CAN THE GAS POTENTIAL BE HARVESTED IN THE ELECTRICITY MARKET?

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CEZ GROUP IS AN INTERNATIONAL UTILITY WITH A STRONG POSITION IN CEE

■ Energy Assets   ○ **Active subsidiary**

■ Trading Activities

CEZ Group in Poland
(100% stake in Skawina, 100% in Elcho)

▪ Electricity generation, gross (TWh)	2.2
▪ **Market share**	**1.4%**
▪ Installed capacity (MW)	730
▪ **Market share**	**2.0%**
▪ Number of employees	421
▪ Sales (EUR million)	115

CEZ Group in the Czech Republic

▪ Electricity generation, gross (TWh)	63.3
▪ **Market share**	**72%**
▪ Number of connection points (million)	3.6
▪ **Market share**	**61%**
▪ Installed capacity (MW)	12,814
▪ Number of employees	20,559
▪ Sales (EUR million)	6,601

CEZ Group in Turkey
(50% stake in SEDAS through AkCez, 37.36% stake in Akenerji)

▪ El. sales to end customers (TWh)	6.1
▪ Number of connection points (million)	1.3
▪ **Market share**	**6.5 %**
▪ Installed capacity (MW)	715
▪ **Market share**	**1.1%**

CEZ Group in Romania
(100% stakes in CEZ Distributie, CEZ Vanzare, Tomis Team, Ovidiu Development, TMK Hydroenergy Power)

▪ El. sales to end customers (TWh)	3.5
▪ Number of connection points (million)	1.4
▪ **Market share**	**16.1%**
▪ Installed capacity	318 MW
▪ Number of employees	1,975
▪ Sales (EUR million)	400

CEZ Group in Bulgaria
(67% stake in CEZ Razpredelenie Bulgaria, CEZ Electro Bulgaria, 100% in TPP Varna)

|	
▪ El. sales to end customers (TWh)	10.0
▪ Number of connection points (million)	2.1
▪ **Market share**	**40%**
▪ Installed capacity (MW)	1,260
▪ **Market share**	**11.9%**
▪ Number of employees	3,910
▪ Sales (EUR million)	840

- **What have power companies seen in 2008?**

- **What has then happened?**

- **What needs to happen so that gas potential in power production can be harvested?**

- **What can the gas TSOs do to help harvest the potential?**

IN 2008 POWER COMPANIES FACED A PROBLEM OF AGING CONVENTIONAL EUROPEAN POWER GENERATION PORTFOLIO

European Portfolio Age Structure
EU 27 countries, Net Capacity

GW
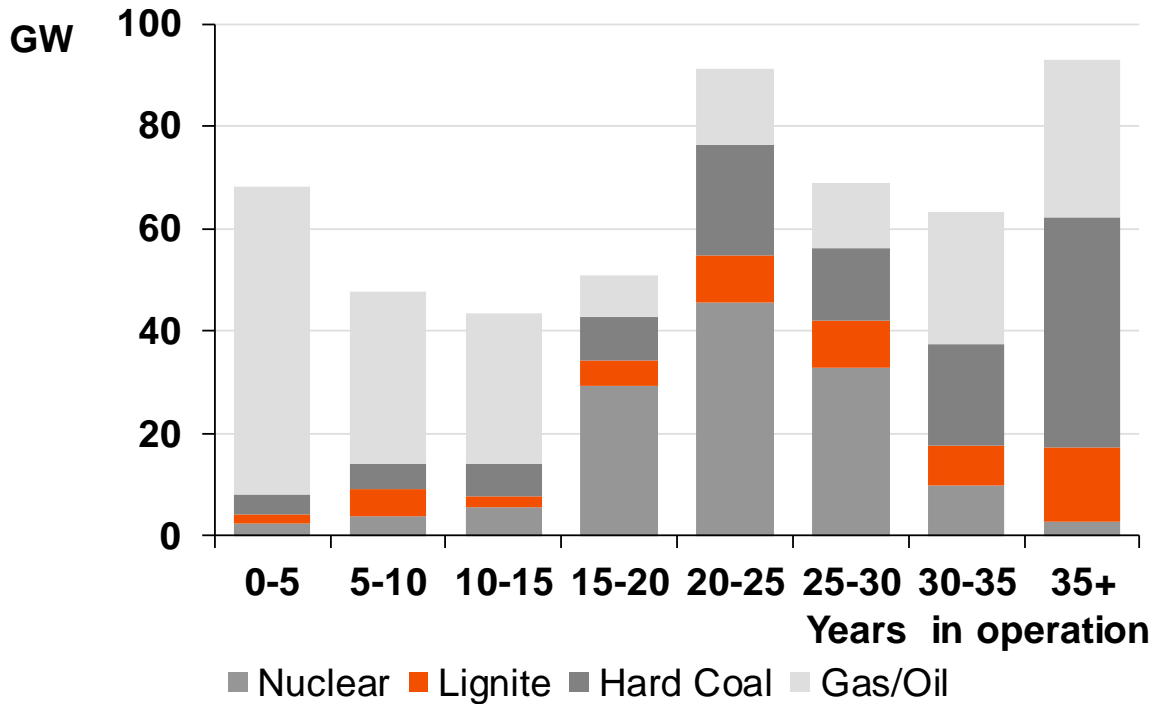
- 65% of conventional plants have exceeded half of their lifecycle

