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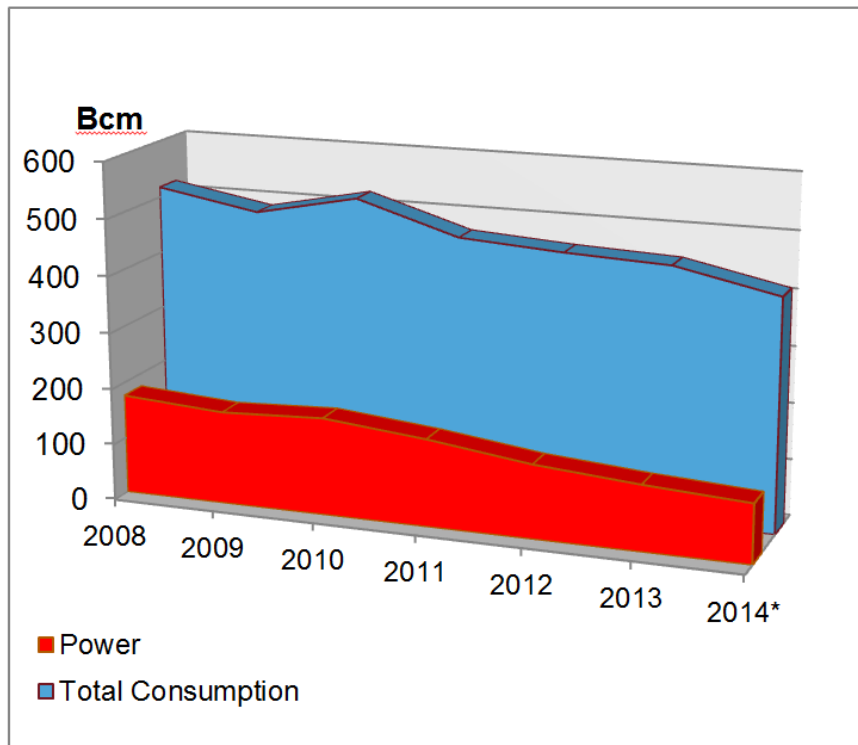
JANUARY 2015

GAS-FOR-POWER IN EUROPE: CHALLENGES & PROSPECTS

Fifth Gas Centre Industry Forum
United Nations Economic Commission For Europe (UNECE)

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EU 28: Power Sector Gas Consumption in Decline



**Total
Consumption
(EU-28)**

**↓ 13.27%
(68.7bcm)**

(2008-2013)

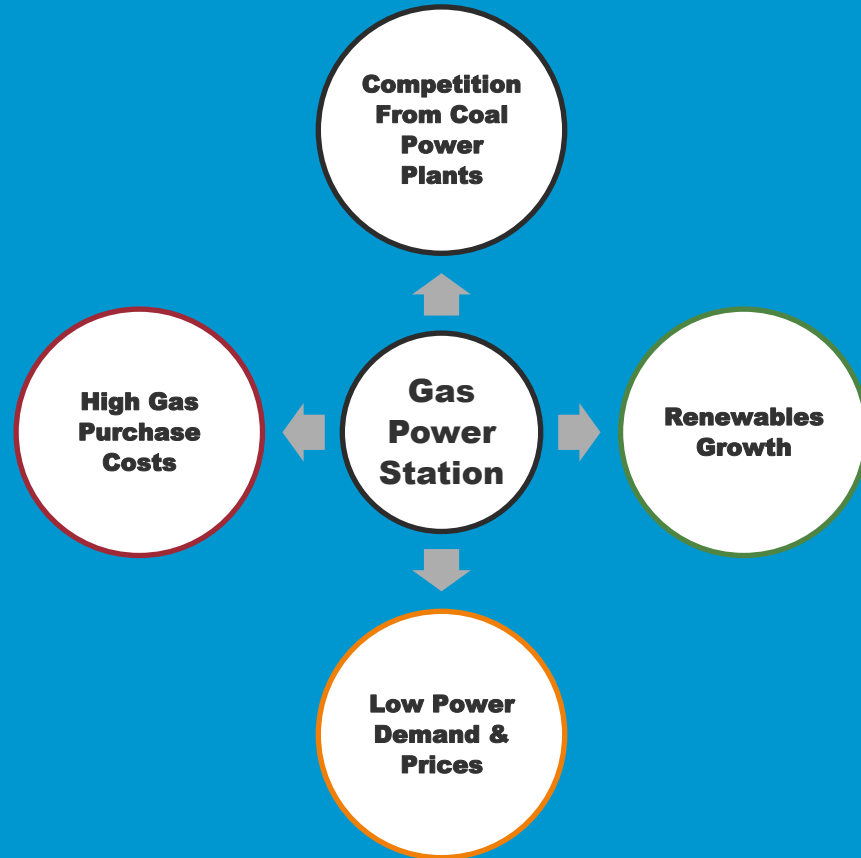
**Power Sector
Consumption
(EU-28)**

**↓ 34.35%
(60.4bcm)**

(2008-2013)

