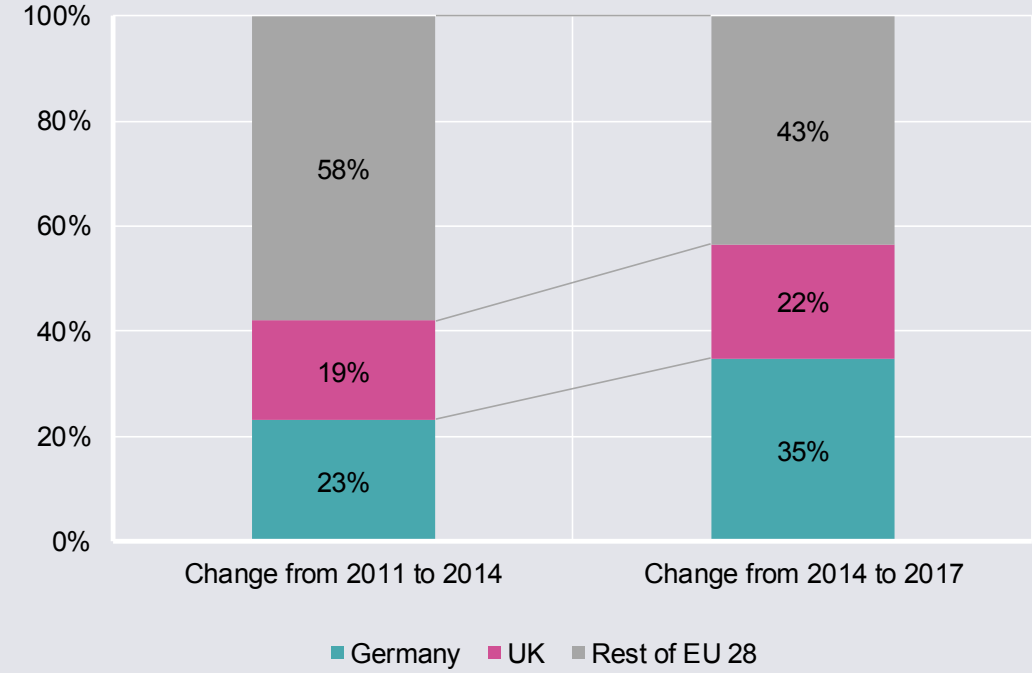

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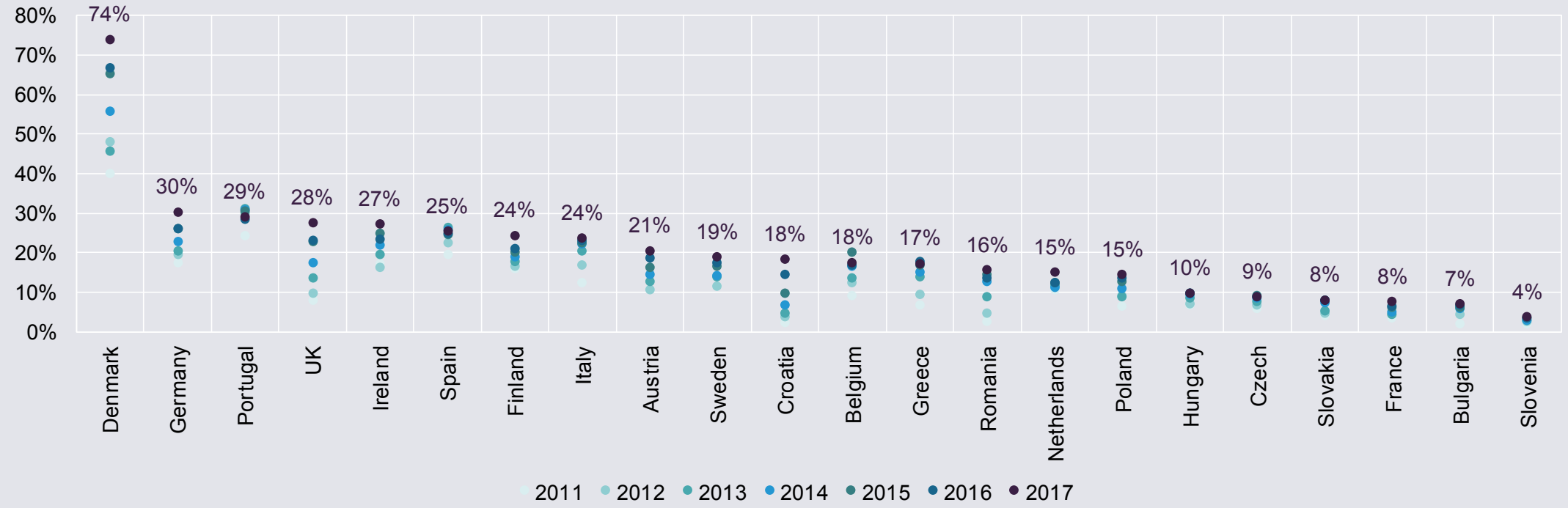
Denmark soars to 74% wind+solar+biomass!

