

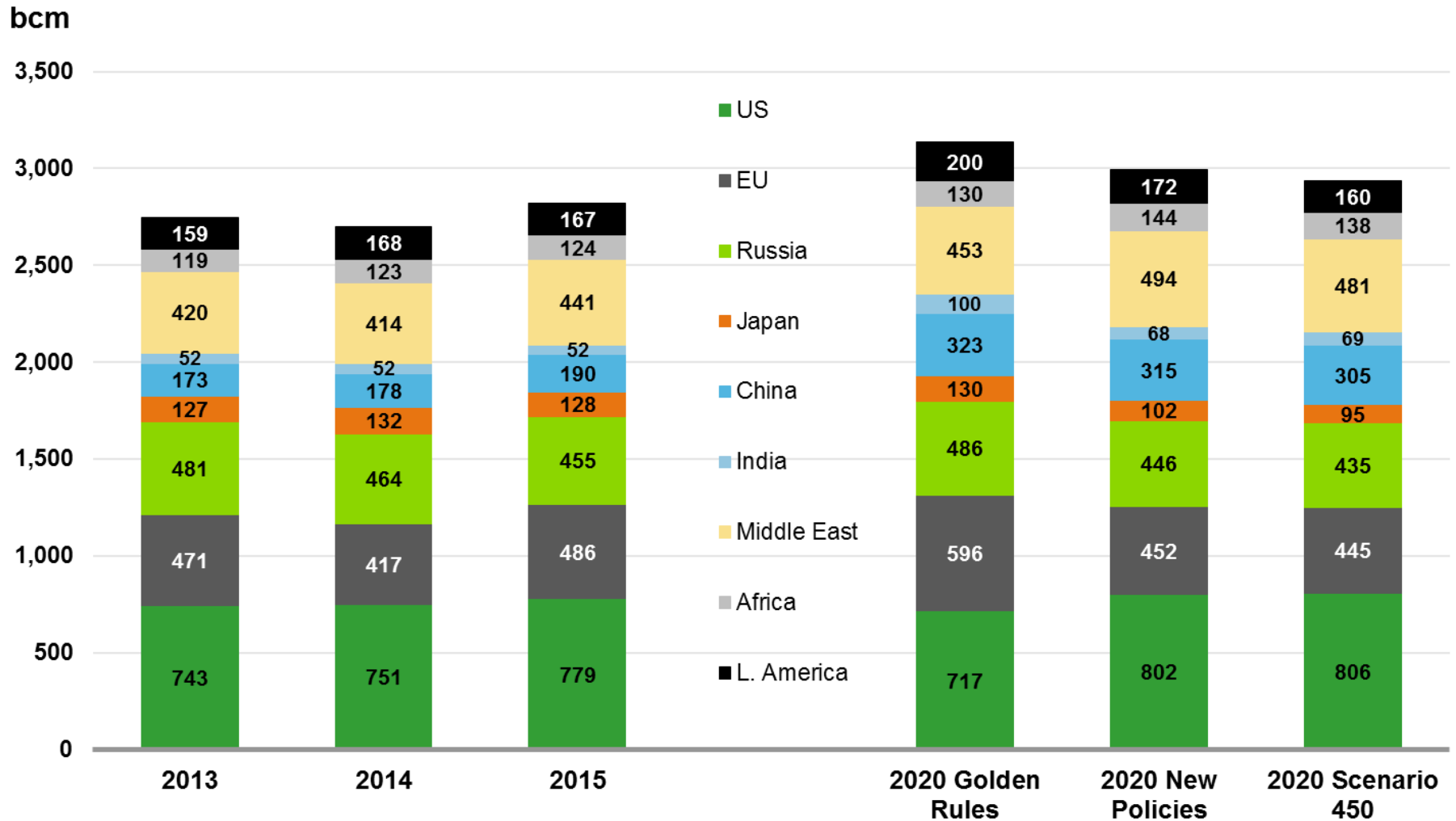
14/10/2016

Roadmap to Gas Golden Age

International Business Conference

Stéphane FERDRIN

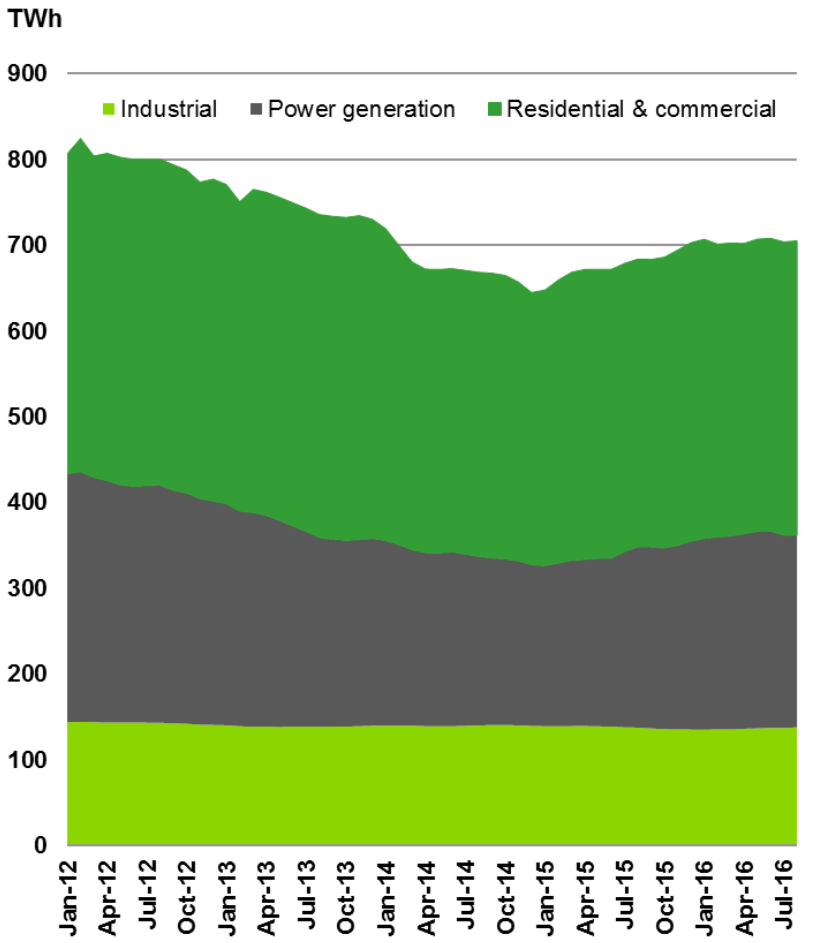
GAS CONSUMPTION FORECASTS ARE BELOW IEA'S GOLDEN AGE TARGETS



