

FLAME CONFERENCE

Where Will New Gas Demand Come From?

Wednesday 11th May 2016

Dr Anouk Honoré
Senior Research Fellow
OIES Natural Gas Programme
Anouk.honore@oxfordenergy.org

OIES Natural Gas Research Programme

WE ARE: a gas research programme at a Recognised Independent Research Centre of Oxford University, specialising in fossil fuel research

WE ARE NOT:

- consultants
- sellers of exclusive, high price business reports

WE PRODUCE: independent research on national and international gas issues

WE ARE FUNDED BY: sponsorship by companies and governments in gas producing and consuming countries

Information about our Institute, our Natural Gas Research Programme and the publications can be found on our website:

<http://www.oxfordenergy.org/gasprog.shtml>

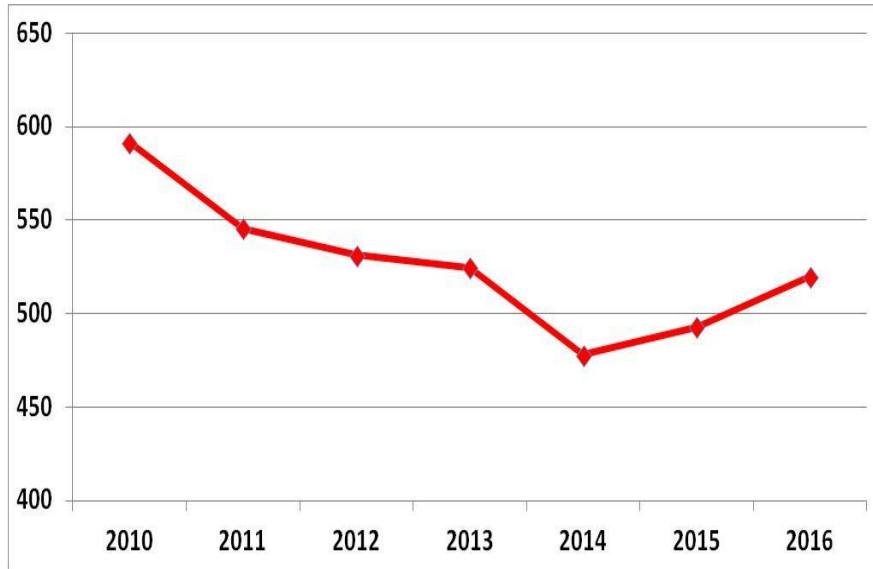
Where Will New Gas Demand Come From?

Outline

- Focus on the next 5-10 years
- Lessons from 2015/16: signs of recovery?
- Focus on the main demand sectors: power, industry, residential and transport
- Conclusions

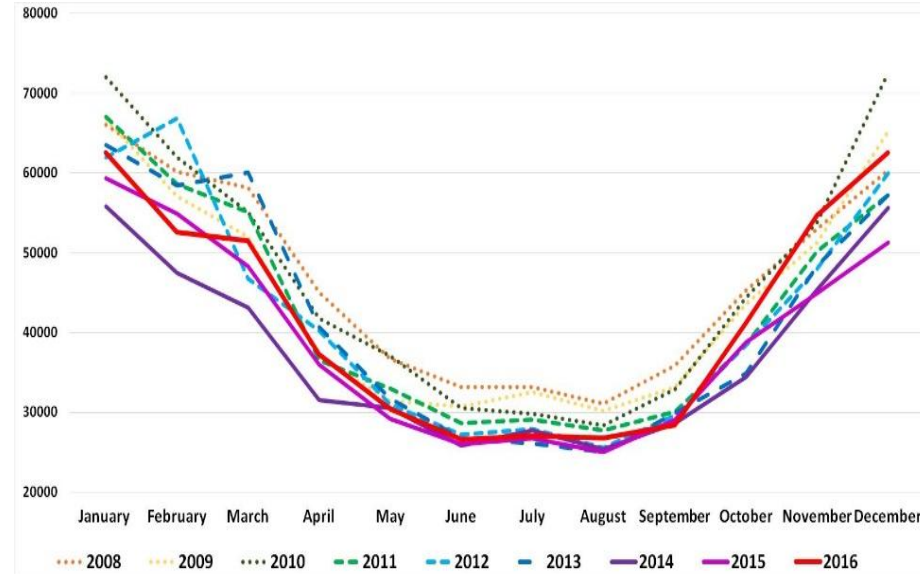
Natural gas demand in Europe increased in 2015 / 2016

Gas demand in 31 countries in Europe, 2010-2016 (bcm)



Sources: IEA data (2010-2015), JODI data (2016)

Monthly gas demand in OECD Europe, 2010-2016 (mcm)

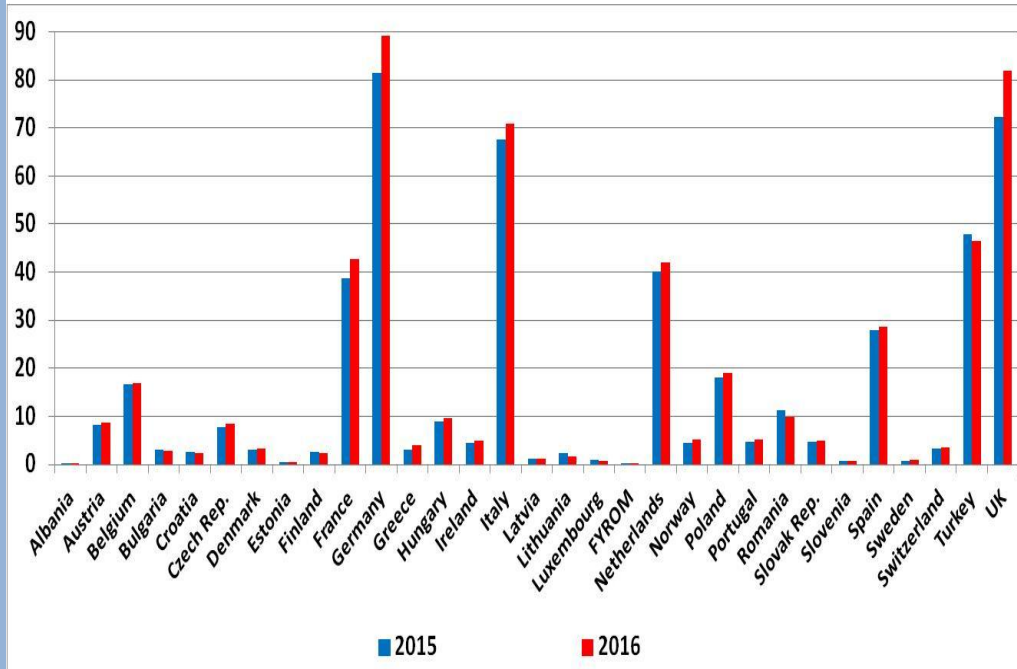


Source: IEA data

- 2016: 520 bcm (+6%)
- H1: mild temperatures reduced gas demand for space heating, but this was partly offset by gas for power generation thanks to falling gas prices
- Q4: gas demand growth accelerated driven by low temperatures (especially when compared to 2015), and the share of gas in the generation mix was boosted by higher coal prices, closure of coal plants and French nuclear issues