UK is next biggest increase since 2011

Wind, solar and biomass as percentage of national electricity production

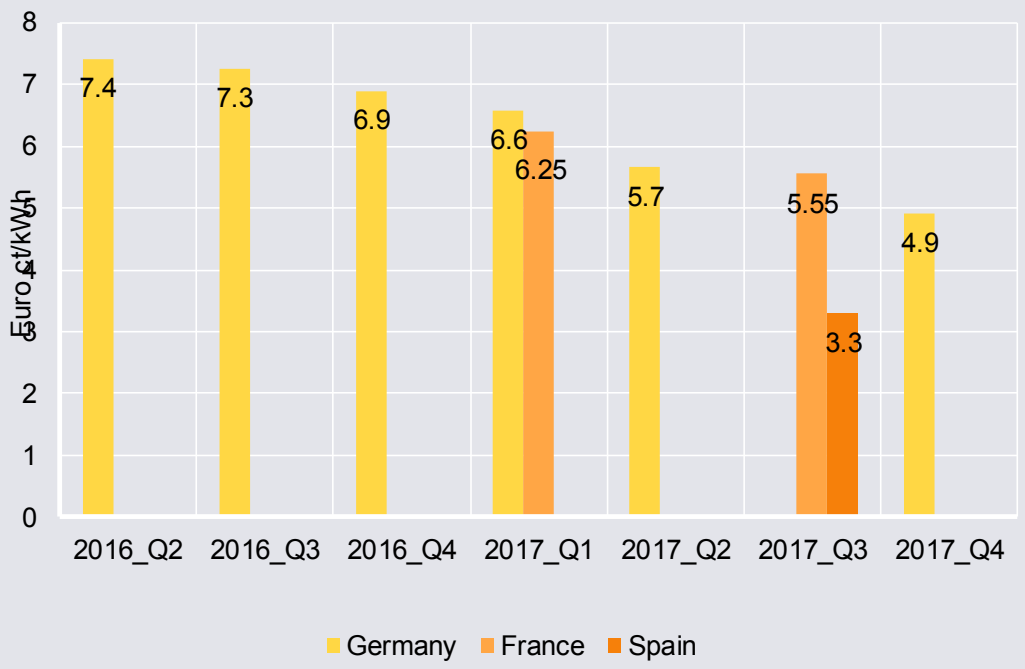


EUROSTAT data to 2015, 2016 and 2017 are own calculations; LT, LU, CY, EE, LV, M not included due to lower data quality

Where are you solar!?

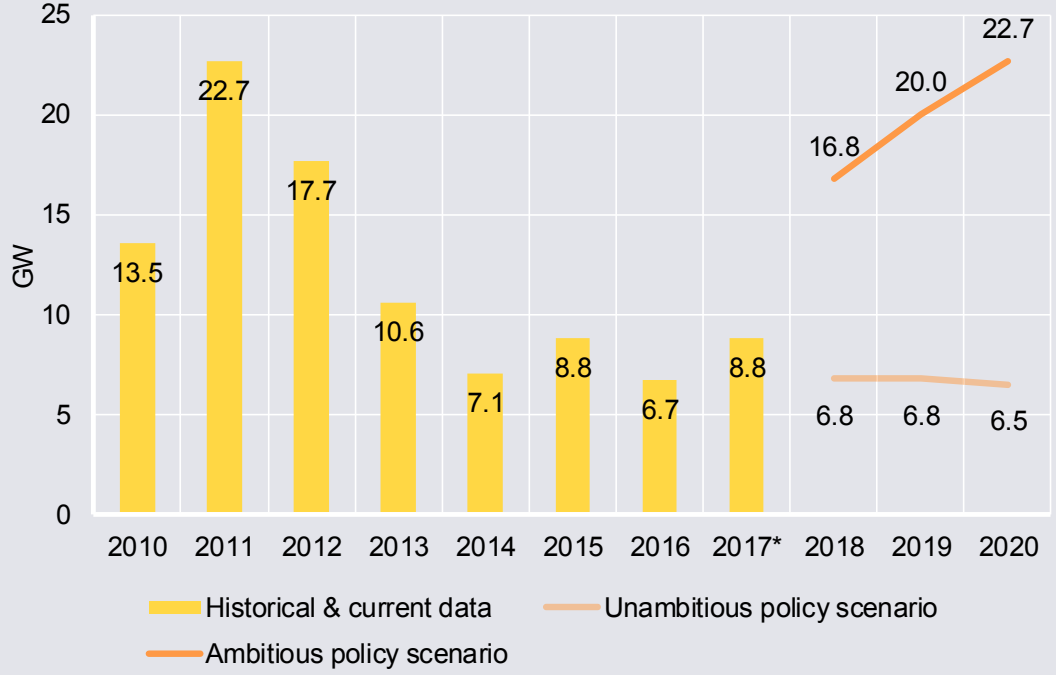
Cheaper than wholesale electricity prices
+ Ready to scale up