Sources: @OECD/IEA, WEO 2015 – Credit Agricole SA / ECO

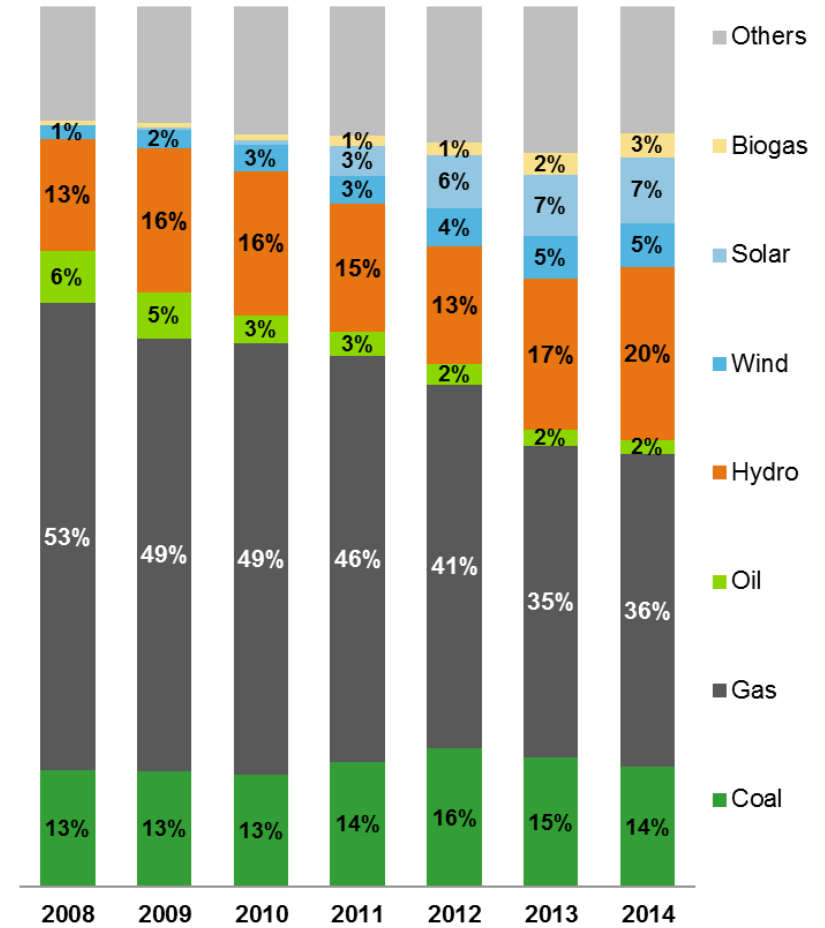
IN ITALY, RENEWABLES DISPLACE GAS AS ENERGY SOURCE FOR POWER GENERATION

Gas consumption (12-month trailing)