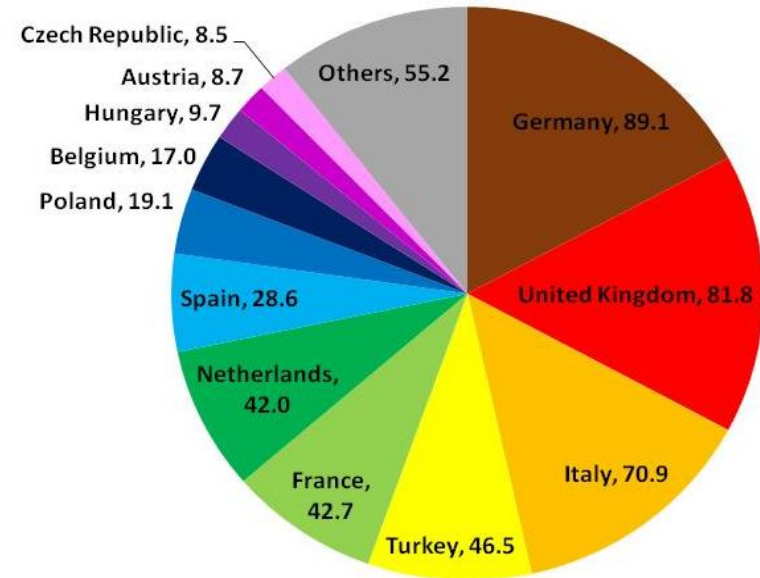
The UK and Germany drove the growth

Gas demand in 2015 vs 2016, per country (bcm)



Source: JODI data

Gas demand in 2016, per country (bcm)



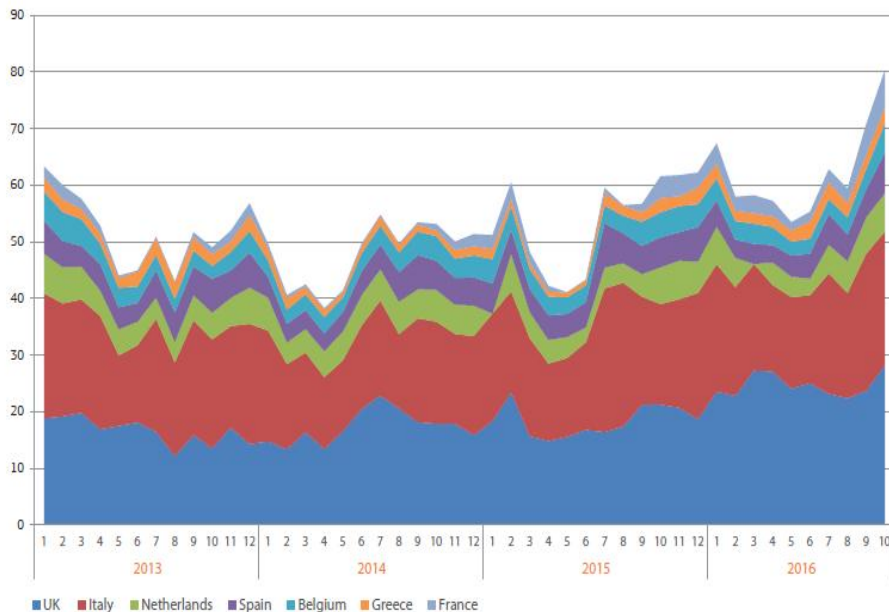
Source: JODI data

- The seven biggest gas markets covered more than 80%
- Gas demand was higher in 24 countries out of 31
- UK (10 bcm) and Germany (8 bcm) showcased the biggest growth followed by France (4 bcm), Italy (3.4 bcm) and the Netherlands (1.9 bcm)
- Gas demand decreased significantly in Turkey (-1.4 bcm) and in Romania (-1.3 bcm)

Gas demand in the power sector... Signs of recovery??

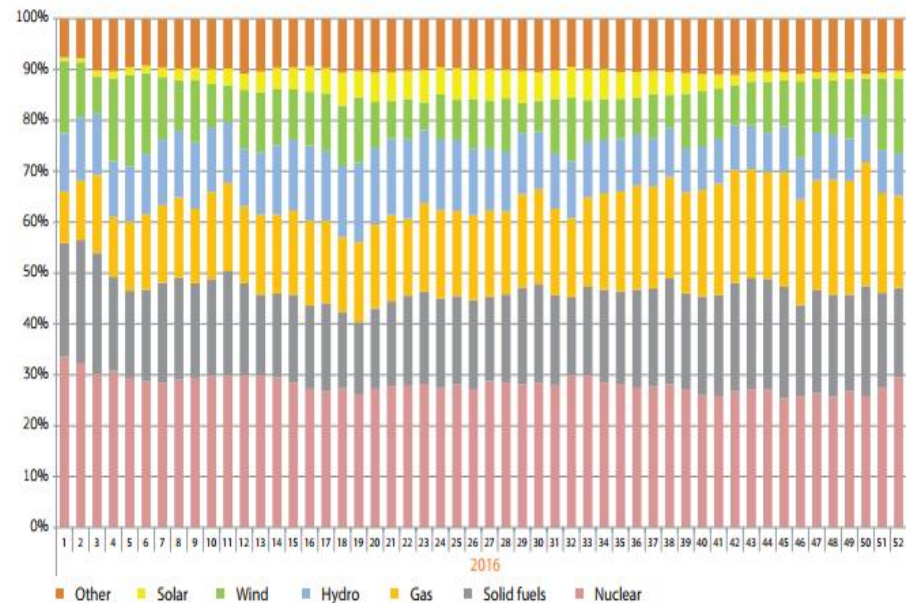


Gas to power in selected markets, 2013-2016 (TWh)



Source: Eurostat

Evolution of generation mix in EU28 in 2016 (%)