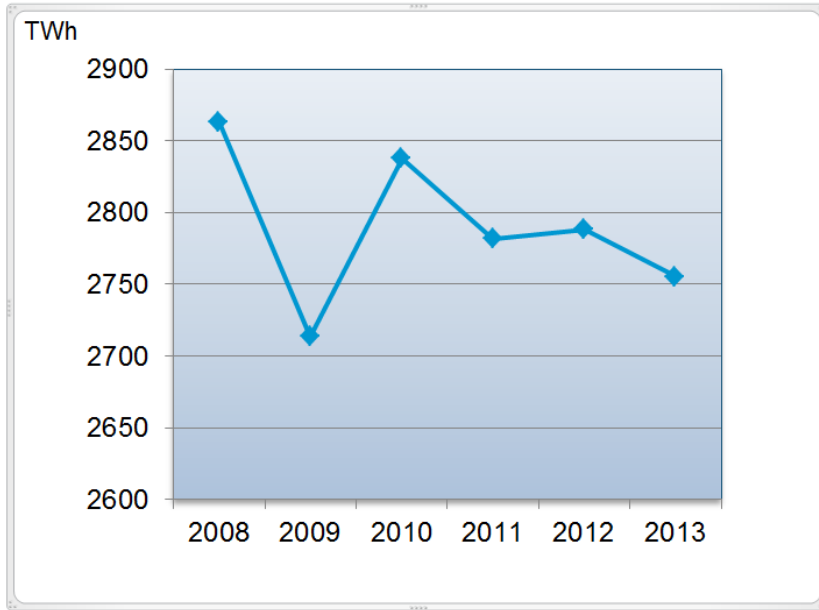
- The power sector has been a key driver of the decline in total EU-28 gas consumption since 2008.
- IHS estimates that coal burn at power plants in the EU-28 only decreased by 5.48% from 2008-2013.

Why has power sector gas consumption declined sharply since 2008?

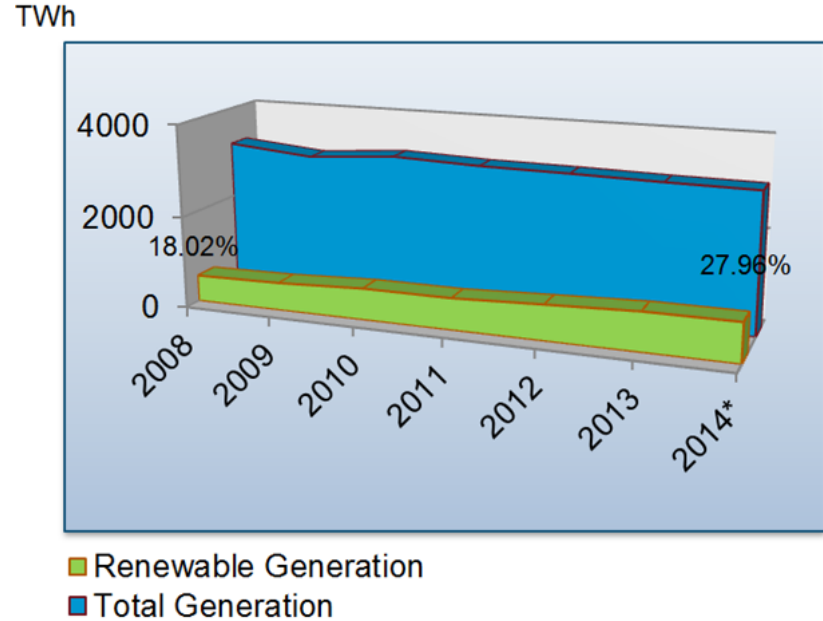


Electricity Consumption Decline + Renewable Growth = Reduced Residual Load for Gas Power Plants