Source: Snam Rete - Credit Agricole SA / ECO

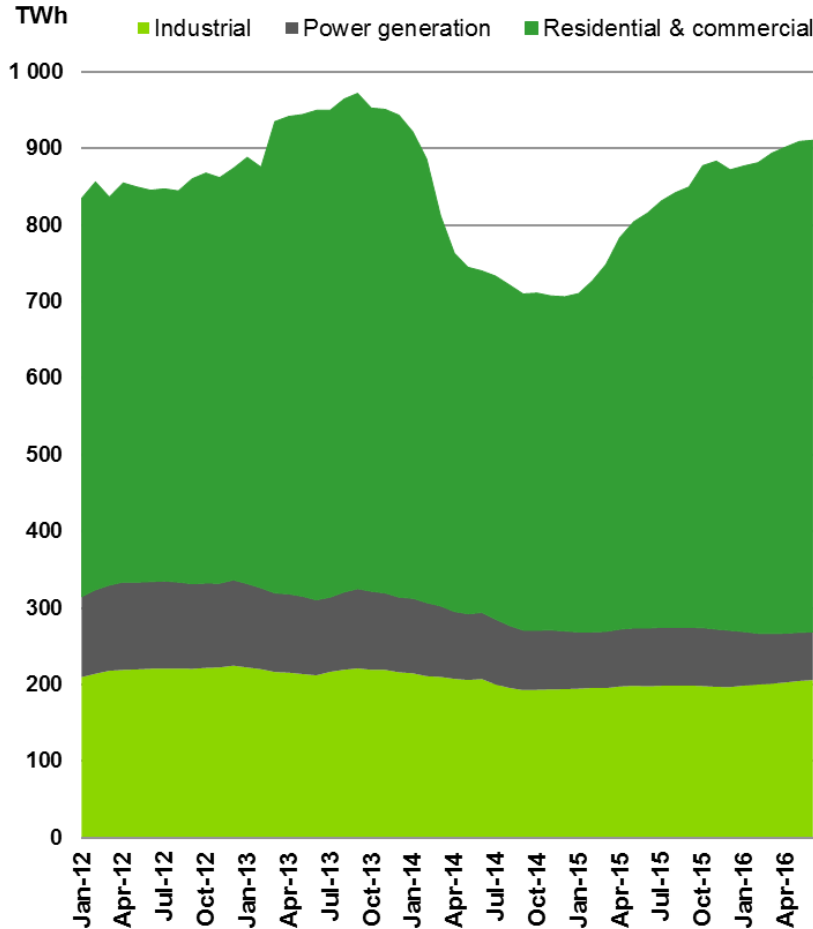
Power generation mix



Source: Terna - Credit Agricole SA / ECO

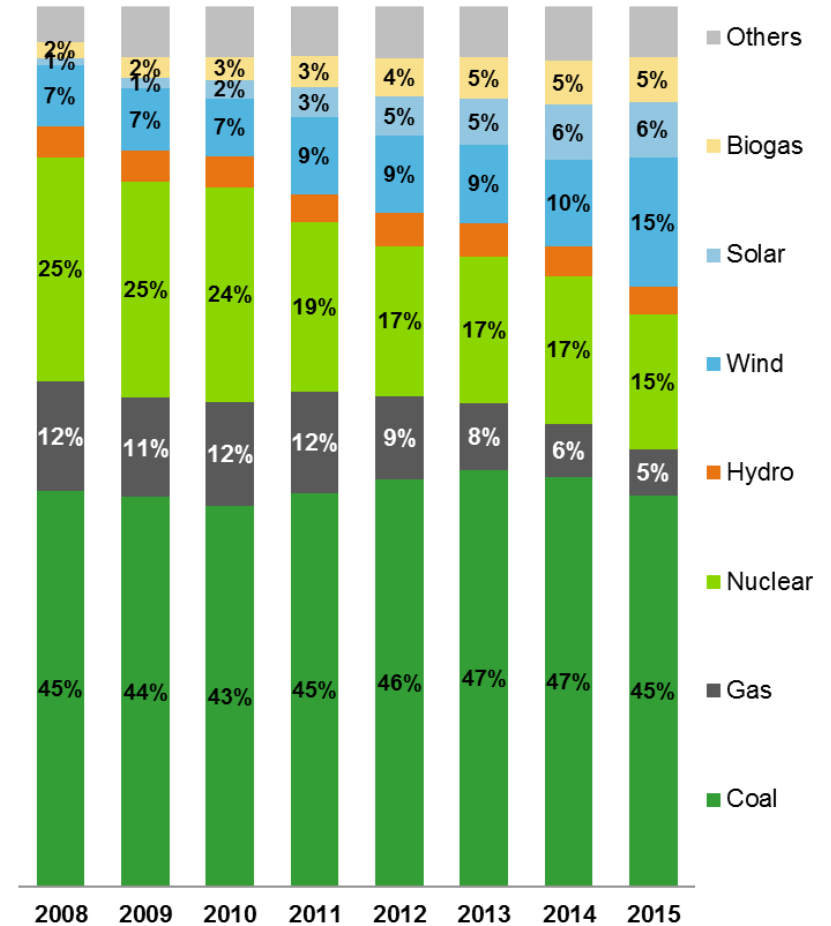
IN GERMANY, GAS IS LOOSING GROUND TO COAL AND RENEWABLES

Gas consumption (12-month trailing)