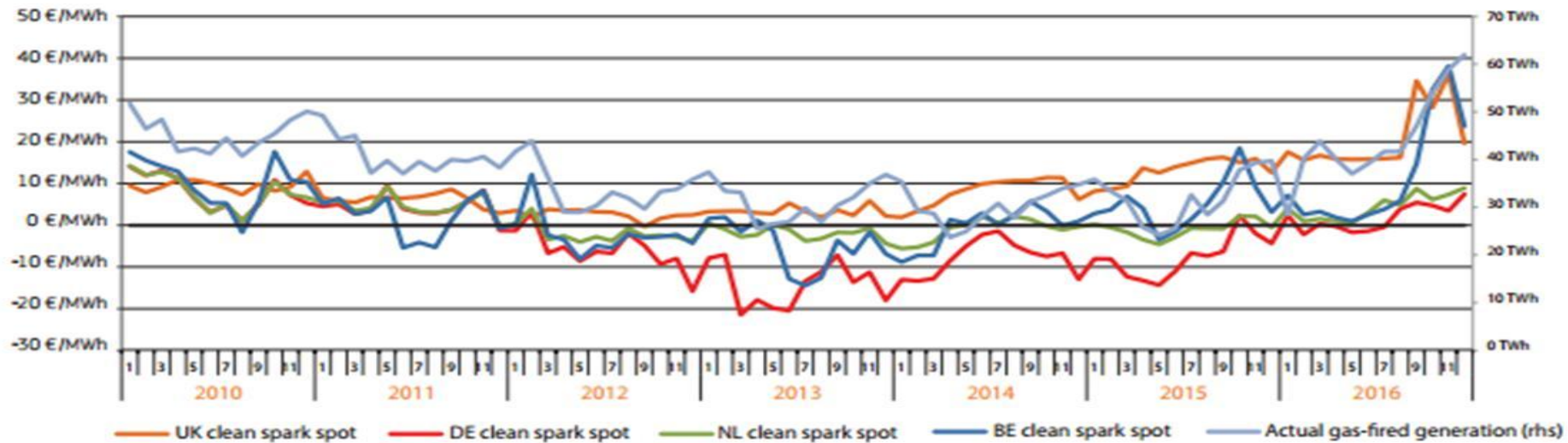
Source: ENTSO-E data

- 2016: flat electricity demand + growth of renewables in the mix
- But increase to gas deliveries to the power sector, esp. H2 mainly to the detriment of coal fired power plants due to the change in coal/gas prices competitiveness (H2 was also drier than usual in many countries)
- Strong wind, solar concentrated in the summer
- Nuclear had a fairly stable share although at the end of the year, the share declined due to significant capacities were taken offline

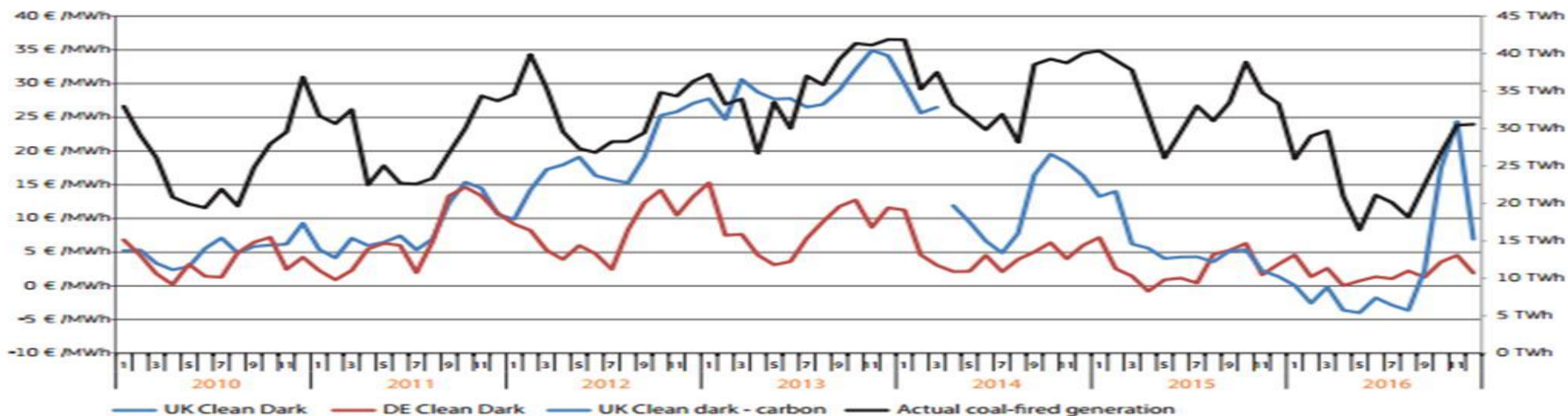


Coal / gas prices

Clean spark spreads in selected markets and electricity generation from natural gas in the EU28 (Euro/MWh and TWh)

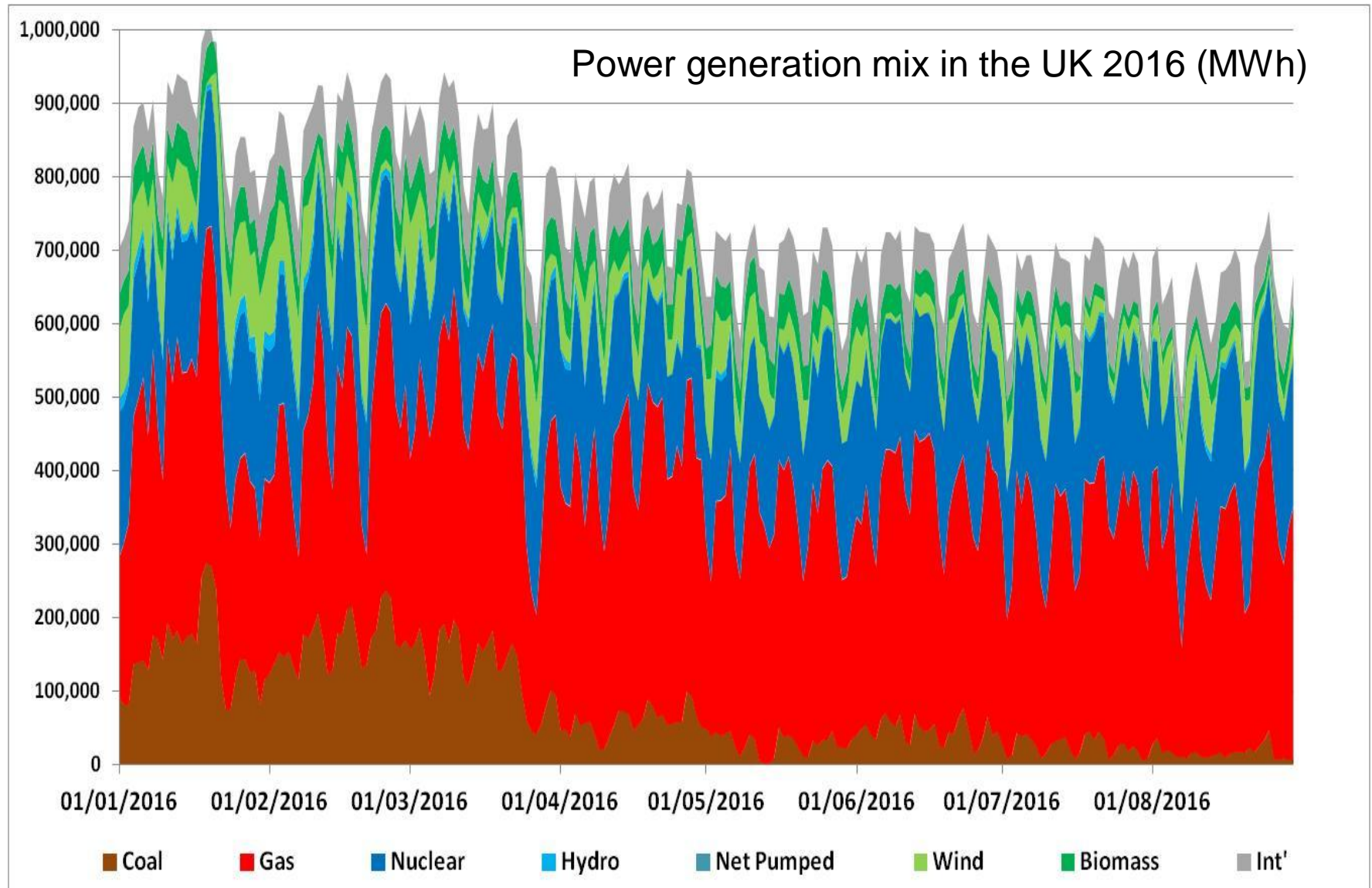


Clean dark spreads in selected markets and electricity generation from coal in the EU28 (Euro/MWh and TWh)