**Final Electricity Consumption
(EU-28)**

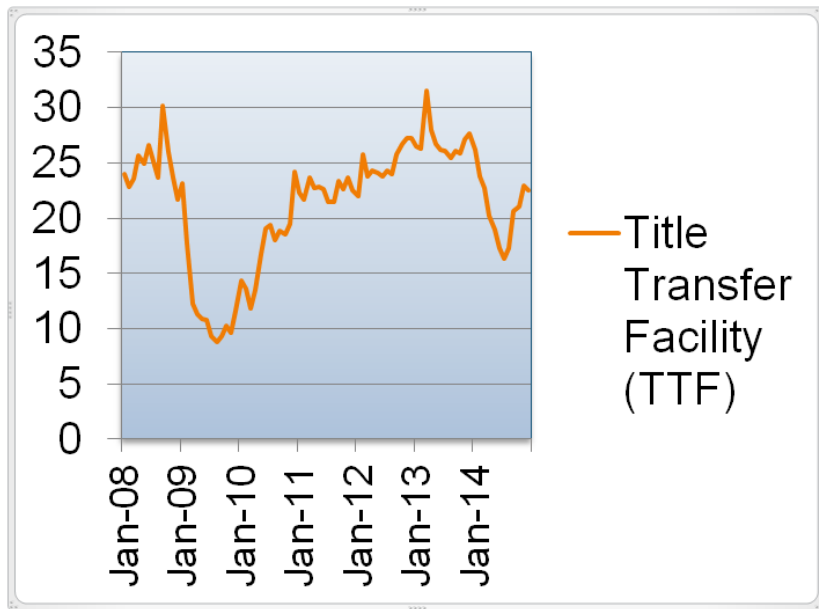


Renewables Rising (EU-28)

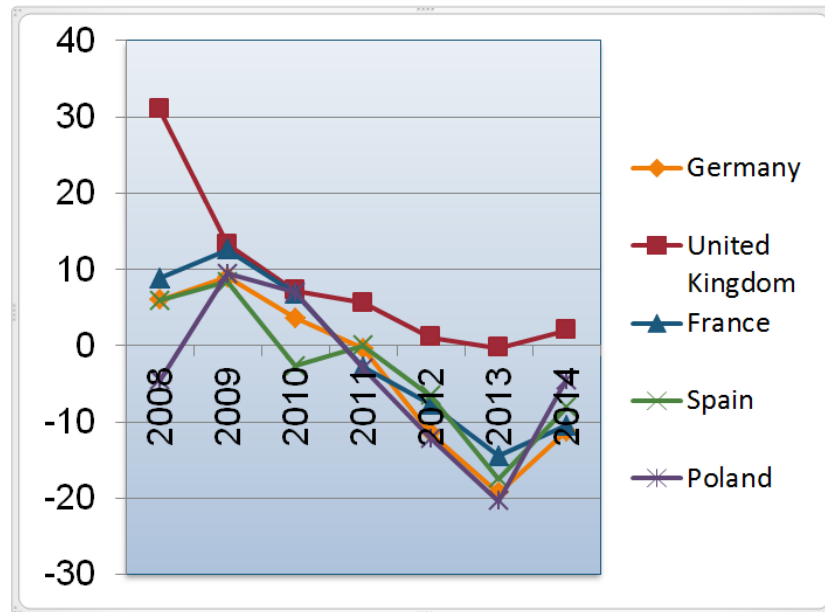


Resurgent Gas Prices Reduce Power Plant Profitability...