Solar PV auction results 2016-2017 (avg. prices, ground-mounted)



BNetzA 2016/2017, globalfinance.solarenergyevents.com 2017,pv-tech 2017

Annual solar PV installations

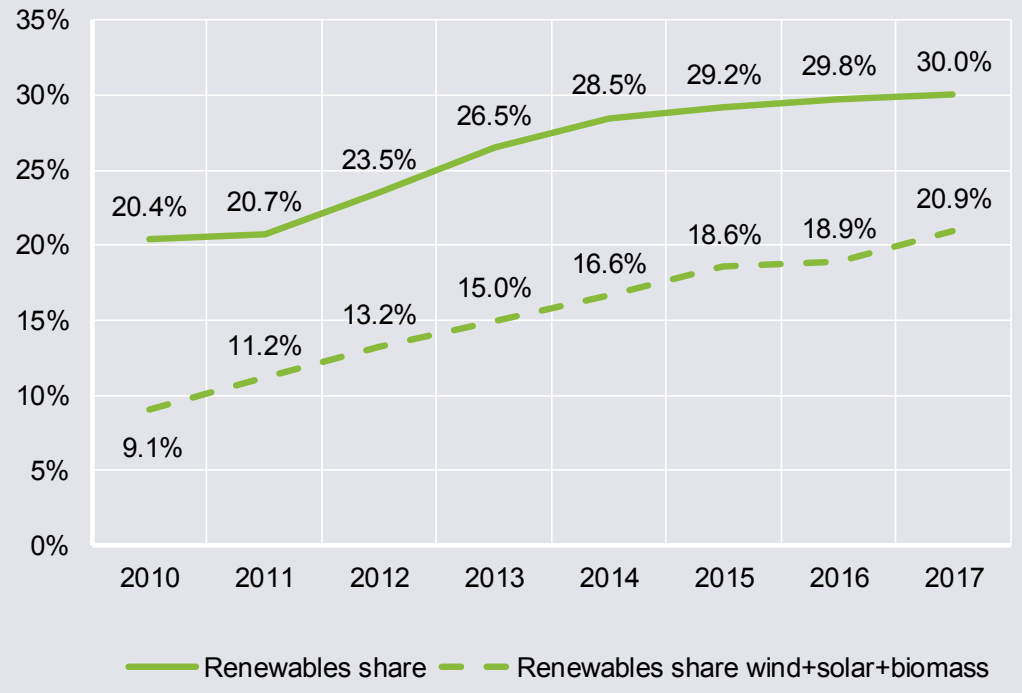


Solar Power Europe 2017, *latest forecast

30% of EU electricity from renewables!

On-trend for 27% renewables share of final energy demand by 2030; 35% possible!

Renewables share (%) of gross electricity production



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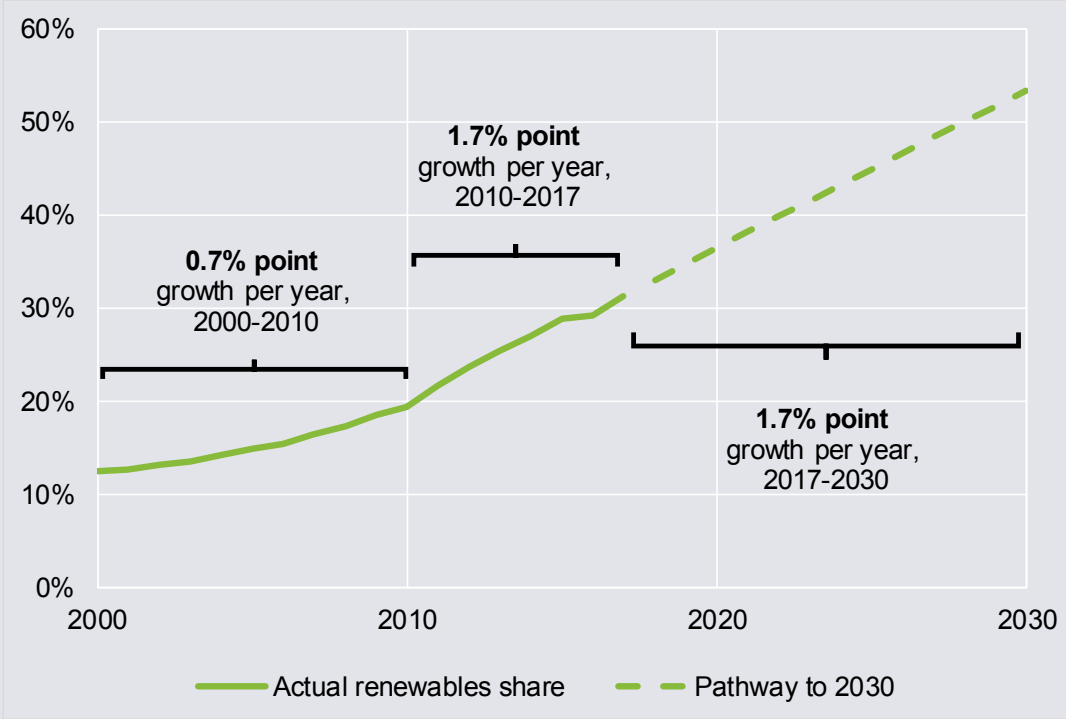
Renewables share (%) of gross electricity production: 2050 Trend