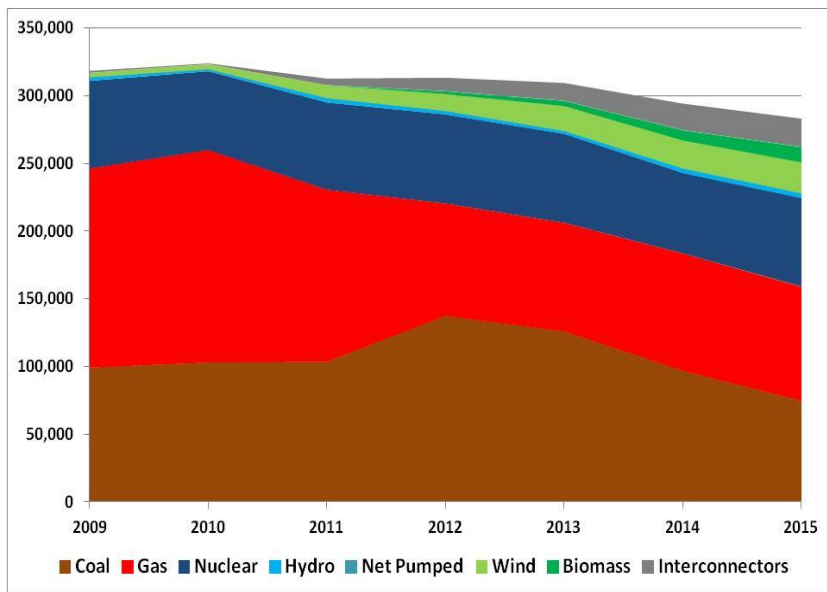
The carbon price floor in the UK helped to push coal out of the mix and favour gas in 2015/2016



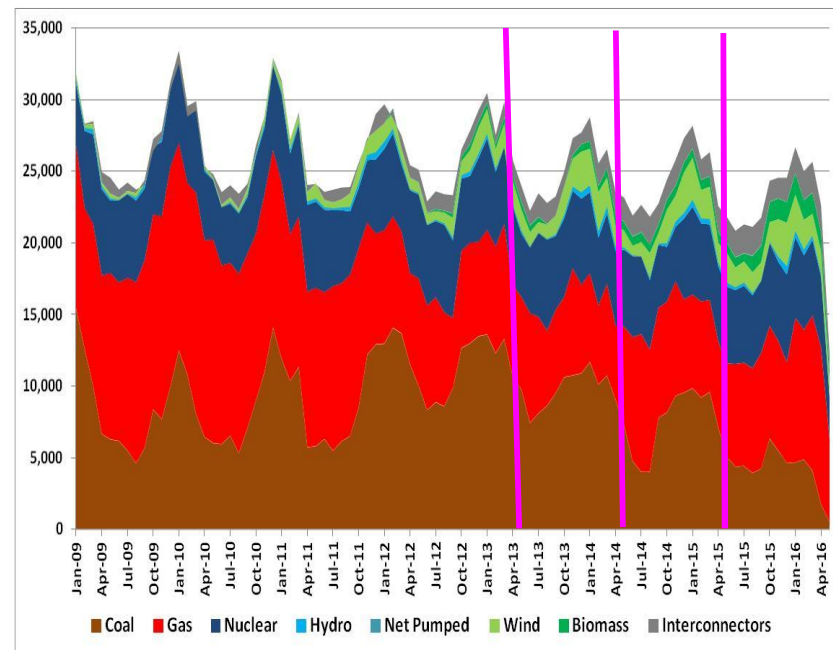


Can the UK's example be replicated in other markets ?

Annual power generation, 2009-2015 (GWh)