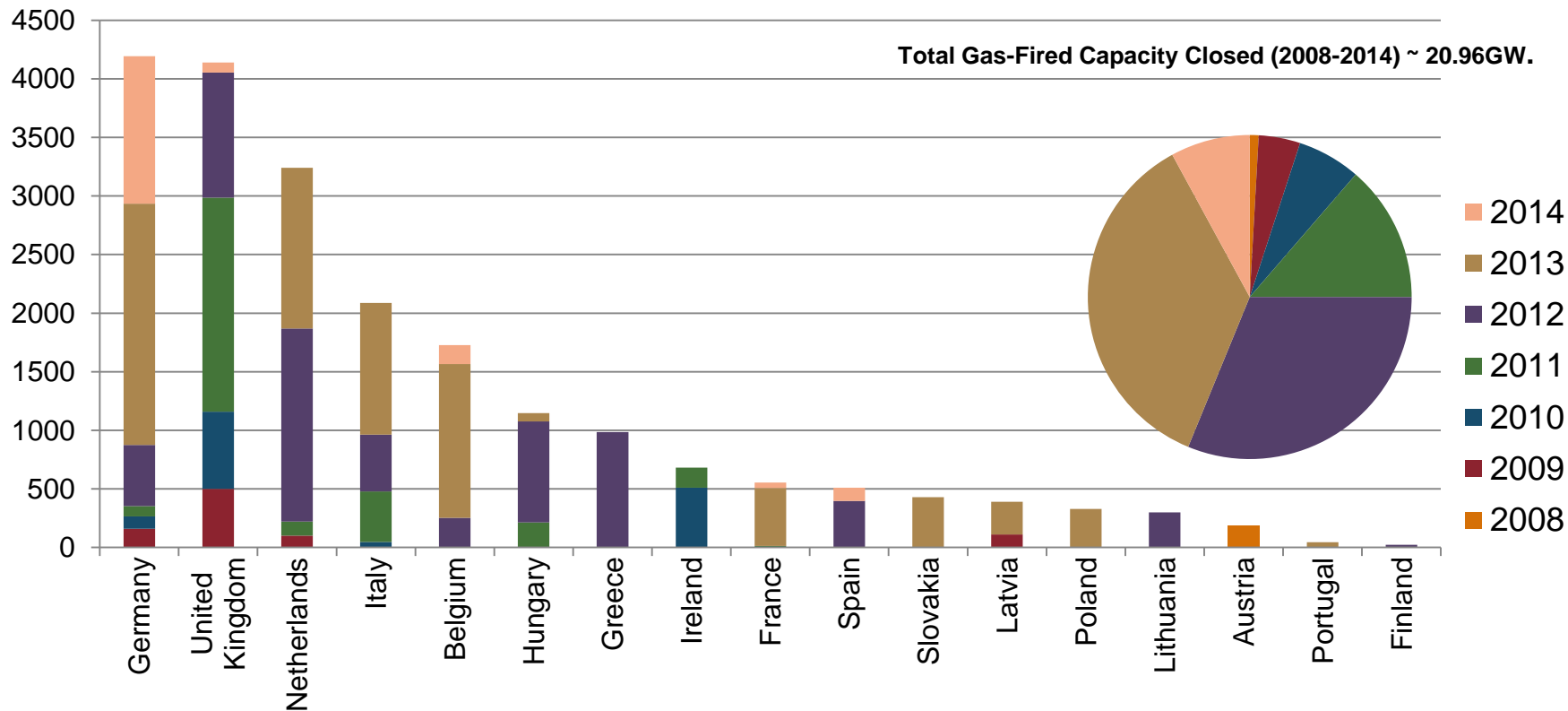
European Gas Prices (€/MWh)



Clean Spark Spreads (€/MWh)



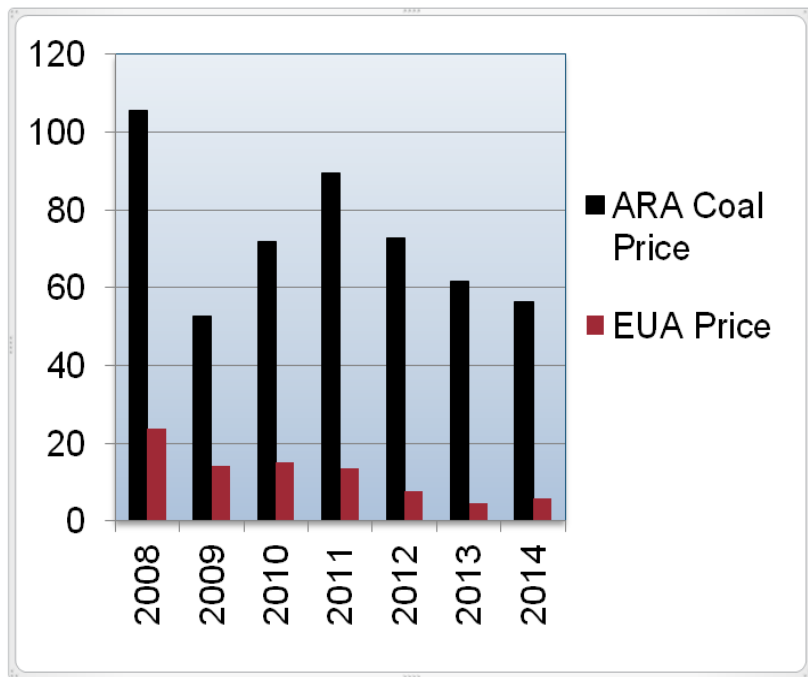
...Leading to Gas-Fired Capacity Closures