Source: Credit Agricole SA / ECO

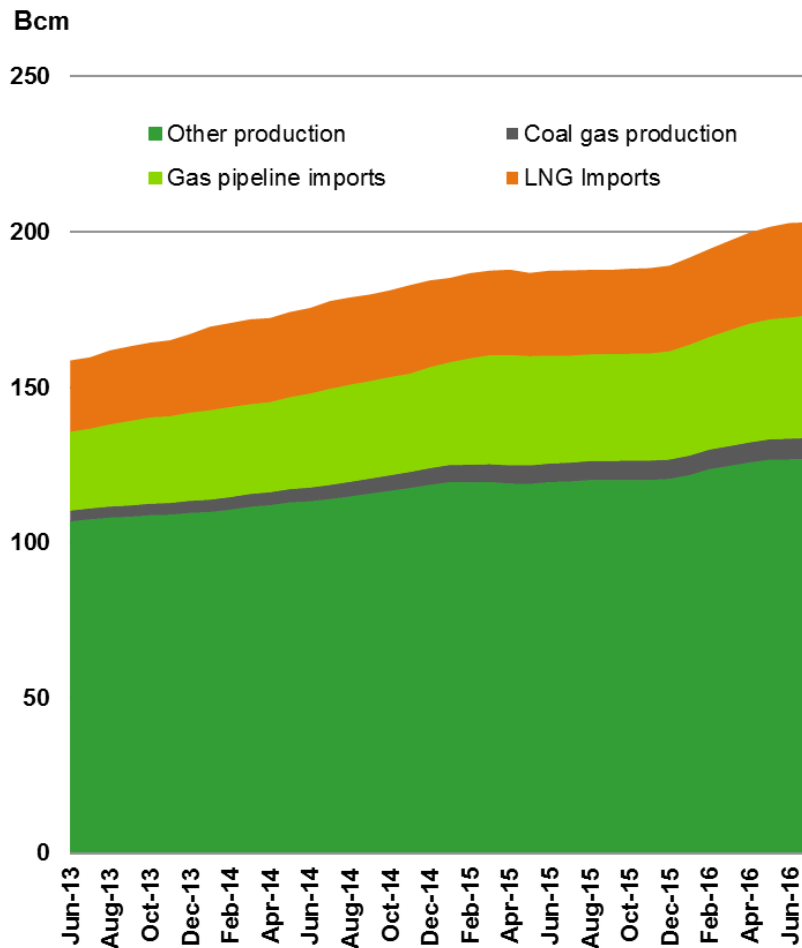
Power generation mix



Source: Crédit Agricole SA / ECO

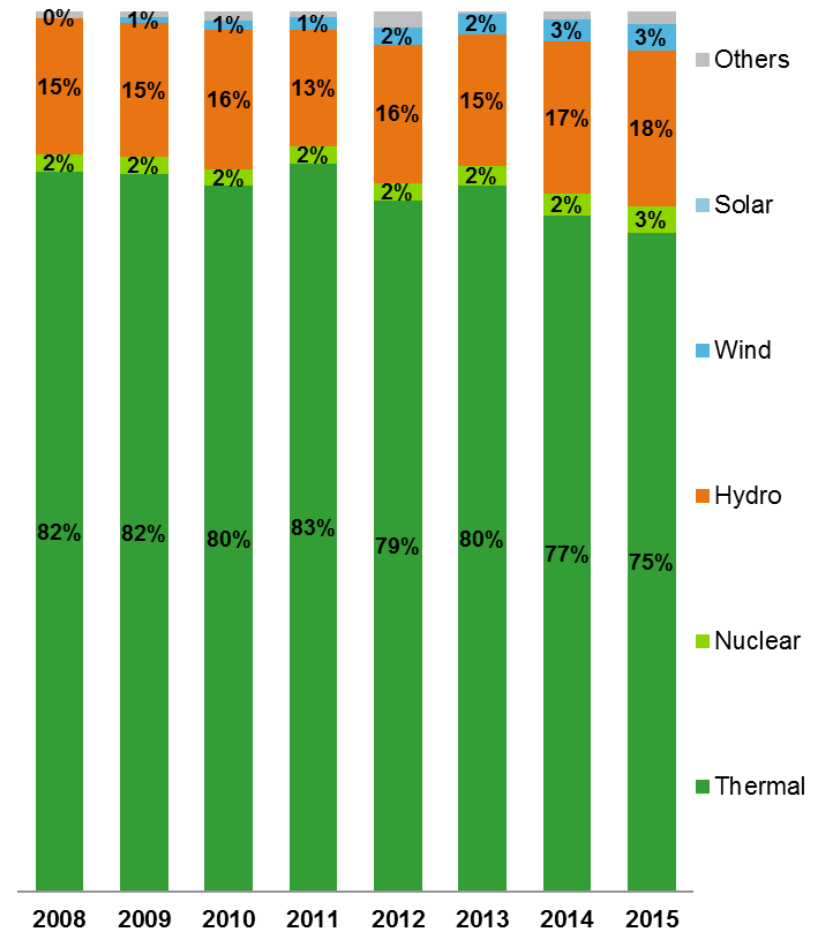
NATURAL GAS POTENTIAL IN CHINA IS IMPORTANT BUT NON-CARBON ENERGIES ARE GROWING

Gas supplies (12-month trailing)