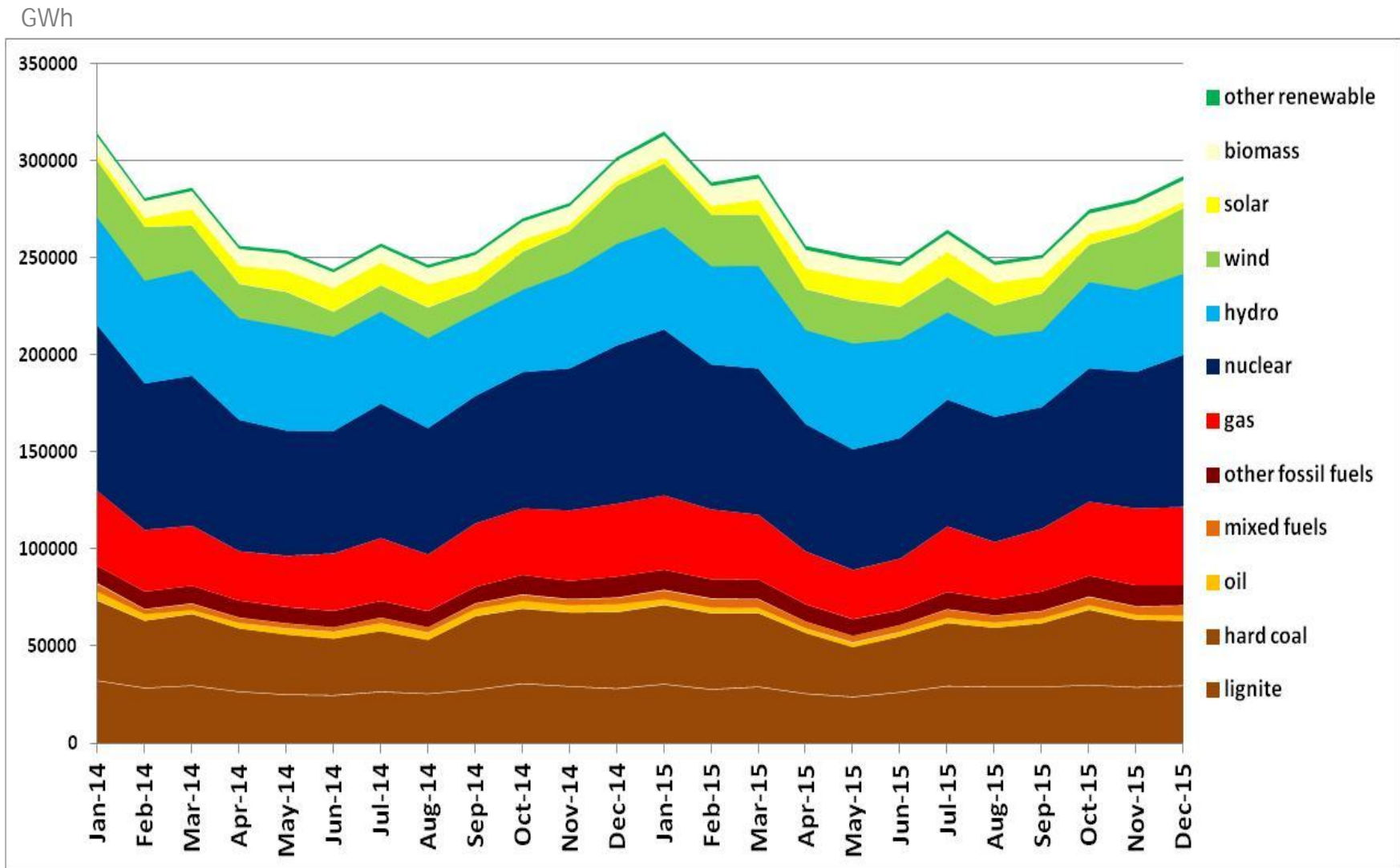


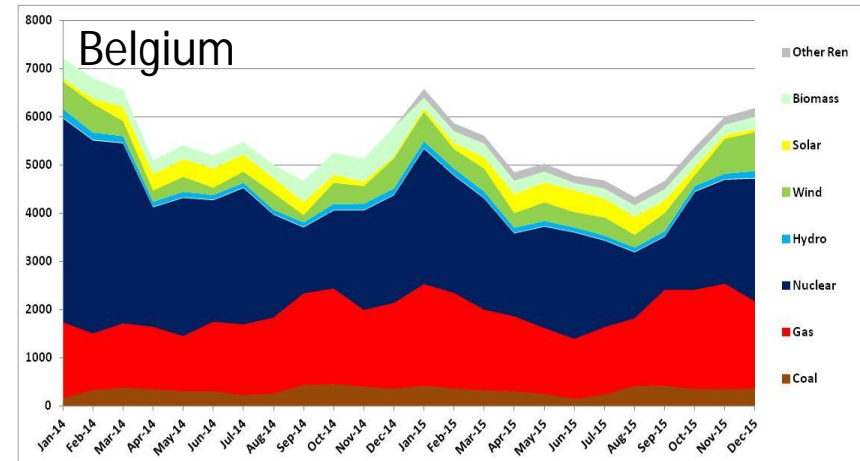
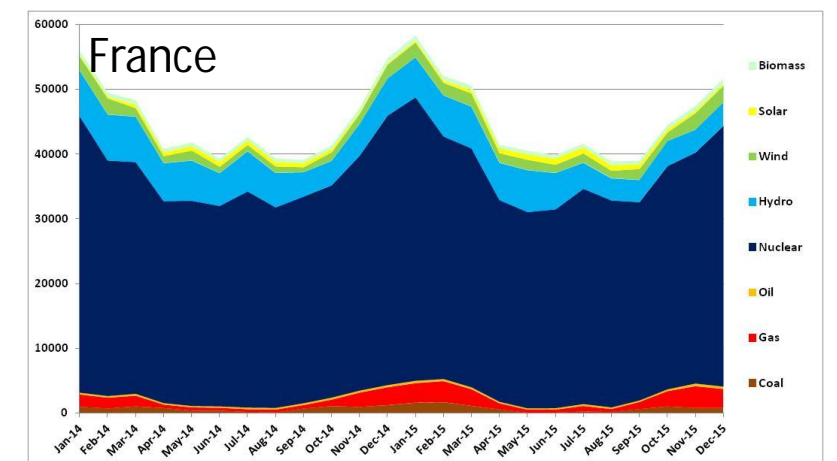
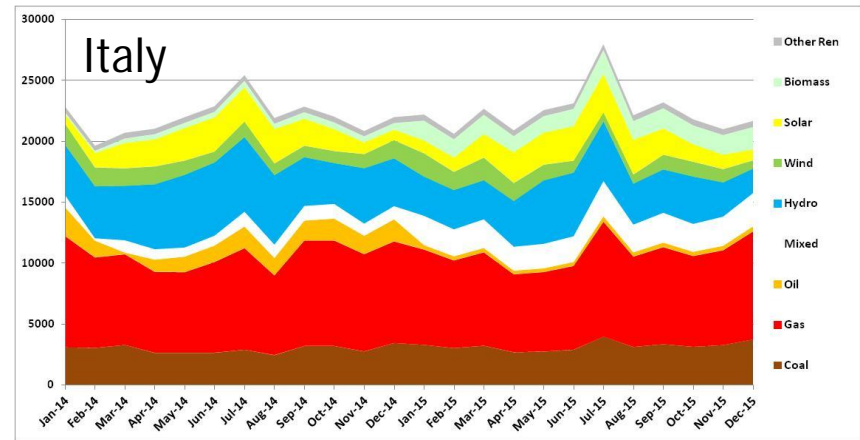
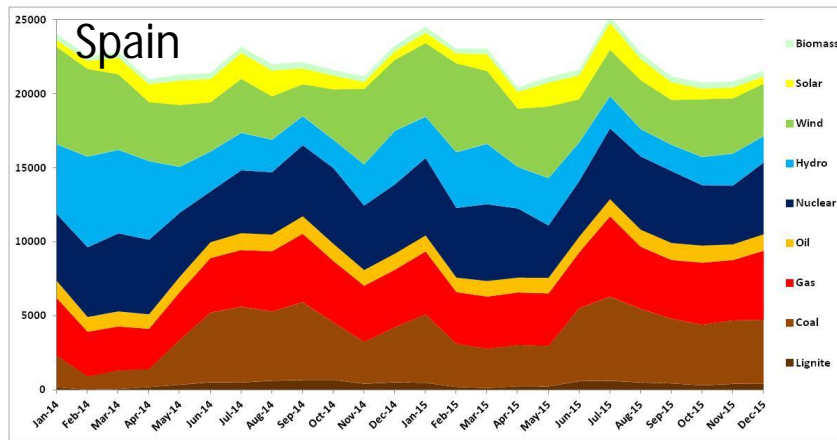
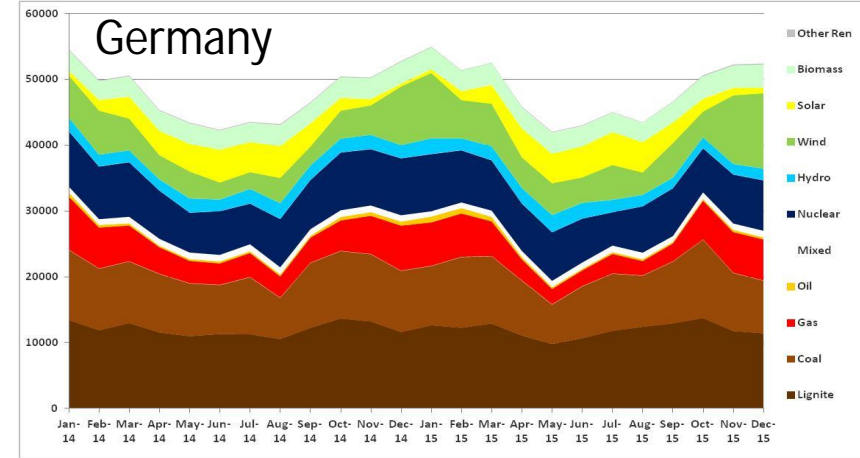
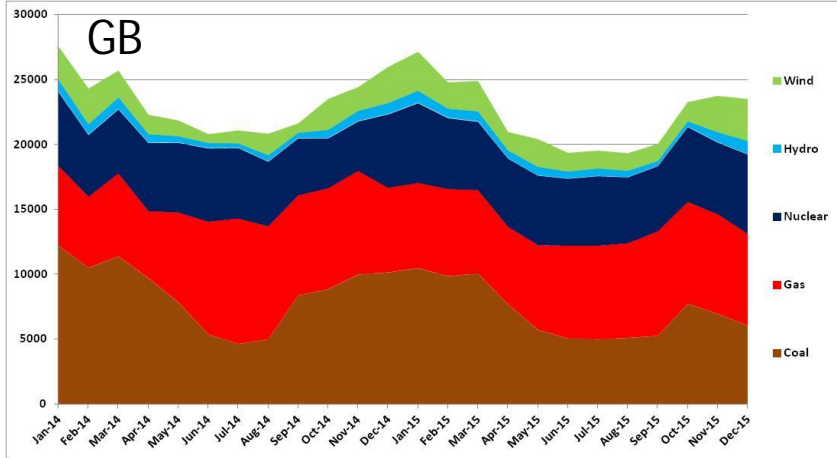
Monthly power generation, 2009-2016 (GWh)



