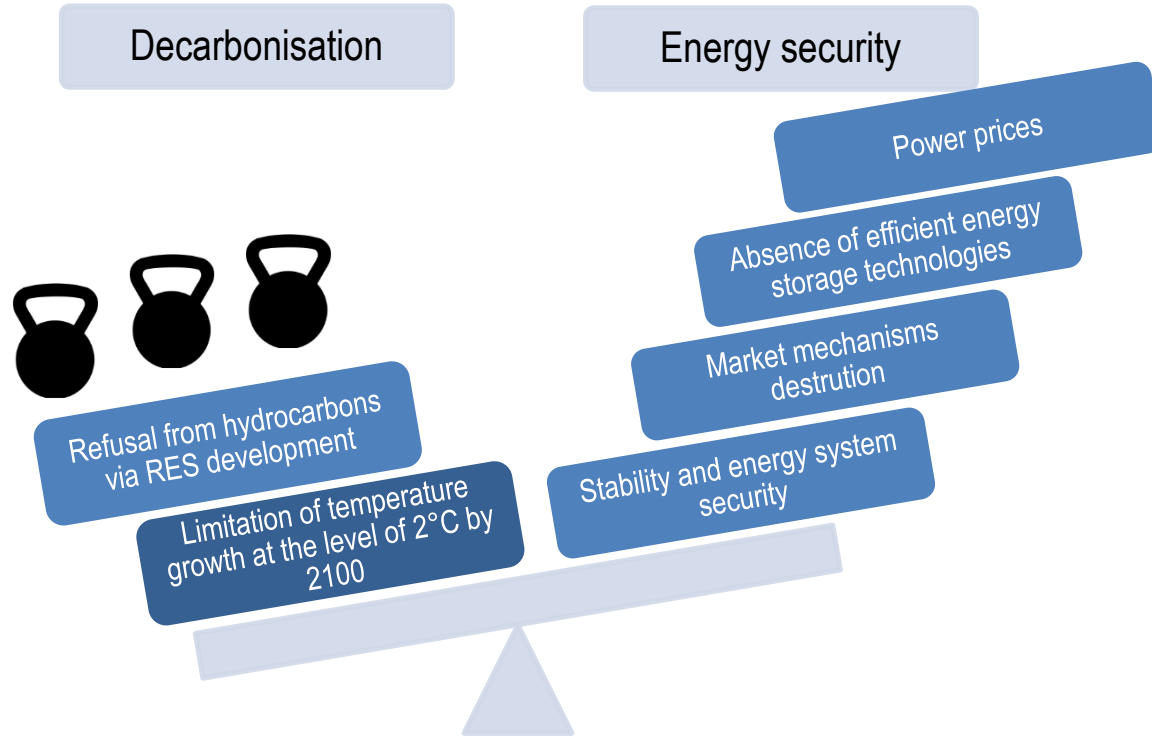


Policy of decarbonisation and energy security issues

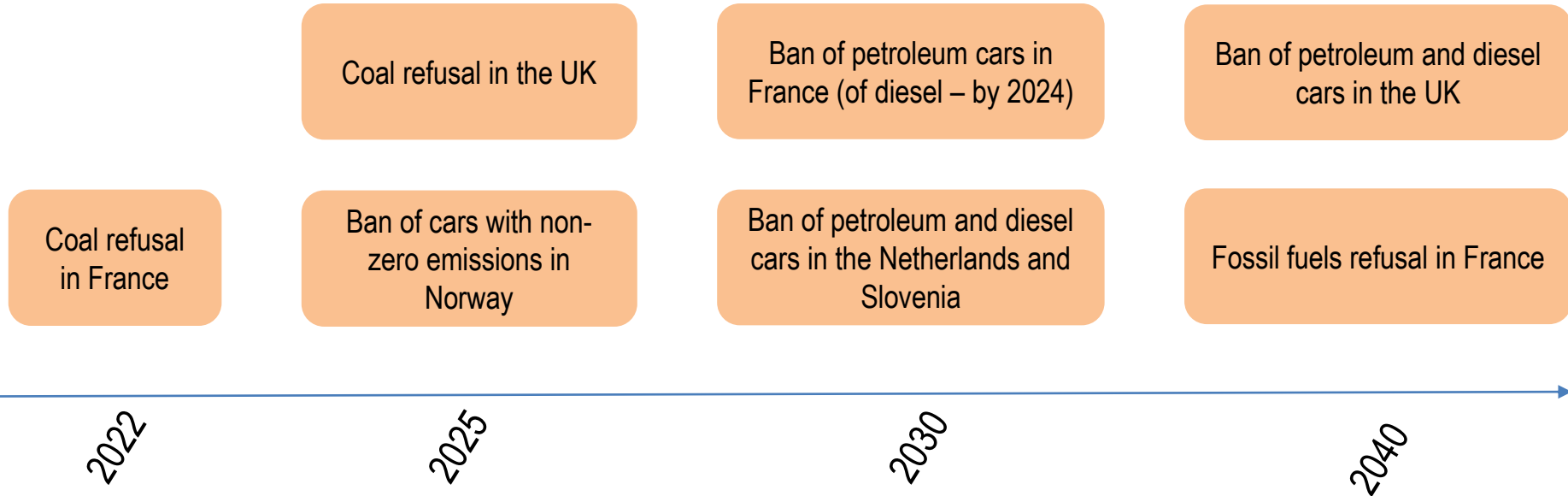
November 9, 2017

Leonid Loginov
Chief Specialist of Division of
European Gas Market Monitoring

Decarbonisation or energy security?