Source: Crédit Agricole SA / ECO

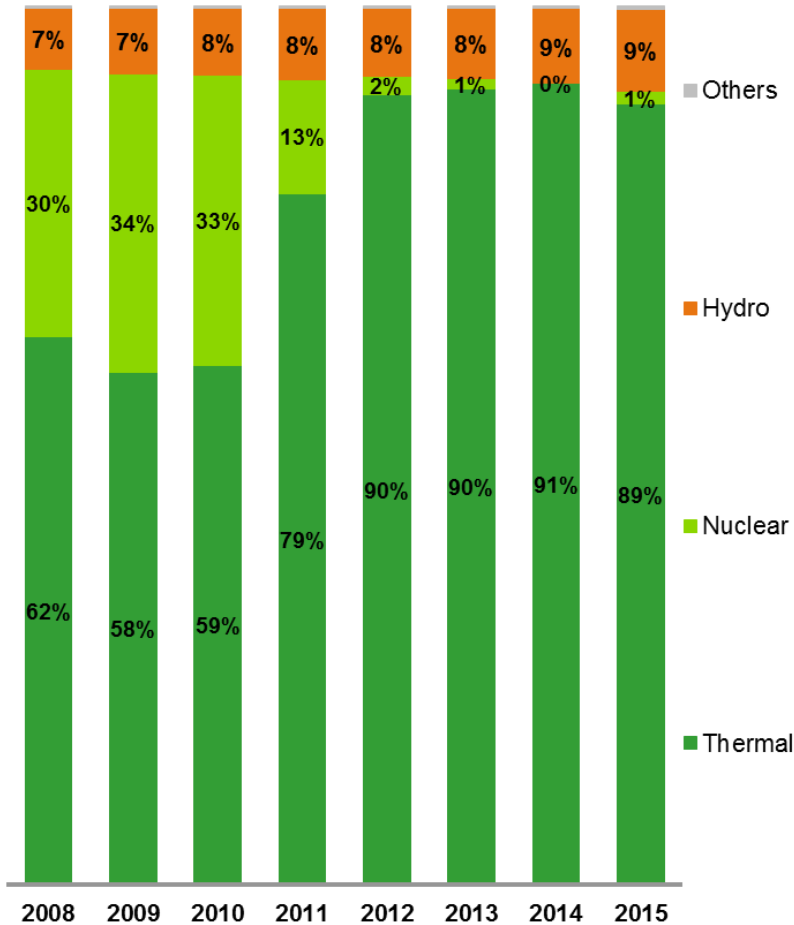
Power generation mix



Sources: National Bureau of Statistics of China – Crédit Agricole SA / ECO

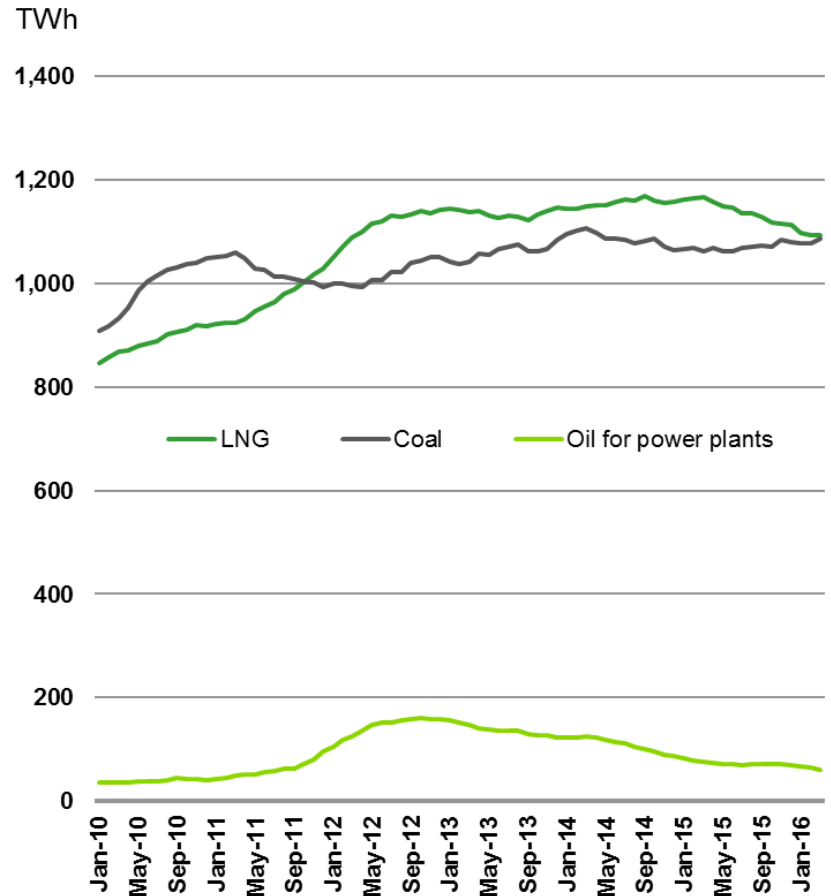