- Carbon price floor Price reactive market
- Large amount of coal and gas can be used in the mix, and therefore switching/arbitrage from one to another is possible
- Large amount of coal shut down due to LCPD, and continued in 2016
- Somewhat of an "island"
- Low level of renewables
- => growing share of renewables + lower demand => no return to pre-2010s situation

Europe : lots of coal in the mix, so potentially large scale of coal to gas switching is possible... At least on paper

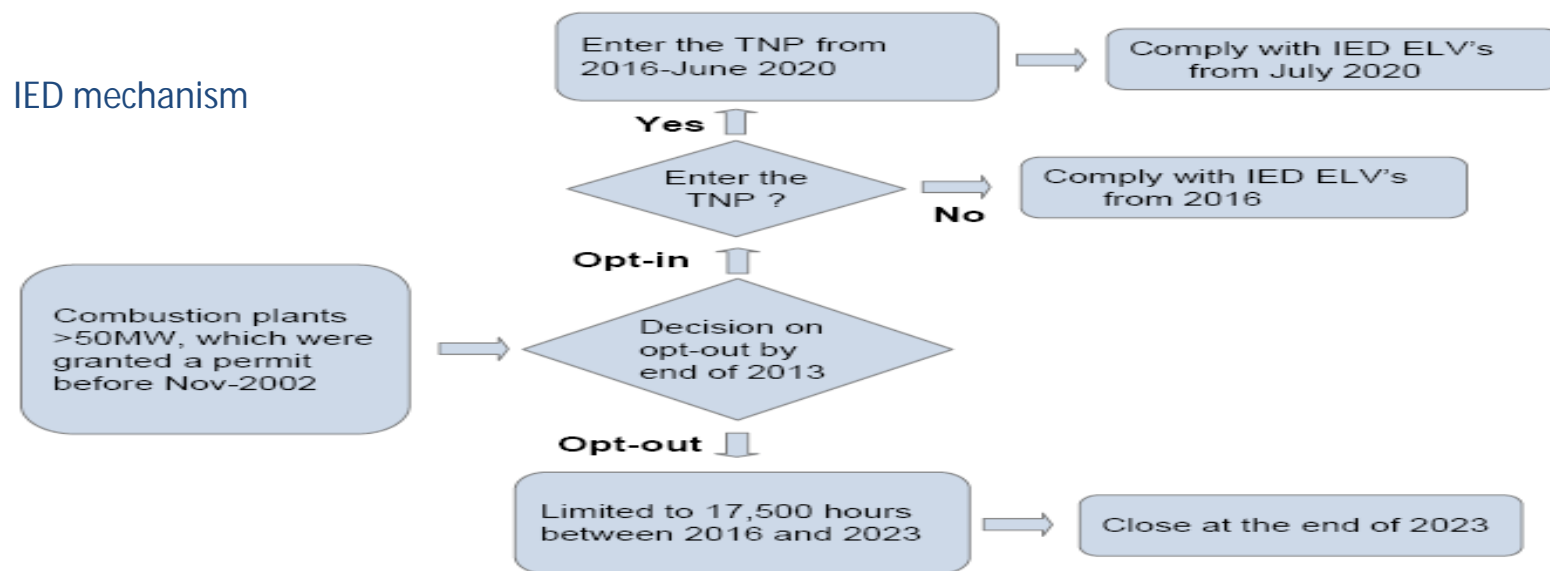




The next 5 – 10 years: power sector

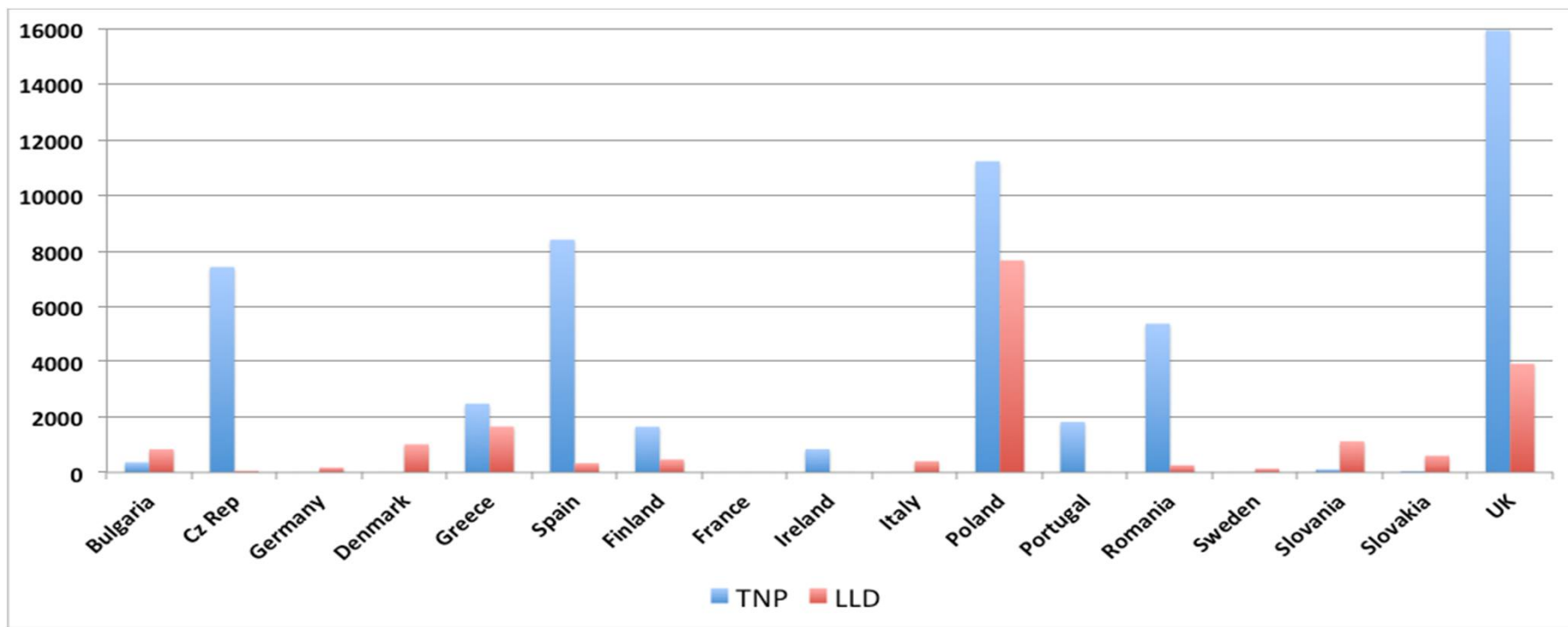
- No “one scenario fits all”
 - ✓ Existing role of gas in the generation mix
 - ✓ Active support / dismissal
 - UK: gas for power demand to cover higher share in the mix
 - Turkey: everything but gas in the mix!
 - ✓ Expectations in question / uncertain signals
 - Germany: nuclear phase out, discussions on lower coal share in the mix
 - Belgium, Spain: nuclear phase out U turn
- Main arguments for gas in power in this timeframe
 - ✓ Abundant supply / LNG wave
 - => no security of supply issue to be expected
 - => no return to 2011-2014 prices
 - ✓ Switching from coal to gas saves CO₂ emissions and meet 2020 targets!
 - => Use the existing gas fleet
 - => Burning gas is a more efficient way to use a limited carbon budget than combusting coal or oil (COP21)