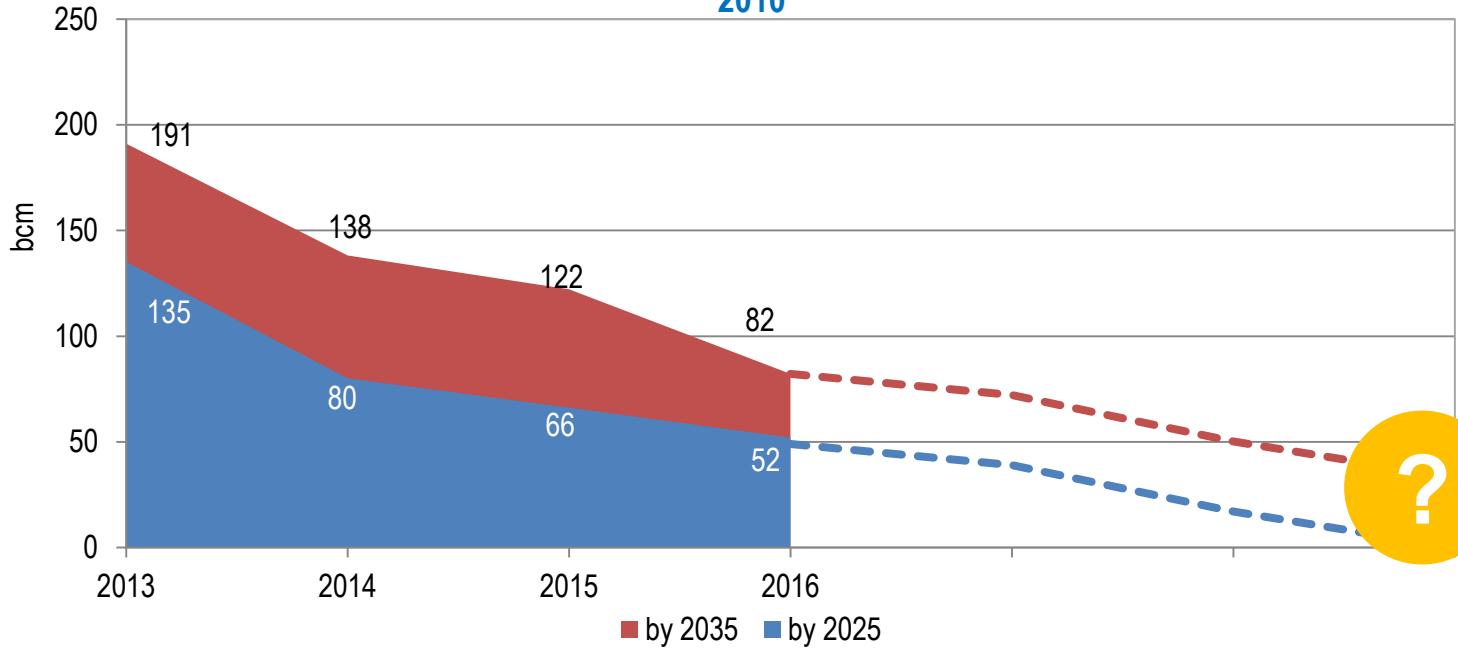


Stages of decarbonisation process



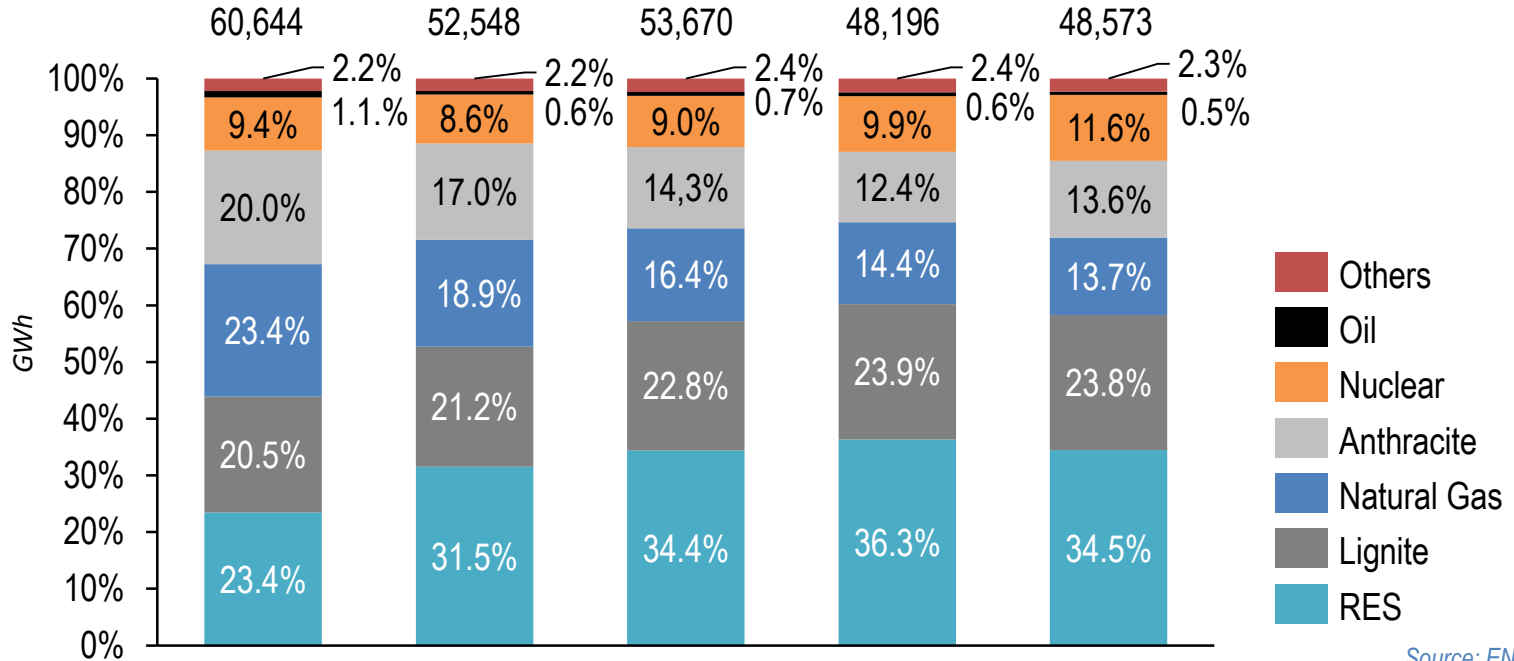
Consensus forecasts indicate diminishing interest to natural gas as a transit fuel in Europe

Additional demand for import gas in Europe by 2025 and 2035 compared with 2010



Each year forecasts of European consumption are downgraded, denoting lower demand for additional import gas in future.