- More than third of thermal plants need to be replaced or repowered within 10 years

Legend: ■ Nuclear ■ Lignite ■ Hard Coal ■ Gas/Oil

Years in operation: 0-5, 5-10, 10-15, 15-20, 20-25, 25-30, 30-35, 35+

EU 2020 TARGETS: 3x20%

- **Cover 20% of final energy consumption by renewable sources**

- Reduce GHG emissions by 20% compared to 1990

- Increase energy efficiency by 20%

- **RES target for power industry itself higher than 20%**

- **RES target introduced significant amount of intermittent power that needs to be compensated**

EU 2020 TARGETS: 3x20%

- Cover 20% of final energy consumption by renewable sources

- **Reduce GHG emissions by 20% compared to 1990**

- Increase energy efficiency by 20%

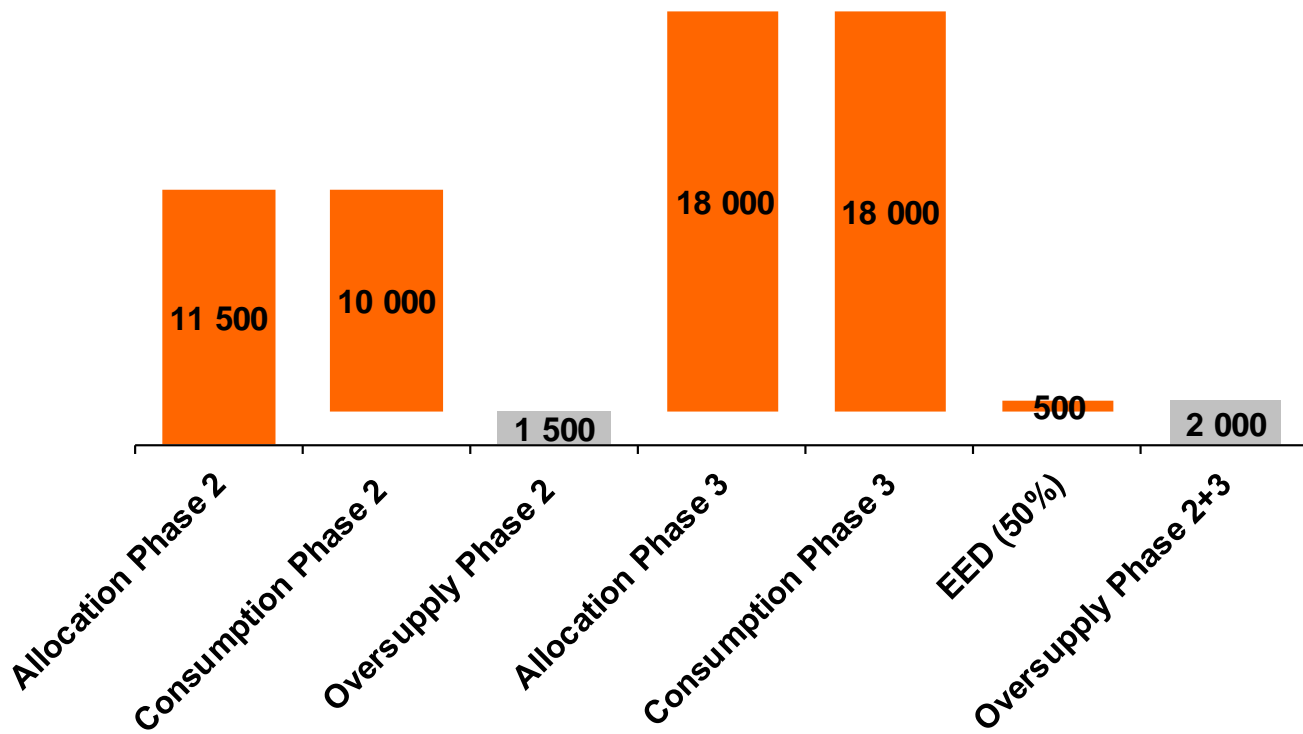**Low CO2 emission sources**

CO_2 emission per 1 TWh netto
th t CO_2
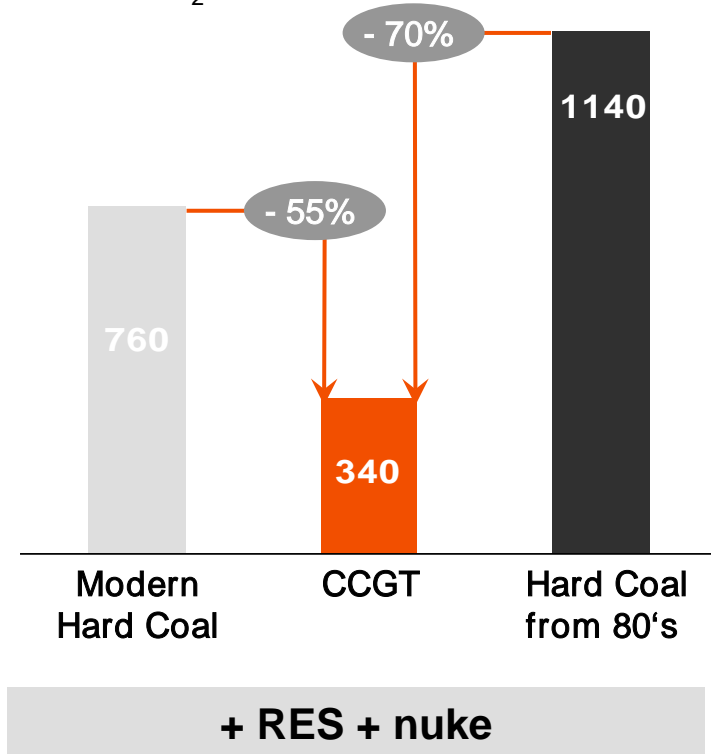
- 70%

- 55%

1140

760

340

Modern Hard Coal

CCGT

Hard Coal from 80's

+ RES + nuke

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CO_2 balance for the second and third phases of the EU ETS M_T*

Allocation Phase 2: 11 500
Consumption Phase 2: 10 000
Oversupply Phase 2: 1 500
Allocation Phase 3: 18 000
Consumption Phase 3: 18 000
EED (50%): 500
Oversupply Phase 2+3: 2 000