IN JAPAN, EXPENSIVE LNG SUPPORTED COAL CONSUMPTION FOR POWER GENERATION

Power generation mix



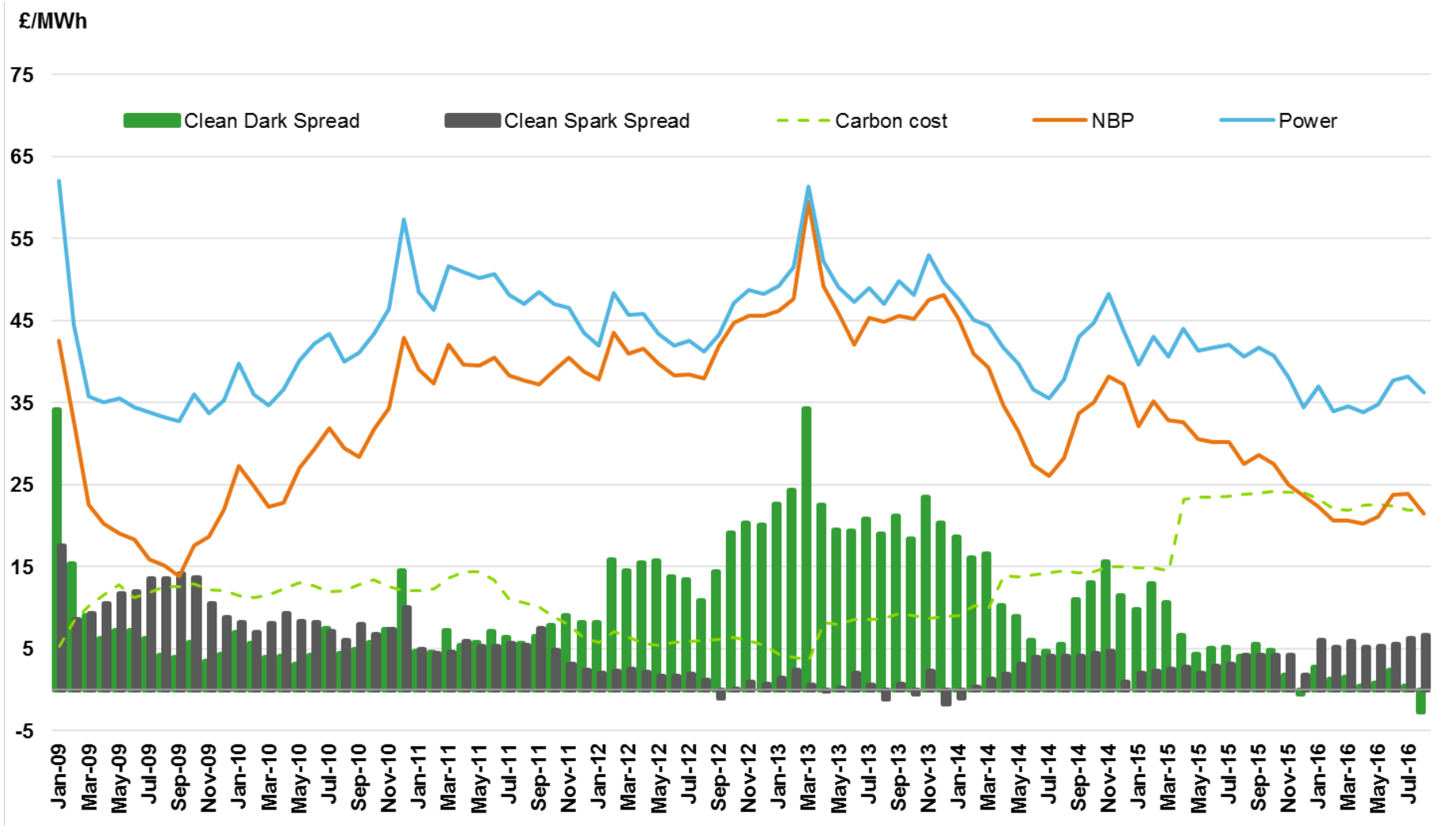
Source: FEPC - Credit Agricole SA / ECO

Fossil fuel imports (12-month trailing)