Power Generation in Germany

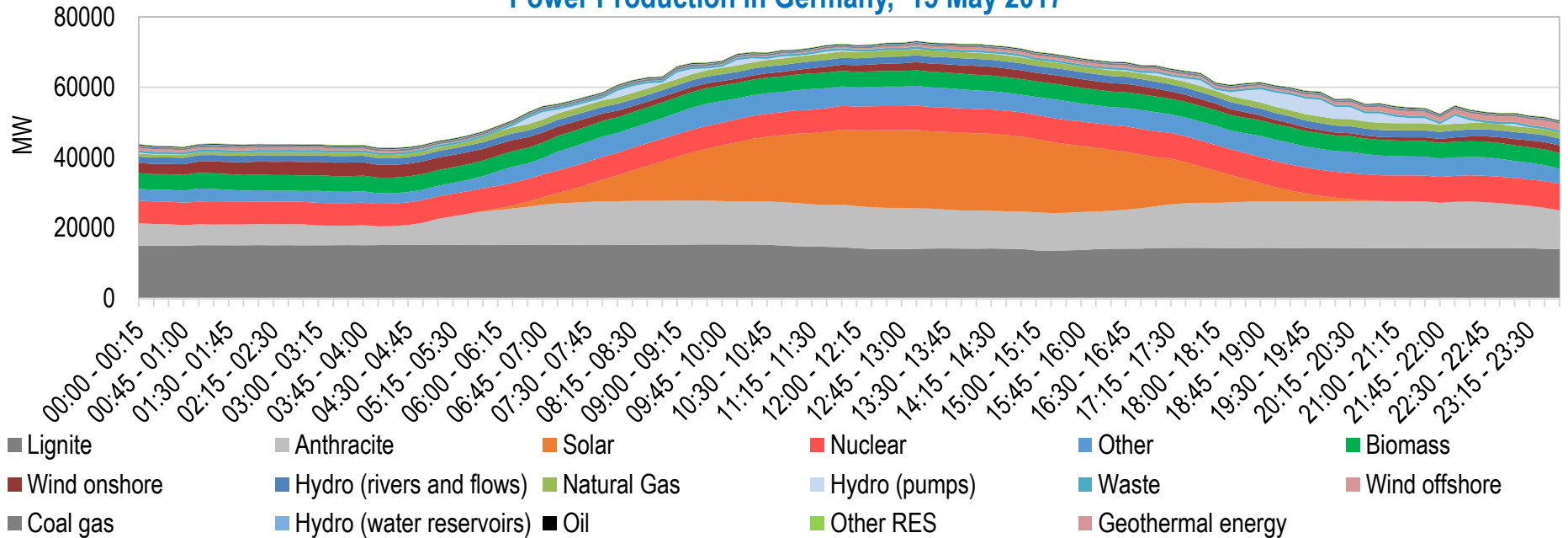


In 2017 average RES share in power generation was more than 30%

Source: ENTSOE.

Dependence of German Energy System on Weather Conditions

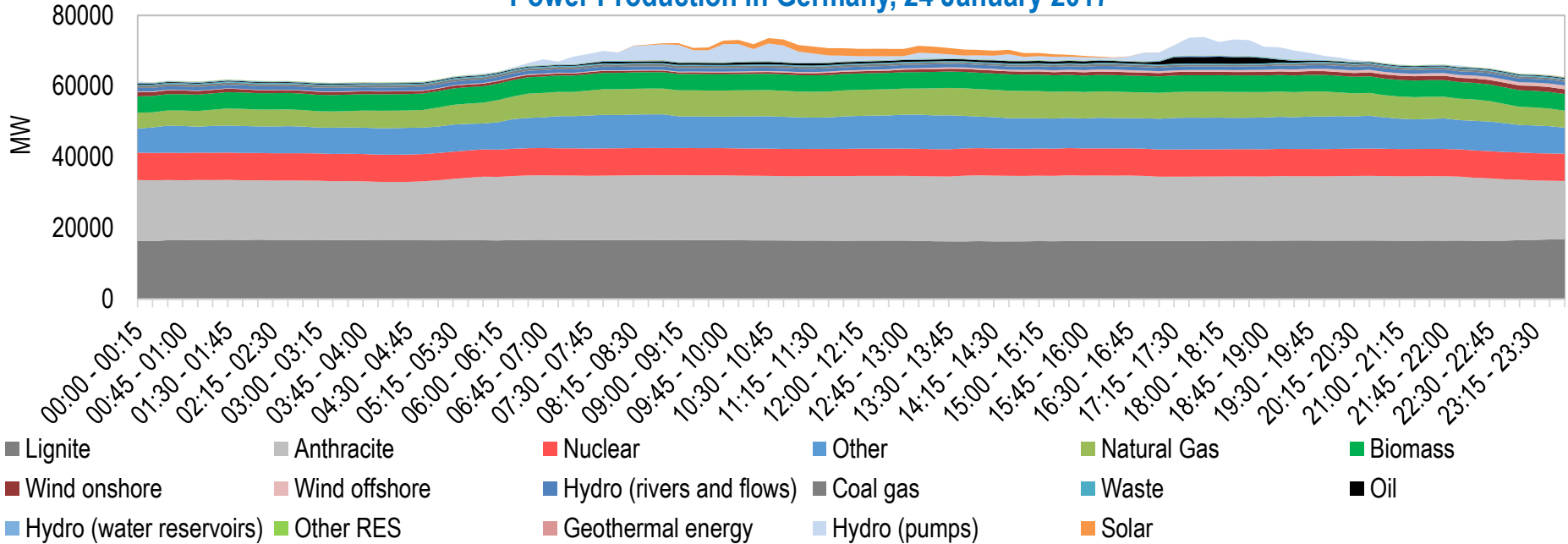
Power Production in Germany, 15 May 2017



Source: ENTSO-E

RES are not capable of providing energy system stability by inappropriate weather conditions and underdeveloped energy storage technologies