EUA Price (EUR/t)
Source: ICE

RES HAVE DEVELOPED FAST …

Generation from RES in Germany (2020: 100% NREAP target fulfilled)
TWh, Source: BMWi, NREAP
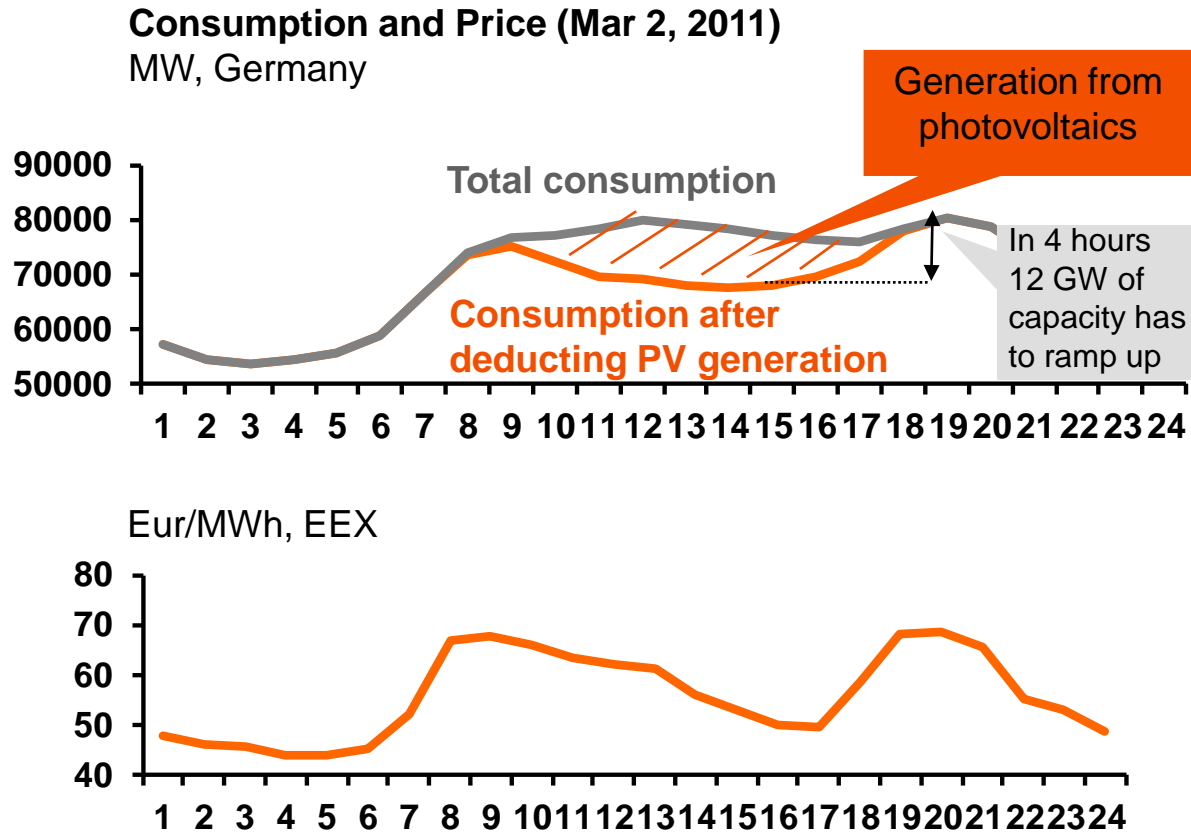

- Solar
- Wind