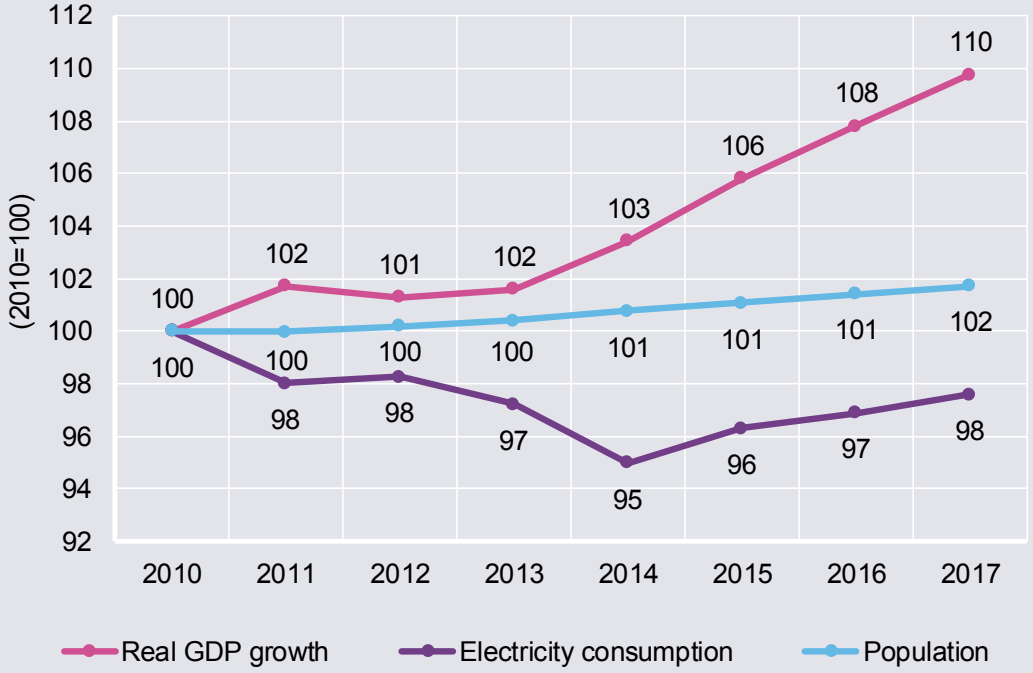


EUROSTAT (2015, 2016, 2017 own calc.), normalised hydro

Electricity consumption rises (0.7%) third year in a row

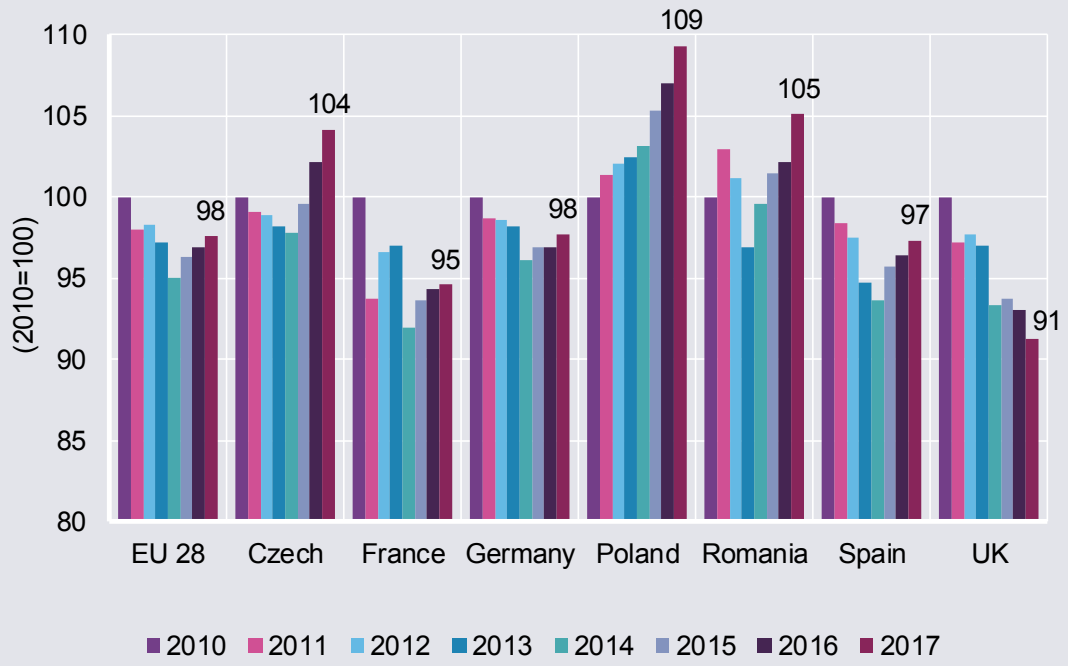
Power consumption does not decouple enough from economic growth