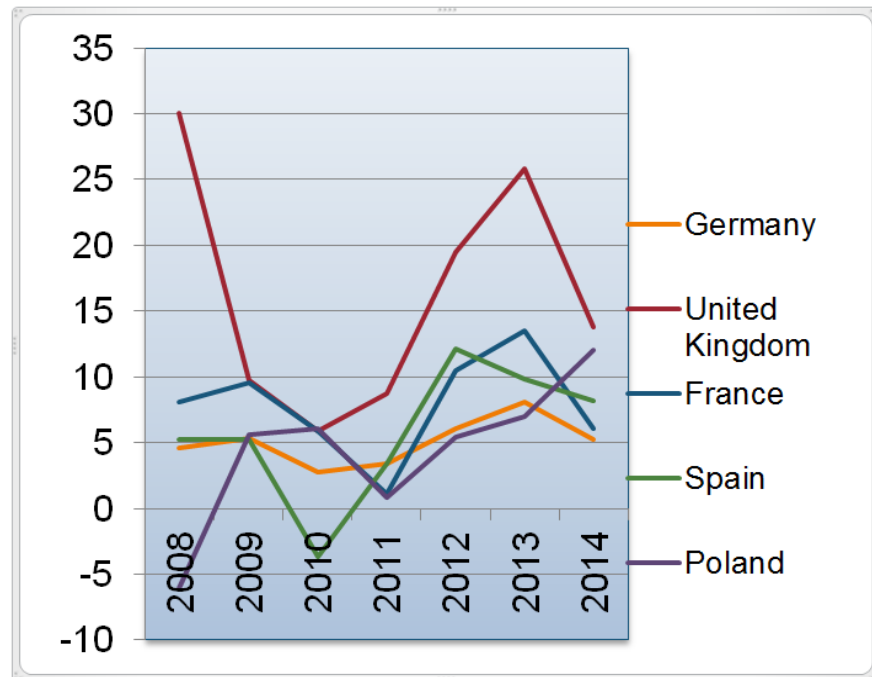
Source: IHS Midstream

Low Coal & Carbon Prices Favour Coal Power Plants Over Gas

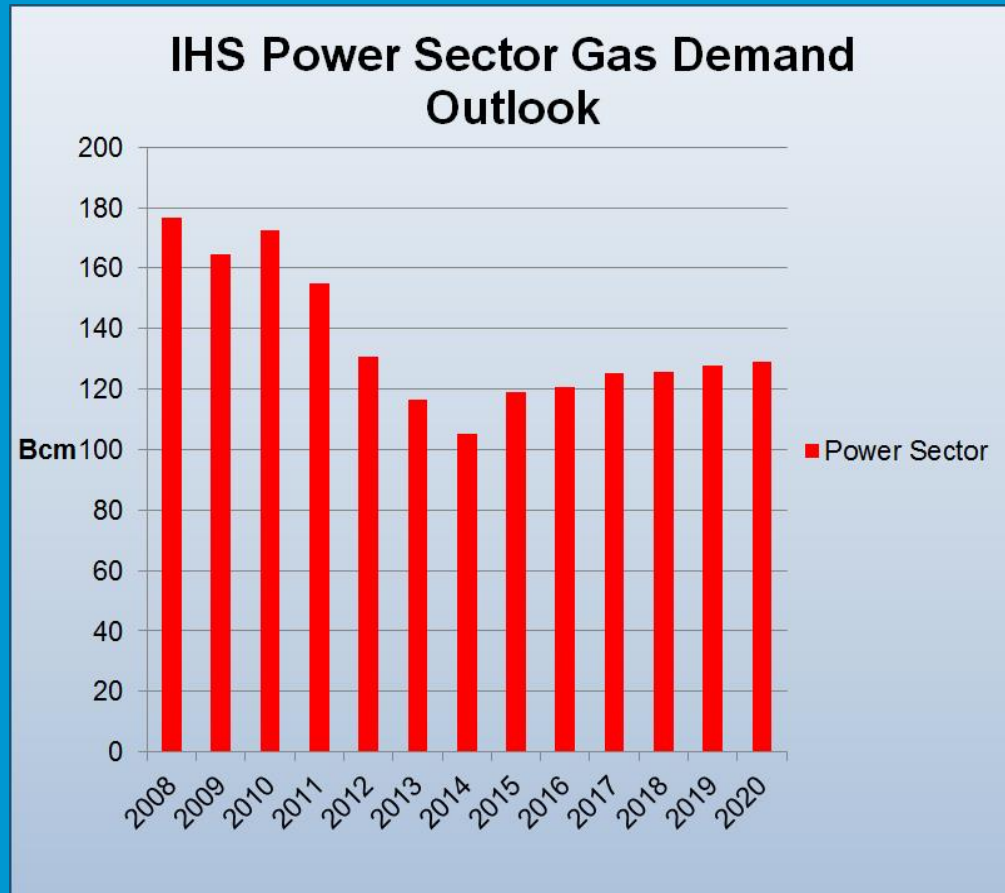
Coal & Carbon Prices (€/MetricTon)