- Biomass
- Hydro

2005 2006 2007 2008 2009 2010 2011 2012 2020
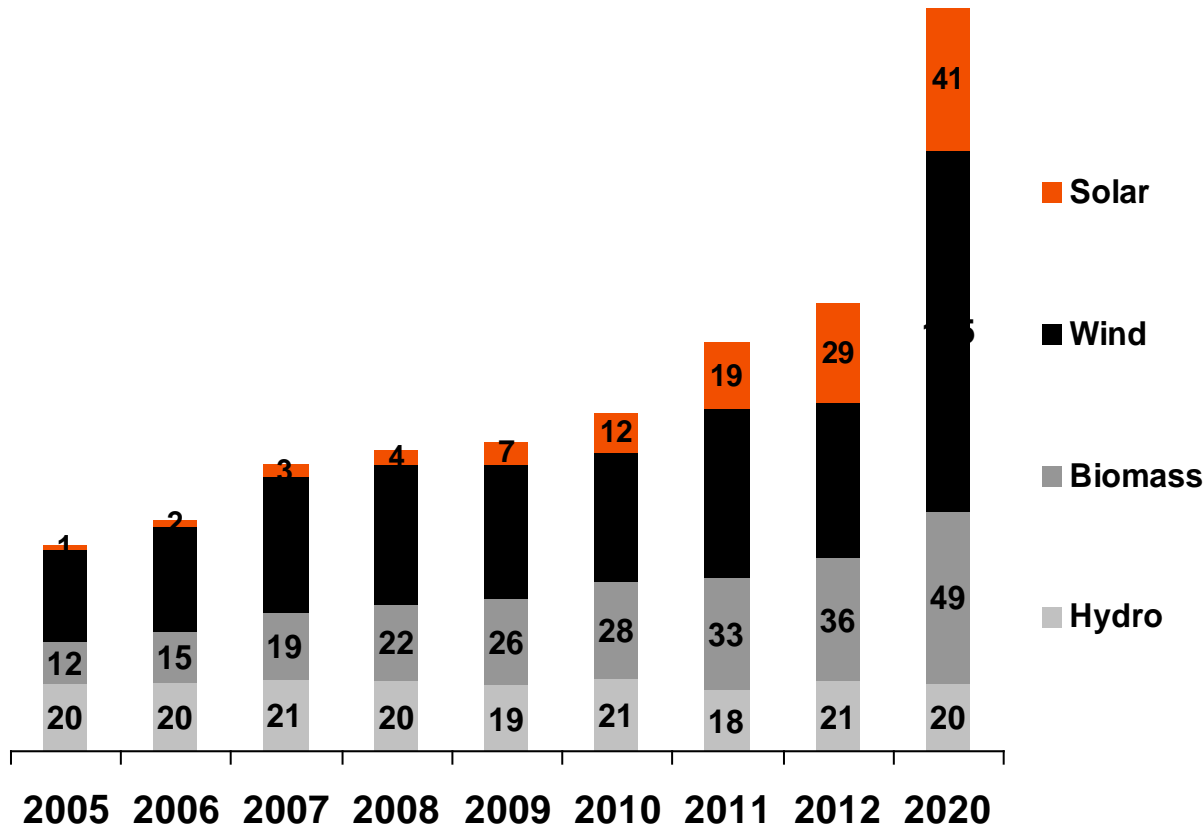
- The generation from RES should according to German plans cover almost 40% of total generation in 2020