EU electricity consumption (indexed)



EUROSTAT 2018

Electricity consumption by country (indexed)



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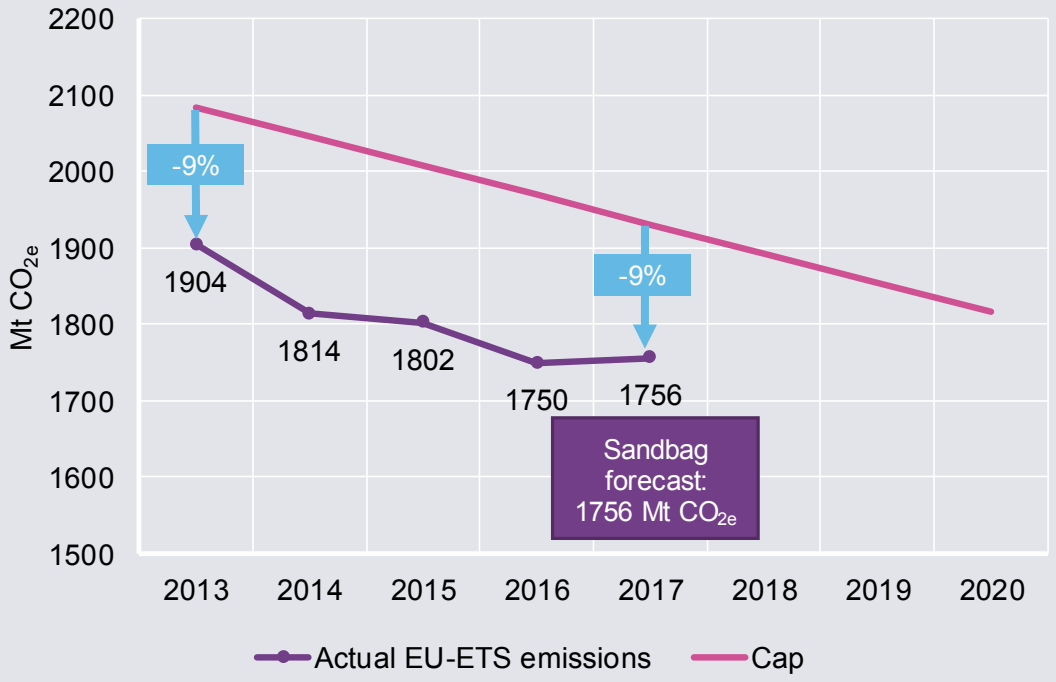
Still no scarcity in the EU ETS:

Cap 9% above actual emissions

Cumulative surplus almost twice the annual emissions of the entire EU ETS

ETS cap 2013-2017



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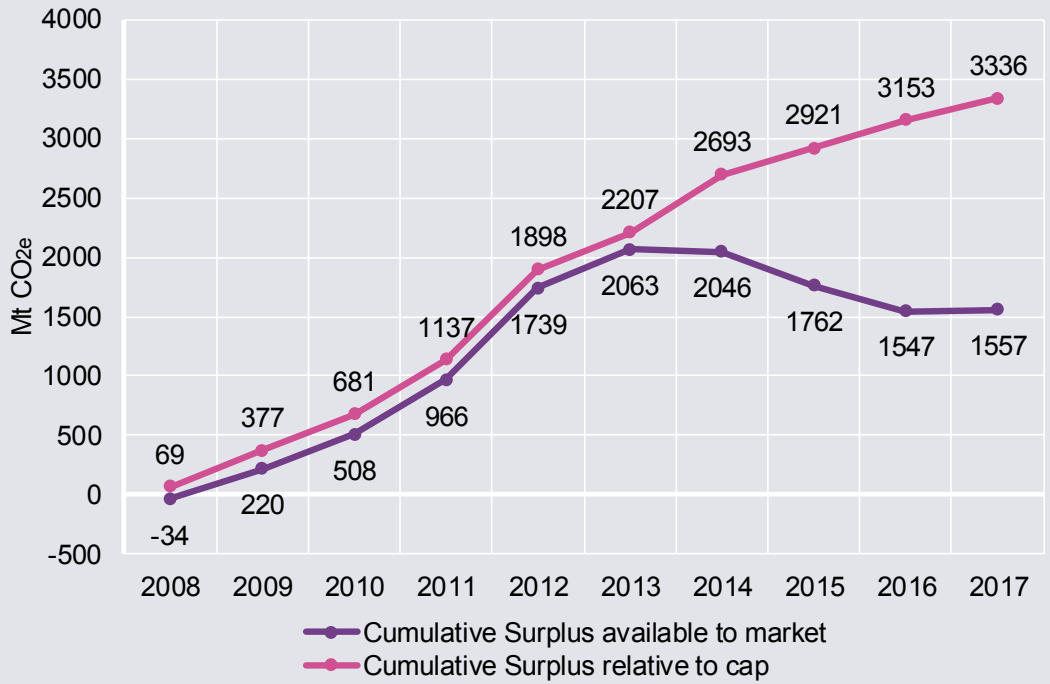
ETS surplus 2008-2017