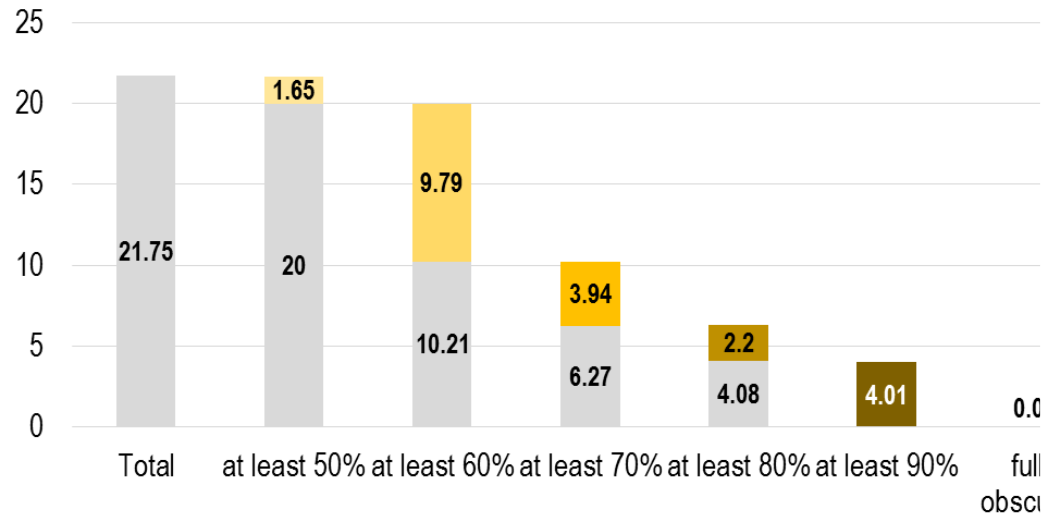
Power Production in Germany, 24 January 2017



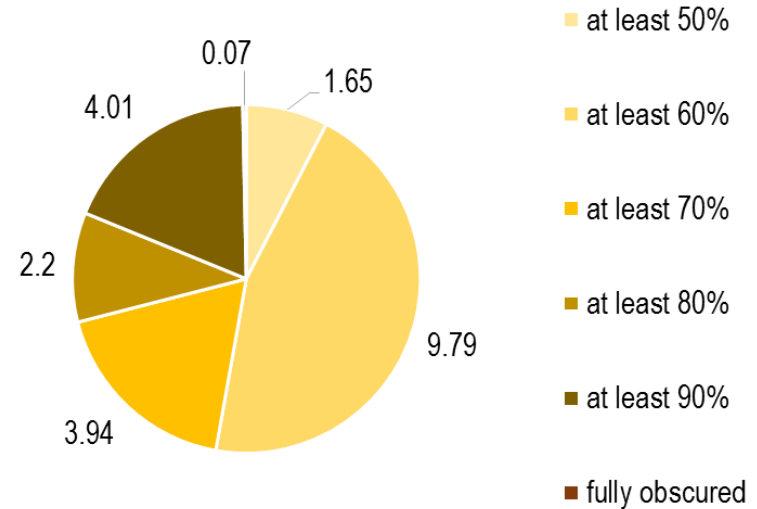
Source: ENTSO-E

RES are not capable of providing energy system stability by inappropriate weather conditions and underdeveloped energy storage technologies