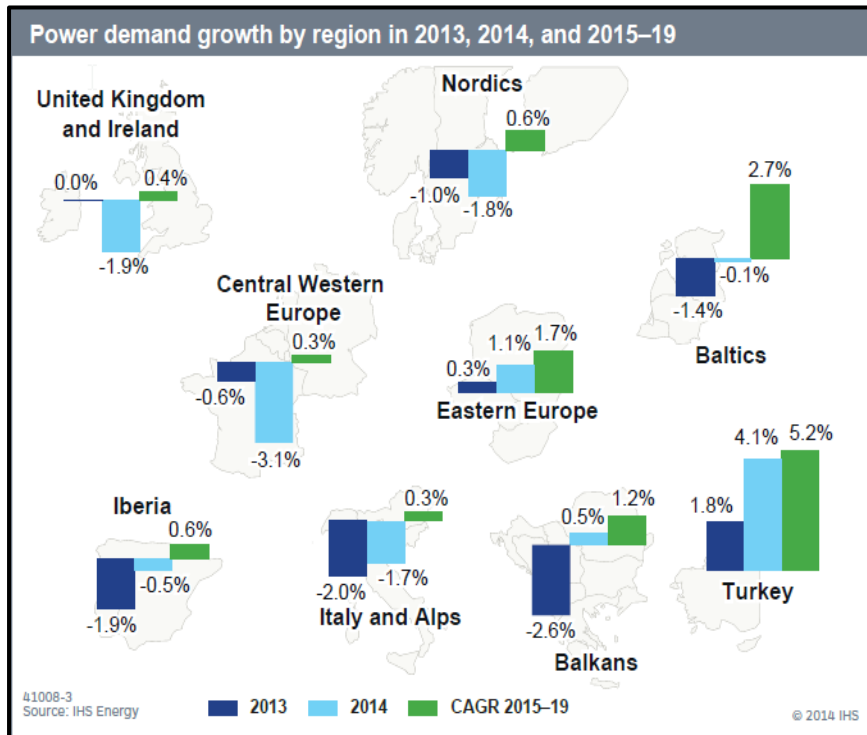
Clean Dark Spreads (€/MWh)



Will EU-28 power sector gas demand recover to 2008 levels by 2020?