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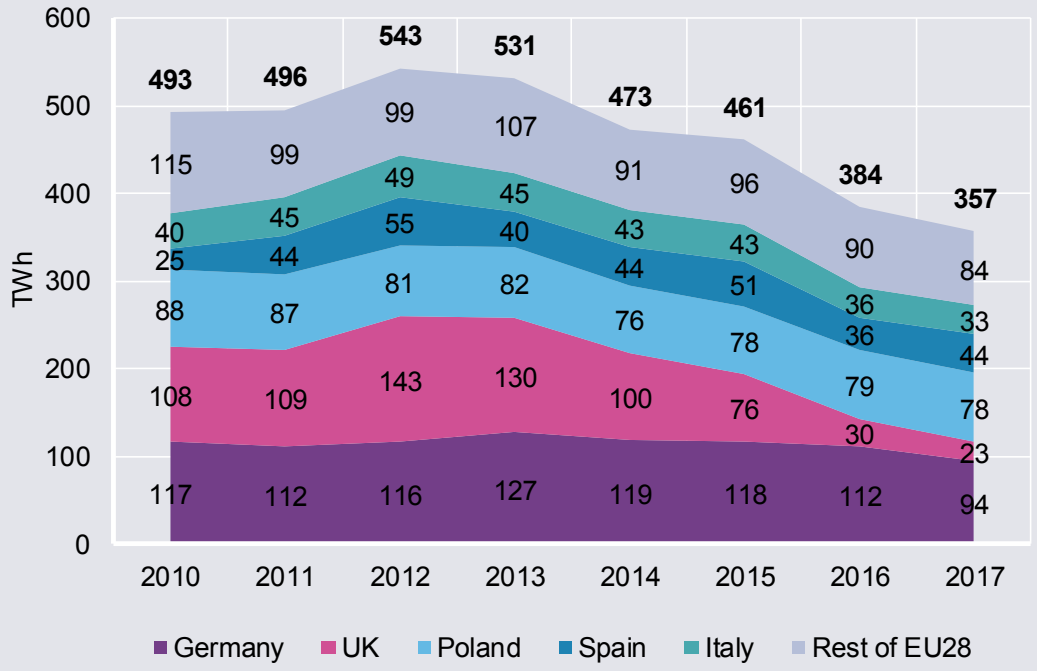
Coal: Hard coal is falling, lignite is not

Europe‘s 256 coal plants
= 38% EU-ETS CO2 = 15% total EU GHG

Hard coal electricity generation (including split of top 5 countries)