NOW is the time to make the arguments of immediate benefits



- ~150 GW of coal capacity in Europe
 - ✓ Less than half have simply opted in
 - ✓ => Derogated coal plants represent ~80 GW !
 - TNPs (comply from July 2020)
 - Limited lifetime derogation (17,500 hours or close by 2023)
 - Other exemptions (District heating, local coal burn, accession treaty, isolated markets)
- ~80 GW do not comply YET... why invest & keep coal for longer ?

IED: major possible impacts... in a few countries



- ~80 GW of derogated coal plants
 - ✓ ~56 GW hard coal
 - ✓ ~26 GW lignite
- TNPs: ~56 GW (to convert by 2020)
- Limited lifetime derogation: ~19 GW (close by 2023)
- Others: ~7 GW



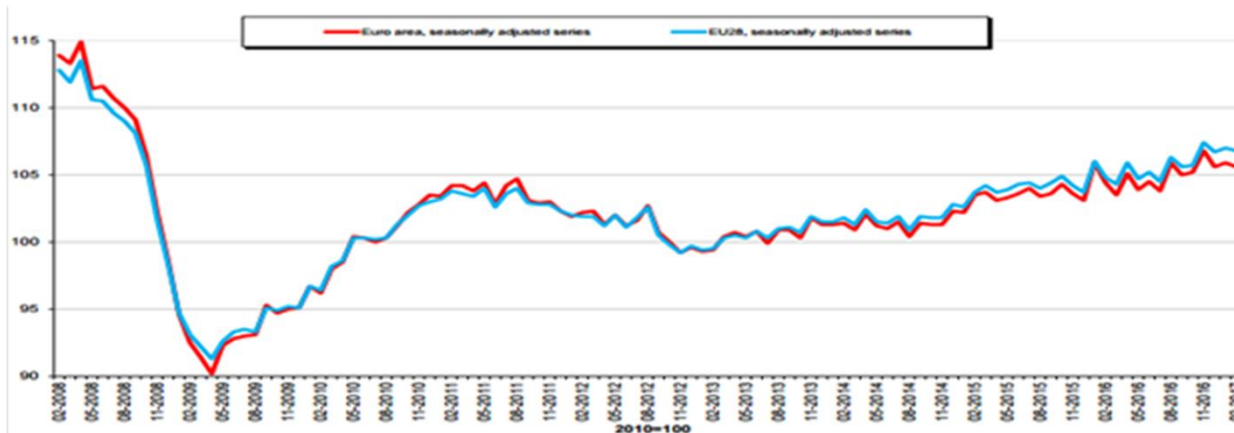
Potential for large amount of firm capacity to retire in the next 5 – 10 years

- Coal plants
 - ✓ IED impacts (UK, Poland, Spain, Cz Rep, Romania, Greece...)
 - ✓ National policies (UK, Germany, Netherlands, France...)
- Nuclear plants
 - ✓ Phase out and moratorium (Germany by 2022; uncertainties on others)
 - ✓ Economic shut down (Sweden)
 - ✓ Delays for new nuclear (UK)
- Oil plants
 - ✓ Limited
- The gap between power demand and how much renewables can fulfil could be widened quickly (with limited push)
 - ✓ Much will depend on how the gap is filled and how big the gap is
 - ✓ Possible role for gas to play in the next 5-10 years in the power sector, but only if large volumes of coal / nuclear capacity closures

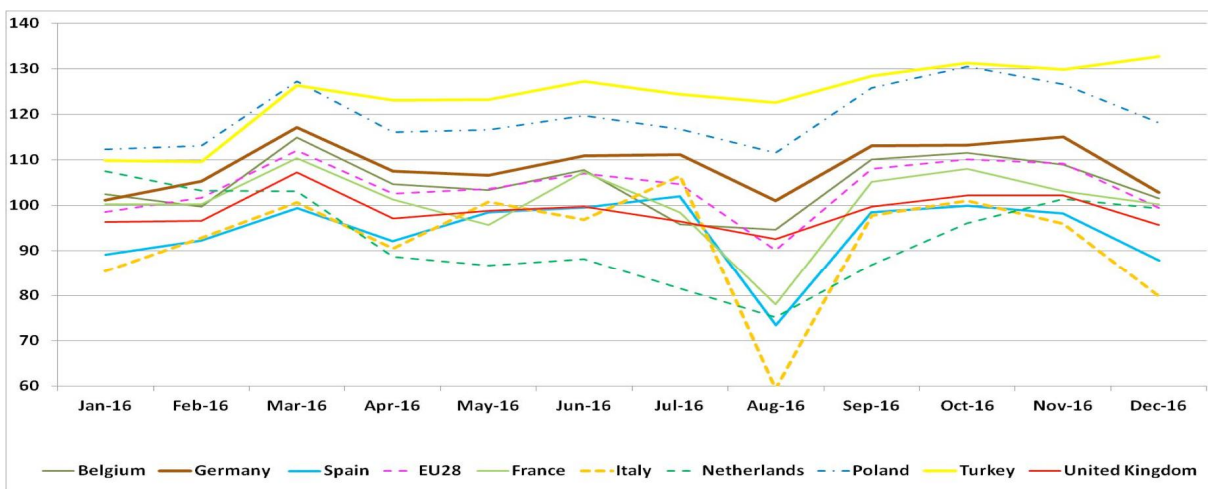


Industrial sector

Industrial production in Euro area and EU28, 2008-2017
(2010 = 100)



Industrial production in Euro area and EU28, 2008-2017
(2010 = 100)



- In 2016, industrial production continued its rising trend that started in 2013
- Stronger growth rates were registered in key markets such as Germany, with positive impacts on gas demand, but also in Turkey and Poland