Solar Generation in the USA obscured at least 50% by August 21 Solar Eclipse

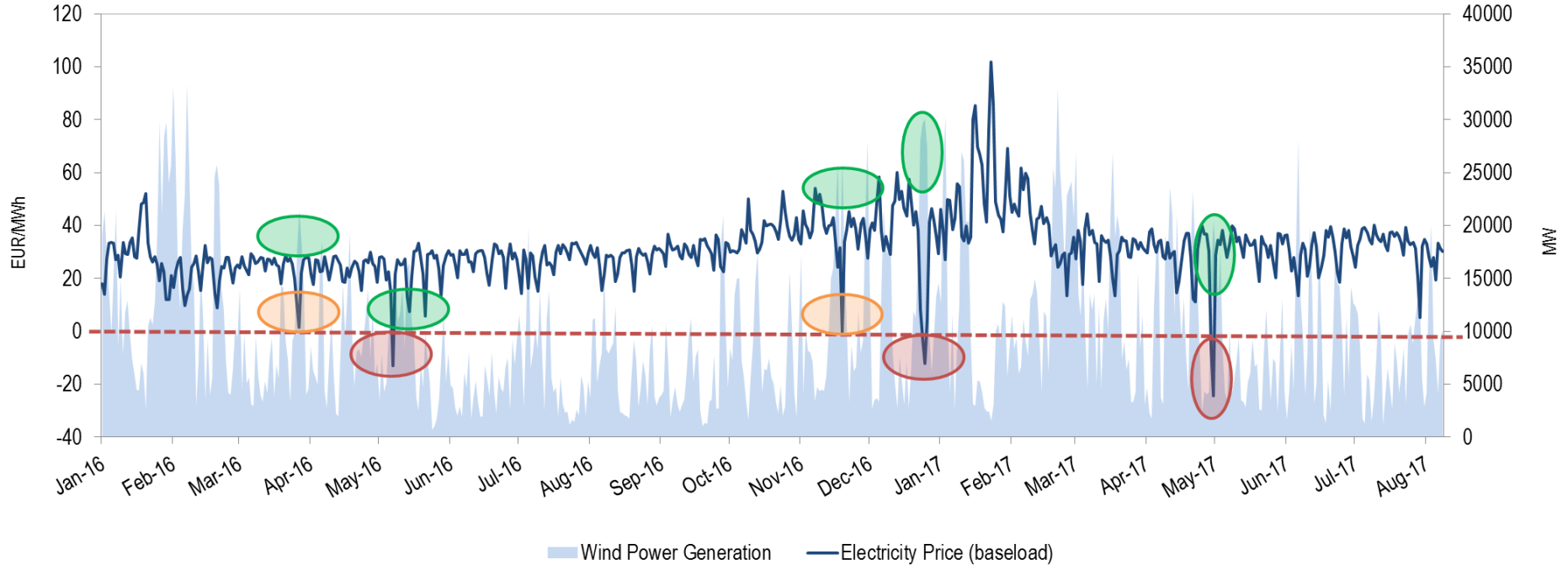


Obscured Solar Generation in the USA, GW



Source: EIA

RES subsidization and priority of dispatching destroy market mechanisms and lead to the negative prices

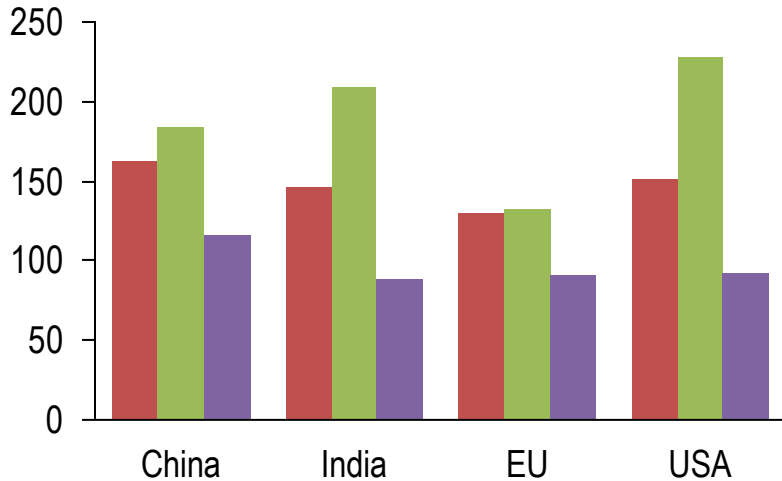


Source: Bloomberg

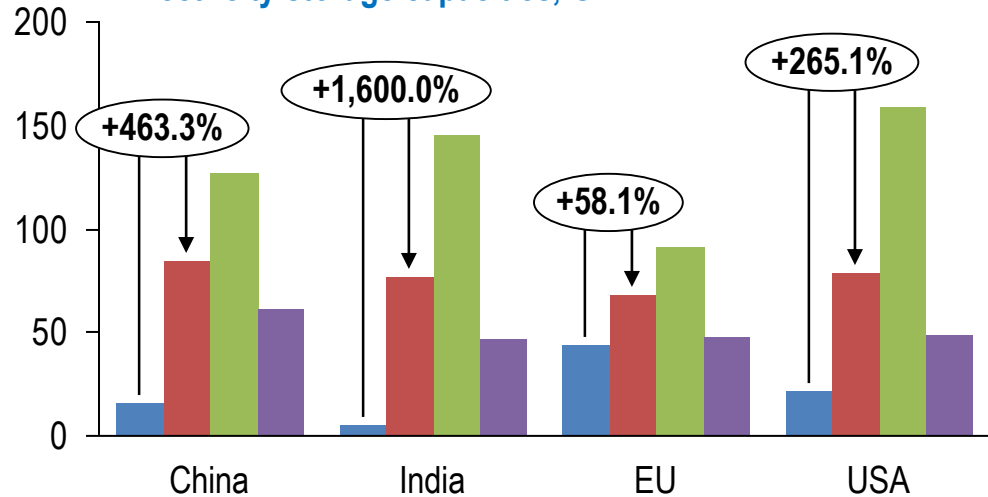
RES Development requires investments in storage capacities

310 GW of additional electricity storage capacities are required to achieve 27%-44% RES share by 2050, what means additional investments.