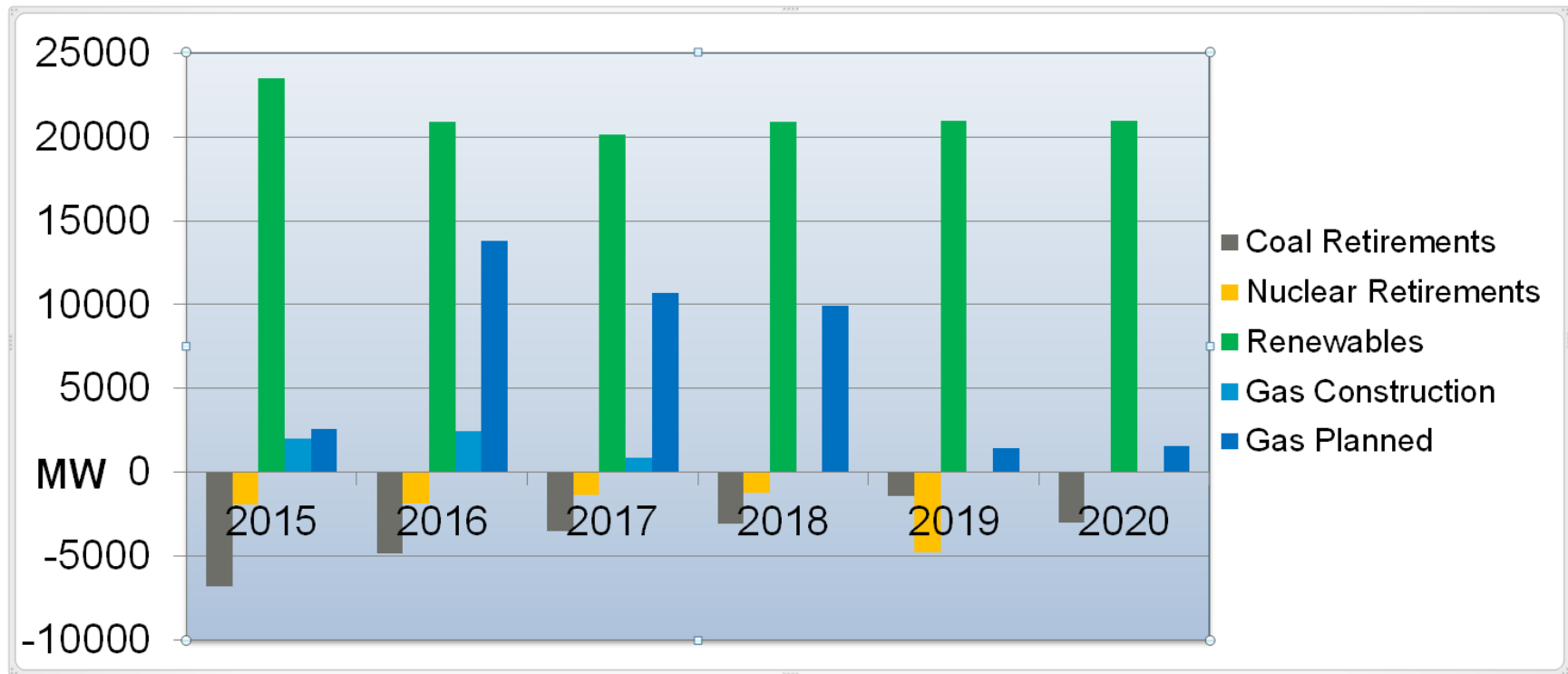


Low European Power Demand Outlook To Maintain Pressure on Gas Power Plants

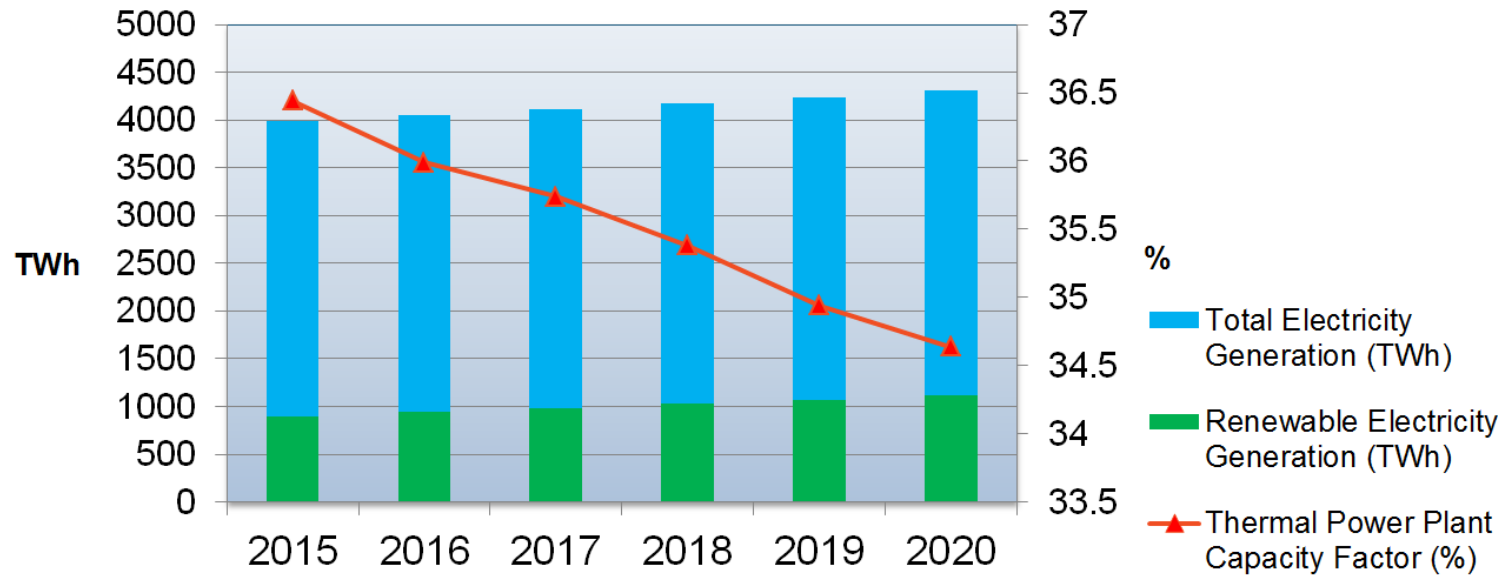


- IHS Energy expects power demand in the EU-28 to grow at an average of 0.6% per year from 2015-2019.
- Low GDP growth in EU-28 economies to slow industrial power demand recovery.
- Moderate declines in residential power demand due to energy efficiency improvements.
- Low power demand growth will contribute to lower operating hours and lower revenues for gas power plants.