The next 5-10 years: industrial sector

- Peaked 2000, in decline since then
- Key issues limiting gas demand growth:
 - √ Recession and economic situation
 - √ Energy savings and efficiency measures
 - √ Structural changes of the industry sectors
 - Shift to less gas-intensive sectors
 - √ Technological improvements
 - Less gas used in production process
 - √ Saturation of the market in many countries
- GDP recovery and lower gas prices => **small growth possible in a few markets**
 - √ => Germany and in Central/Eastern/Southern Europe (incl. Turkey), unlikely elsewhere
- **At the regional level: flat or in decline**



The next 5-10 years: residential sector

- Most unpredictable year-on-year
 - ✓ Large annual / seasonal variations
- Key issues limiting gas demand growth:
 - ✓ Peaked 2010
 - ✓ Rise in gas prices to households contributed to lower (suppress?) demand
 - Decoupled from income growth, this will accelerate
 - Already decoupled from population growth/living space
 - ✓ Energy efficiency measures => low process, but already lower demand
 - ✓ Heat decarbonisation => probably post 2030, but already started and public acceptance of gas vs renewables should not be underestimated
 - ✓ Renewables will (also) increase in the residential (and industrial) heating: utilities to increase the renewable energy share in their EU heating and cooling sales by 1%/y from 2021 to 2030
 - ✓ Decentralised generation => hard to estimate, but growing factor
- **No growth expected**, except maybe in a few countries like Turkey, but seasonal variations to remain

The next 5-10 years: transport sector

- Level of awareness of the damage caused by atmospheric pollution continues to increase
 - Diesel bans are planned/proposed in several cities
- Uncertainty for passenger vehicles
 - Electric vehicles preferred
- Most activity is likely to occur in the marine and HGV sectors
 - October 2016: Implementation of IMO 0.5% global cap on sulphur content in marine fuels
 - => positive for new build LNG vessels in all markets
 - => new bunkerships being built, small scale bunkering at terminals including floating bunkering facilities, etc.
- Rail is seen as a potential market but volumes are small
- **Fastest growth rate**, but:
 - From a low base, new market to develop
 - Large potential for LNG in marine, but this is likely to be slow



Conclusions: the next 5-10 years are/may be different from the 'future of gas' debate

- 2015 / 2016 growth: not necessarily a sign of recovery
 - √ Weather, coal plants closures, nuclear/hydro problems, coal/gas prices
- The next 5-10 years: up or down ?
 - √ Black box or wide range of opinions, no consensus
 - √ Reasons to believe gas demand could stay high in this timeframe:
 - Power: coal to gas switching using existing gas plants could help alleviate CO2 emissions and replace firm capacity closures + fill in gaps (nuclear, hydro, renewables, coal...) + heating
 - Industrial gas demand: Some activity in key markets
 - Potential for transport, but will depend on political commitment and may be slower than this timeframe
 - √ VERY different outlook country by country !
- 2025+ / 2030+
 - √ Different debate: transition / destination, but on a different starting point?
 - √ Gas is a fossil fuel => role in a decarbonized economy ? Green gas / CCS ?

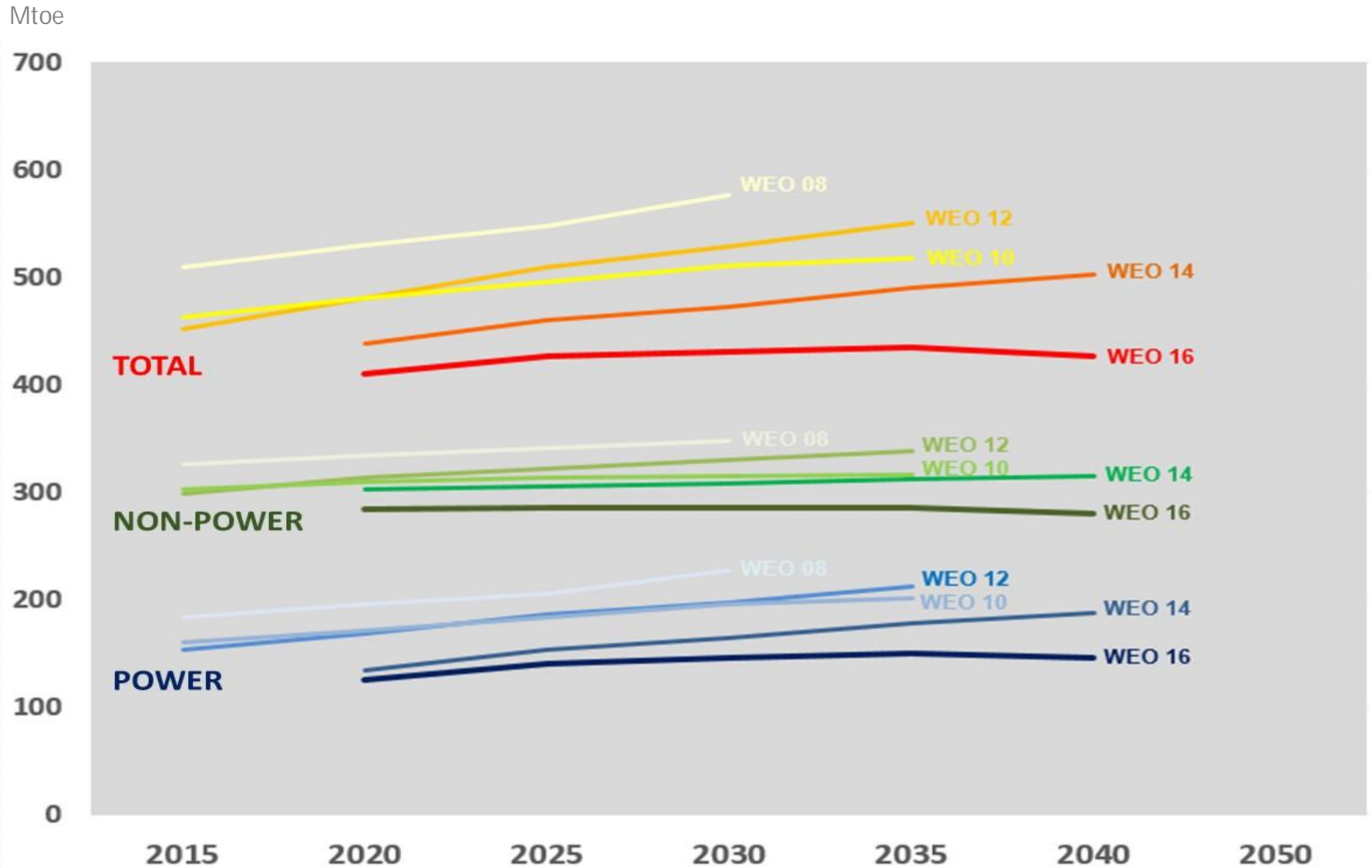


Thank you for your attention !

OXFORD ENERGY FORUM
Focus on natural gas demand
Forthcoming August 2017
www.oxfordenergy.org



Future of gas: the next 5-10 years 'black box'



Europe = OECD Europe

Sources: IEA, OECD Europe, reference scenario in WEO 2008, and new policies scenario in WEO 2010, WEO 2012, WEO 2014, WEO 2016