Required investments (2010-2050), bln USD



Electricity storage capacities, GW



Source: IEA

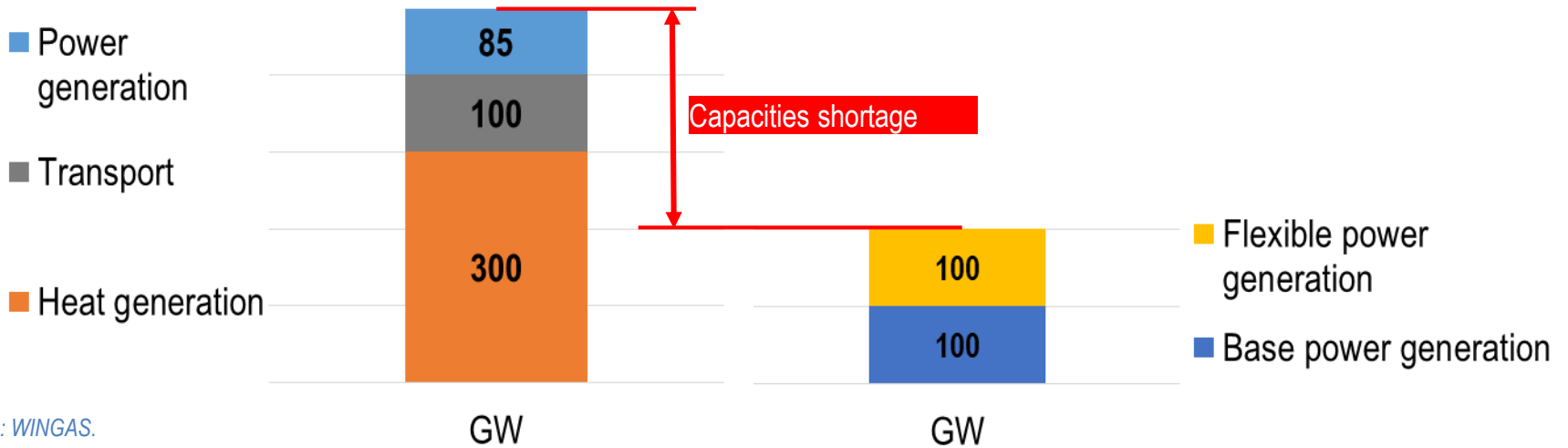
2011 2DS Breakthrough EV

Transition to 100% electric power and heat supply requires explosive capacity increase