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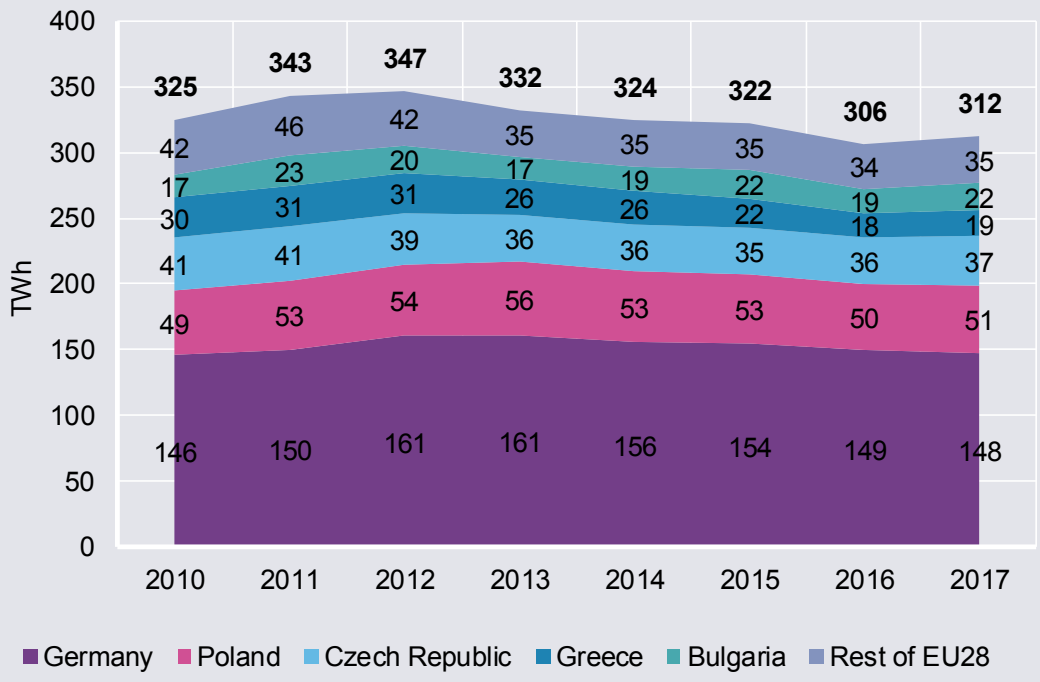
Lignite electricity generation (including split of top 5 countries)



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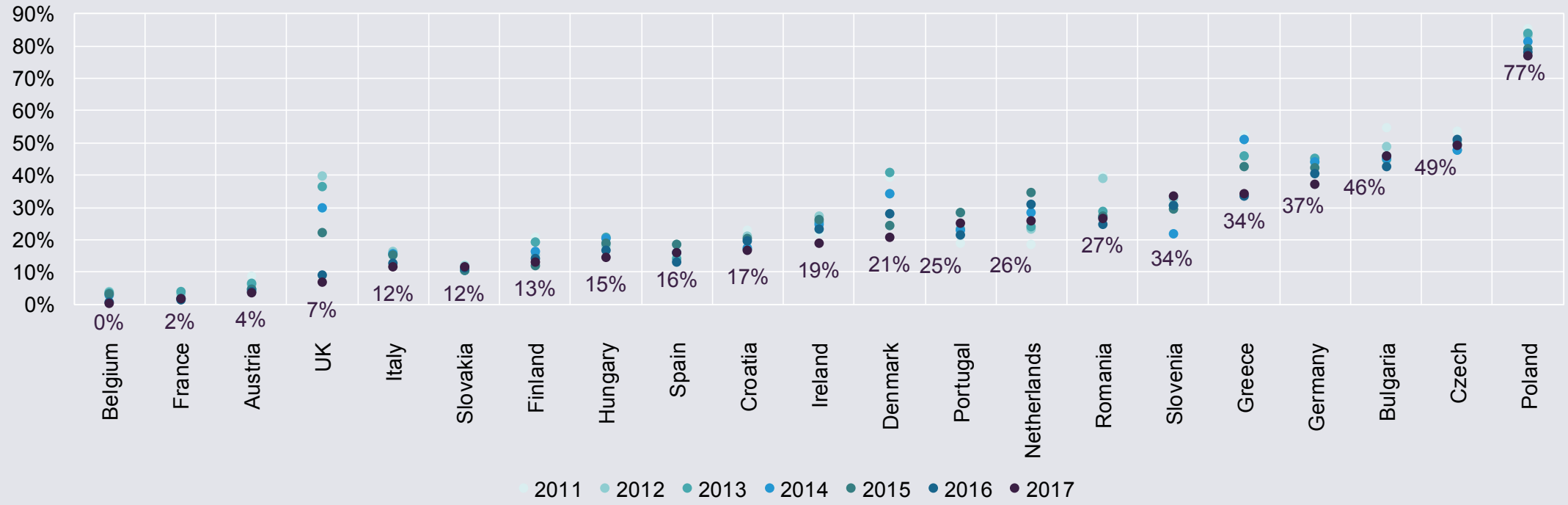
Coal 2010-17: Biggest fallers = Denmark + UK

= Biggest renewables increases (+ Gas falling!)

Germany still fourth most coal-intensive electricity...