Source: Credit Agricole SA / ECO

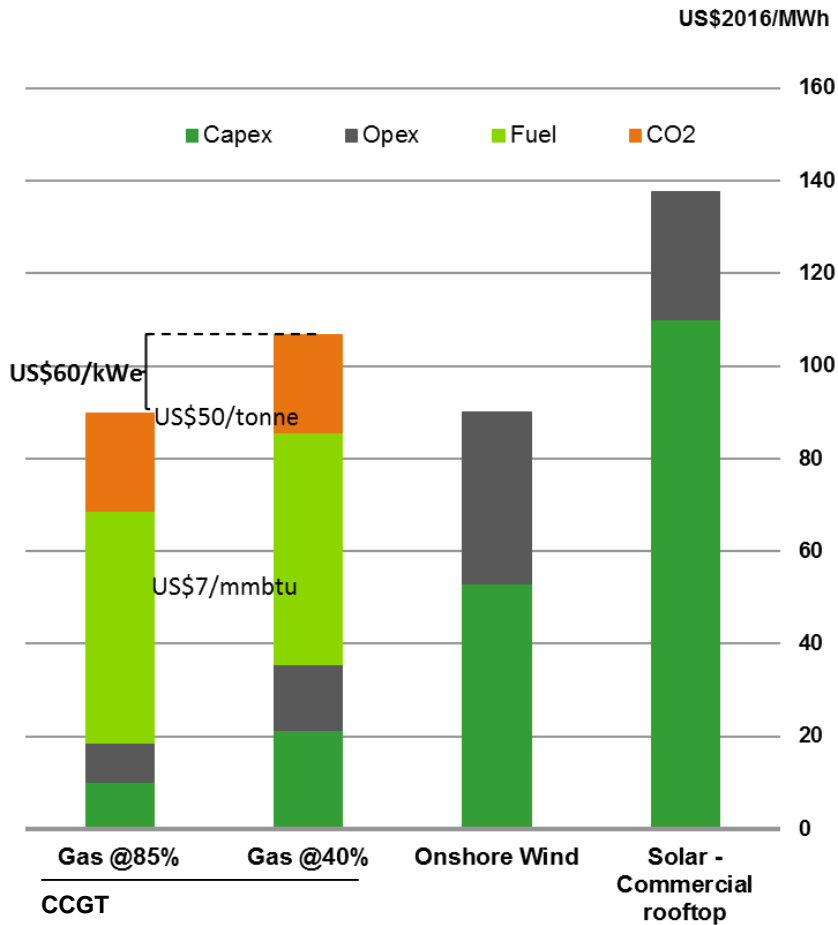
IN THE UK CARBON TAX AND LOWER GAS PRICE ARE RESULTING IN COAL TO GAS SWITCHING



Source: Credit Agricole SA / ECO

TO REMAIN COMPETITIVE NATURAL GAS FLEXIBILITY AND LOW FOOTPRINT SHOULD BE PRICED

Levelized cost of electricity in Germany



Source : Credit Agricole SA / ECO

1



Courtesy of General Electric

7HA02 gas turbine
 Combined cycle 500MW
 Stream factor : 85%
 Efficiency : 61%

≈ 695



V100-1.8MW turbine
 Assumed Stream factor : 34%

Courtesy of Vestas Wind System A/S

≈ 2,580

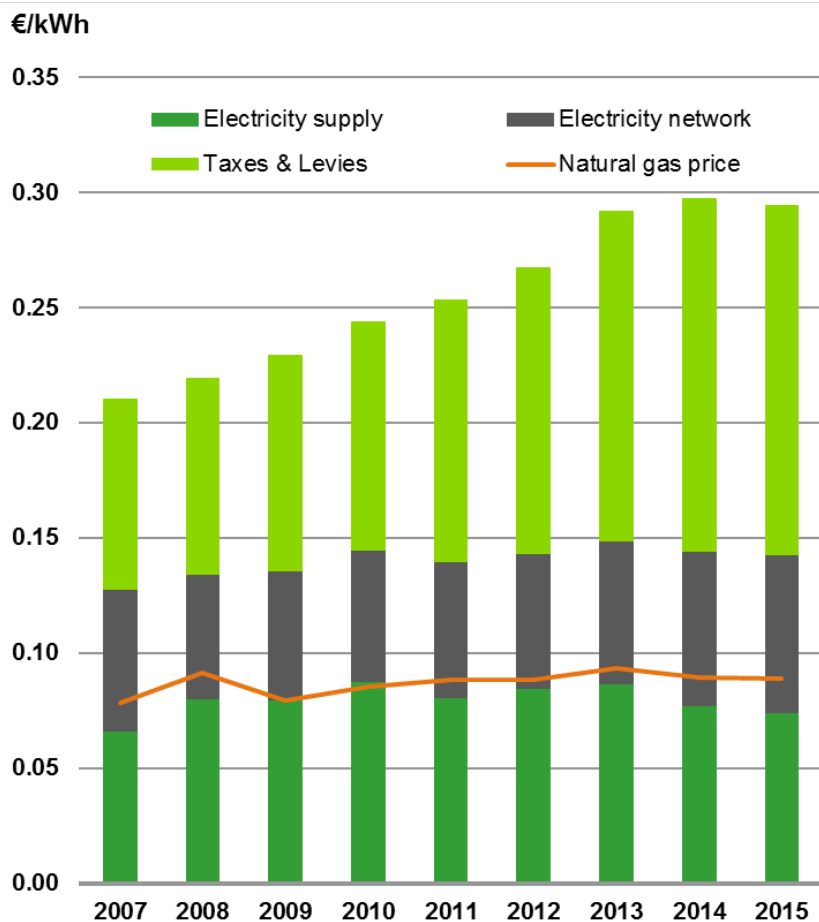


Commercial rooftops
 1515 kW
 Assumed Stream factor : 11%

Bloomberg JFK Airport - Courtesy of EnterSolar

FOR HEAT PURPOSE, NATURAL GAS IS MORE COMPETITIVE

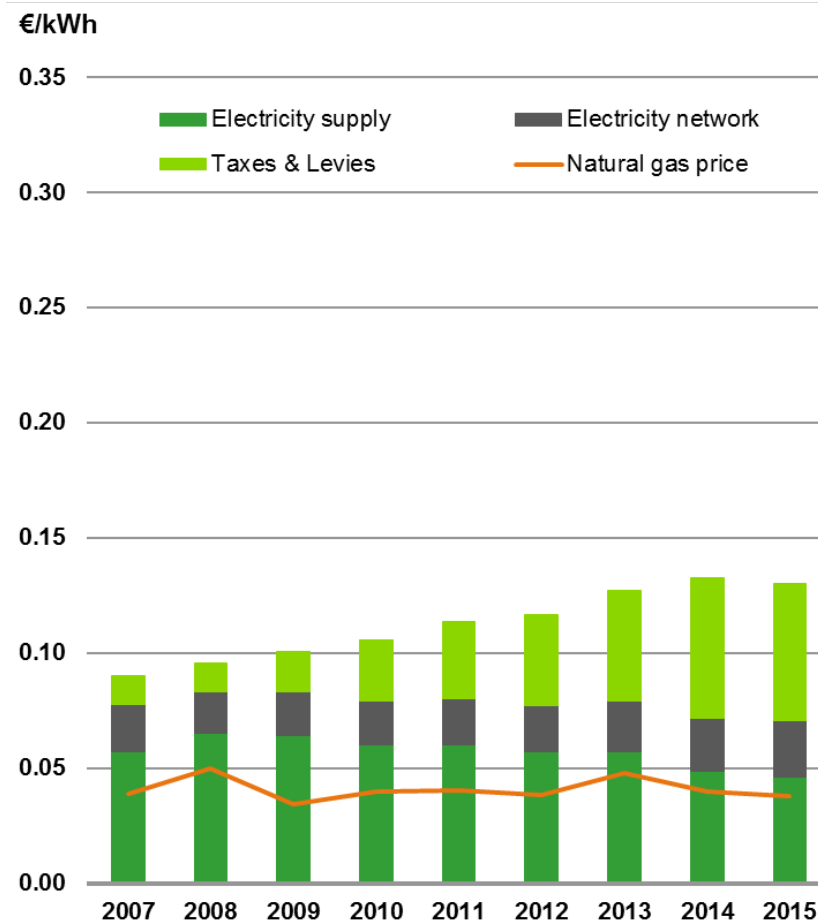
Electricity & gas retail prices for German Households⁽¹⁾



⁽¹⁾ Annual consumption between 2,500 and 5,000 kWh

Sources : Eurostat – Credit Agricole SA / ECO

Electricity & gas retail prices for German Industries⁽²⁾



⁽²⁾ Annual consumption between 2,778 and 20,000 MWh

Sources : Eurostat – Credit Agricole SA / ECO



CONCLUSIONS


- ✓ In the European power sector, gas lost market share to Renewables and cheaper coal
- ✓ In Asia natural gas will likely compete with the nascent development of renewables as a primary source of energy for power generation
- ✓ Achieving the IEA's targets of a "Golden Age of Gas" will be challenging, especially in Europe and Asia
- ✓ Natural gas can remain the bridge energy source for power generation but it supposes that :
 - Gas supplies are abundant and affordable,
 - Energy markets implement an efficient carbon pricing,
 - Gas-fired power plants are paid some kind of premium for bridging the gap between supplies of non-carbon power and demand,
 - Development of distributed batteries remain limited and do not displace gas as the bridging energy for power generation
- ✓ For heat purposes, gas is more competitive than electricity, but the sector should not be complacent because renewable sources of heat are investigated and being developed.



Q&A

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