Power demand today

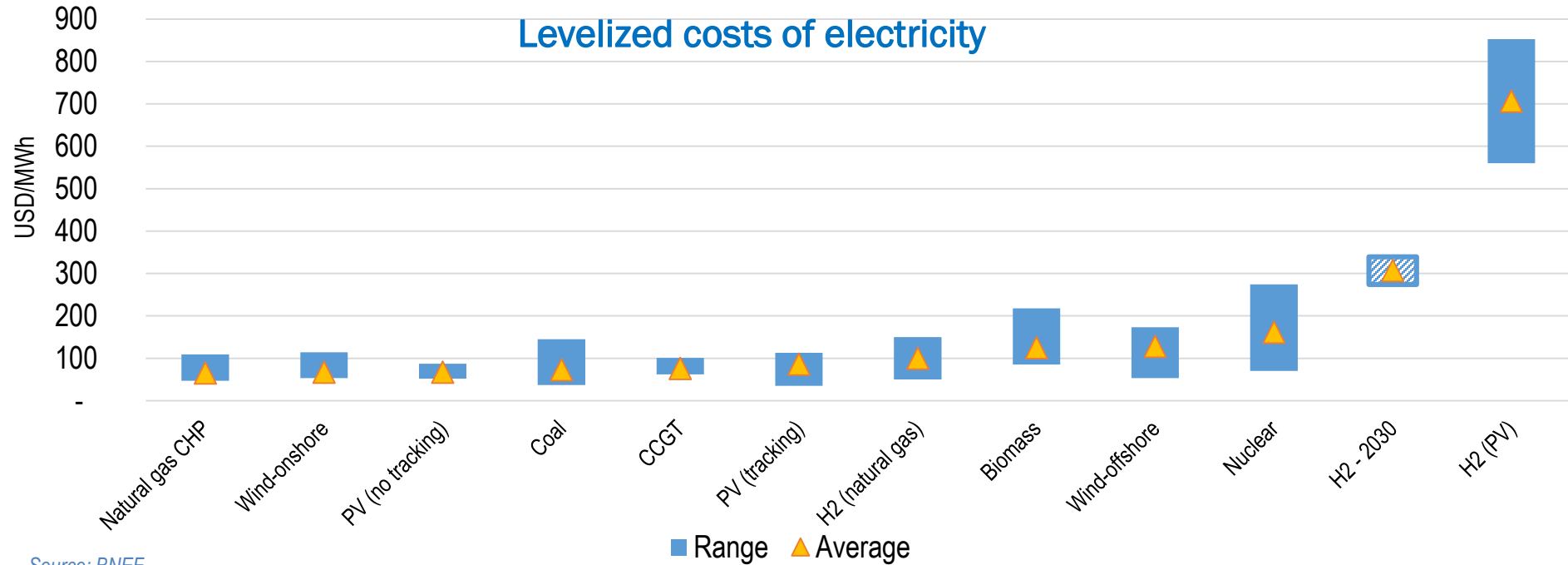
Power generation today

Apart from storage capacity, RES development requires huge land areas. For example, to achieve German climate plan goals each 2.6 km should be occupied with wind generator as high as Cologne Cathedral .



Source: WINGAS.

Natural gas provides the lowest levelized costs of electricity

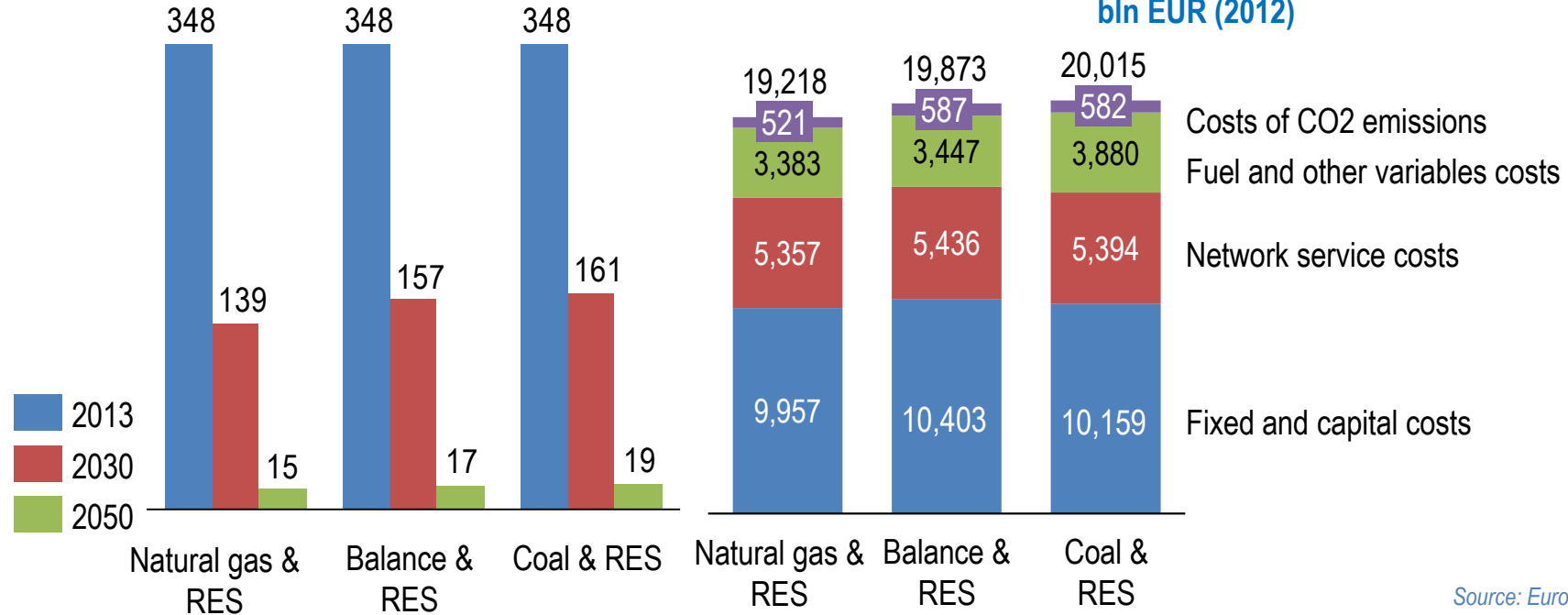


Source: BNEF

Natural gas along with RES may serve as economically justified means of climate goals achievement

Energy cleanliness, g CO₂/kWh

Costs for different climate goals achievement scenarios in 2013-2050, bln EUR (2012)



Source: European Gas Forum

1. By current development level of energy storage technologies RES are not capable of providing energy system security
2. RES subsidization and their priority dispatching set under risk investments in natural gas power generation, despite the fact that natural gas is the cleanest fossil fuel
3. Combination of natural gas and RES is the most pragmatic way of climate goal achievement by the lowest costs

1. Re-estimation of energy security risks, taking into account alternative climate scenarios
2. Refusal from RES subsidization and taking into account all the cost components to restore market mechanism
3. Energy policy, needs to be adjusted to balance RES and natural gas as a source of flexibility

Thank you!



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