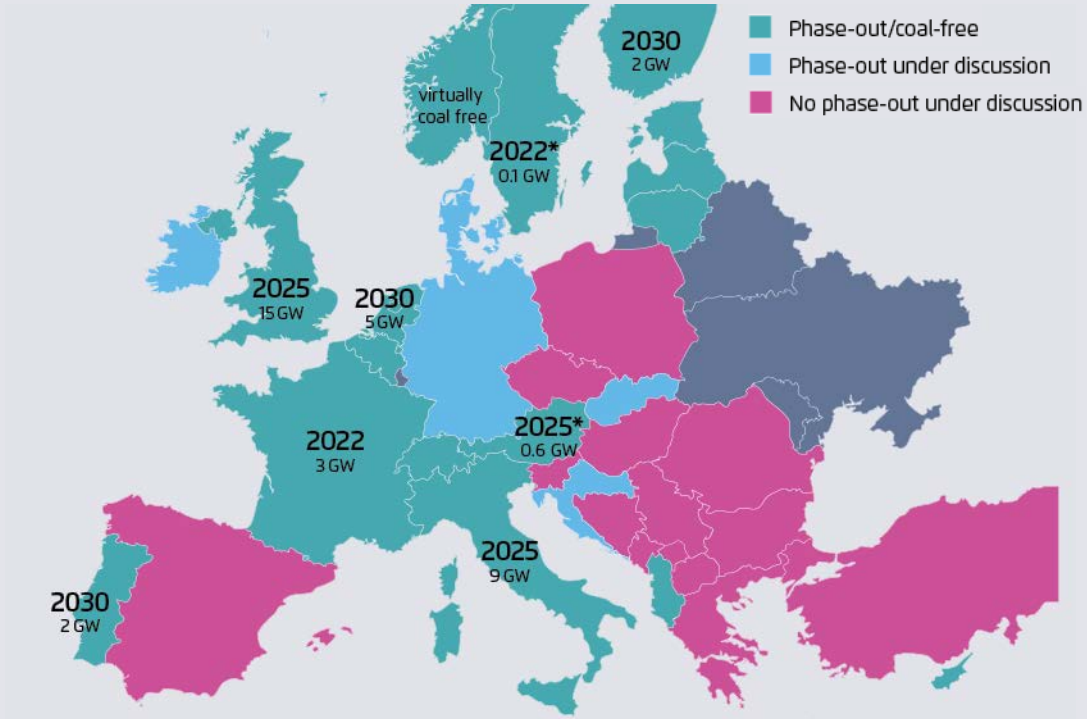
Hard coal and lignite as percentage of national electricity production



EUROSTAT data to 2015, 2016 and 2017 are own calculations; LT, LU, CY, EE, LV, M, have no coal power plants.

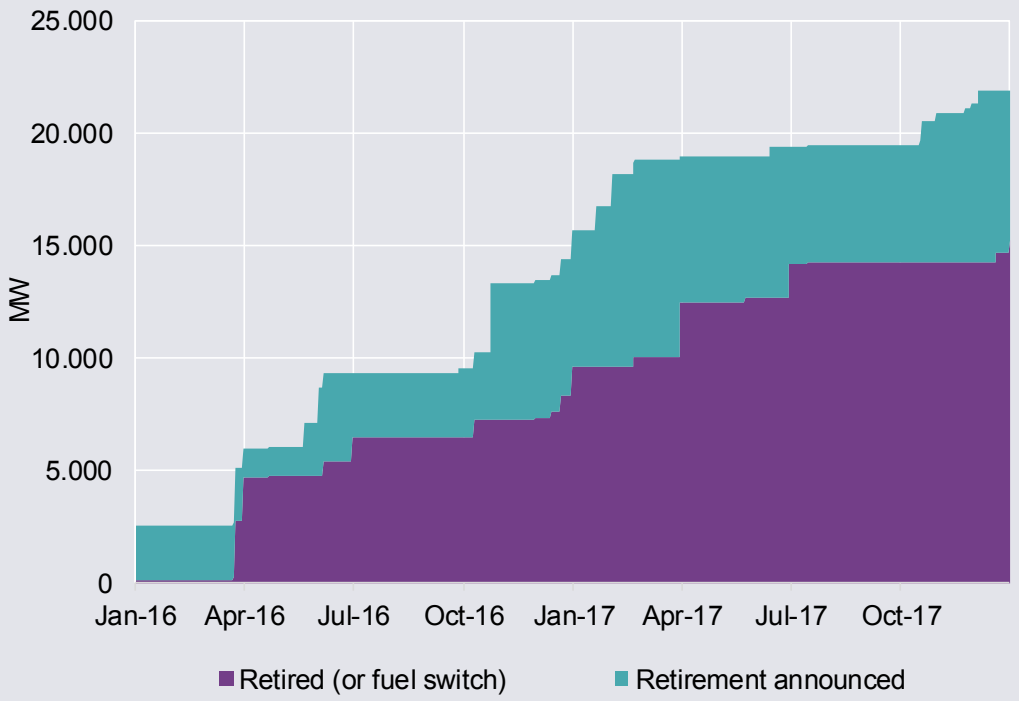
Coal phase-out plans: Western Europe is announcing phase-outs, Eastern Europe is not – and Germany is still discussing it.

Coal phase-out years and operational capacity



Europe Beyond Coal campaign 2018

Coal plants retired or announced to retire



Europe Beyond Coal campaign 2018

Thank you for your attention!

Questions or Comments? Feel free to contact us:

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Sandbag is a not-for-profit climate change policy think tank based in Brussels and London.

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