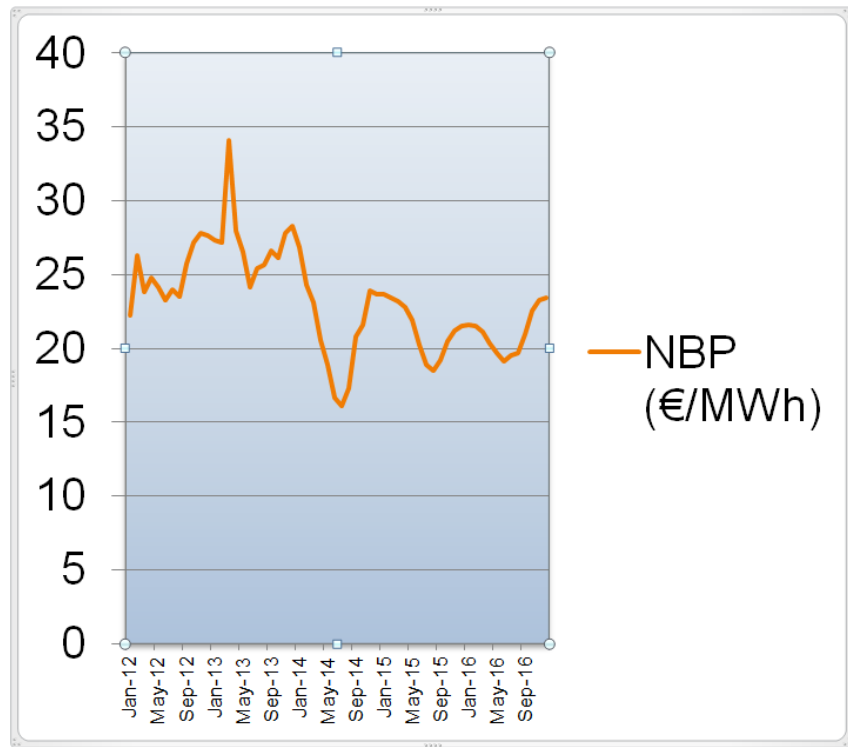
Limited Opportunities for Gas Power Plants From Coal & Nuclear Retirements



Renewables Generation Growth Will Lower Capacity Factors at Fossil Fuel Power Plants in Europe



Gas Prices To Moderate, Triggering Coal-to-Gas Switching in the UK



- Gas price moderation in Europe is linked with low gas demand, fall in oil prices and boost in global LNG supplies.
- Increase in the Carbon Price Support (CPS) rate in the UK to GBP 18.08 per tonne of CO₂, to switch merit order from coal to gas in April 2015.
- Potential for an increase in power sector gas consumption of up to 10bcm per year.

Capacity Mechanisms To Boost Revenues for Gas-Fired Capacity in Selected Power Markets

UK Capacity Market Auction Results

Plant Type	Capacity Awarded (MW)	Capacity %
Combined Cycle Gas Turbine	22,258.651	45.19%
Combined Heat and Power	4,235.068	8.6%
Coal/Biomass	9,232.183	18.74%
Demand Side Response	174.170	0.35%
Hydro	682.162	1.38%
Nuclear	7,876.108	15.99%
Open Cycle Gas Turbine Reciprocating Engines	2,101.223	4.27%
Storage	2,699.373	5.48%

Capacity mechanisms unlikely to drive power sector gas demand recovery by 2020

Because...

1. Implementation of capacity mechanisms is geographically constrained & implementation will be gradual.
2. Older gas plants not contracted under capacity mechanisms still face closure threat.
3. Amount of capacity that will be contracted under capacity mechanisms will decrease over time.

Gas-For-Power in Europe: Difficult Road Ahead

- Challenging market conditions account for the fall in gas-burn at power plants in the EU-28 since 2008.
- Year-on-year contractions in power sector gas consumption to stop in 2015 on coal-to-gas switching in the UK & modest economic growth recovery.
- Sombre medium term outlook for gas-to-power in EU-28 on low electricity demand environment and continued renewables growth.
- IHS Energy forecasts that power sector gas consumption in the EU-28 will not return to 2008 levels by 2020.