- The target achievement is uncertain but Germany remains on track so far

Consumption and Price (Mar 2, 2011)
MW, Germany

Generation from photovoltaics

Total consumption

Consumption after deducting PV generation

In 4 hours 12 GW of capacity has to ramp up

Eur/MWh, EEX

INTERMITTENT POWER HAS BEEN COMPENSATED ALSO BY LIGNITE AND NUCLEAR POWER PLANTS

**German power plant output / Dec 2012
GW**
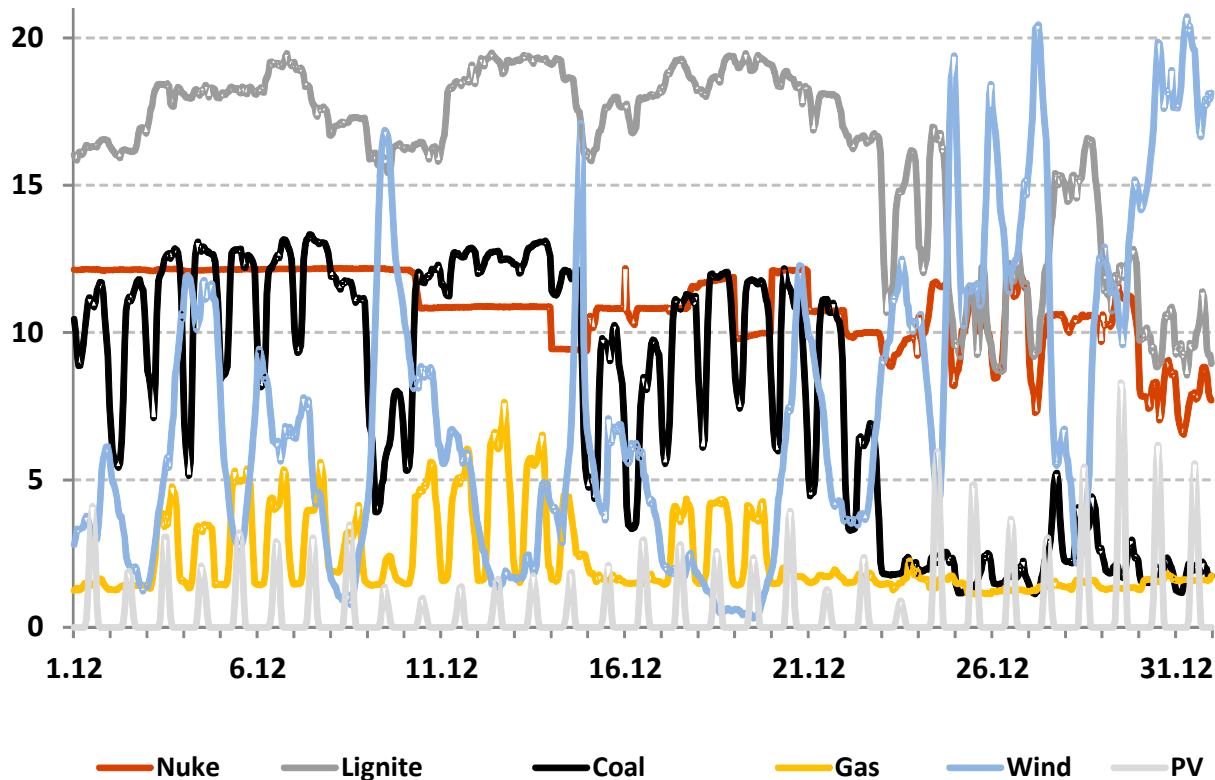
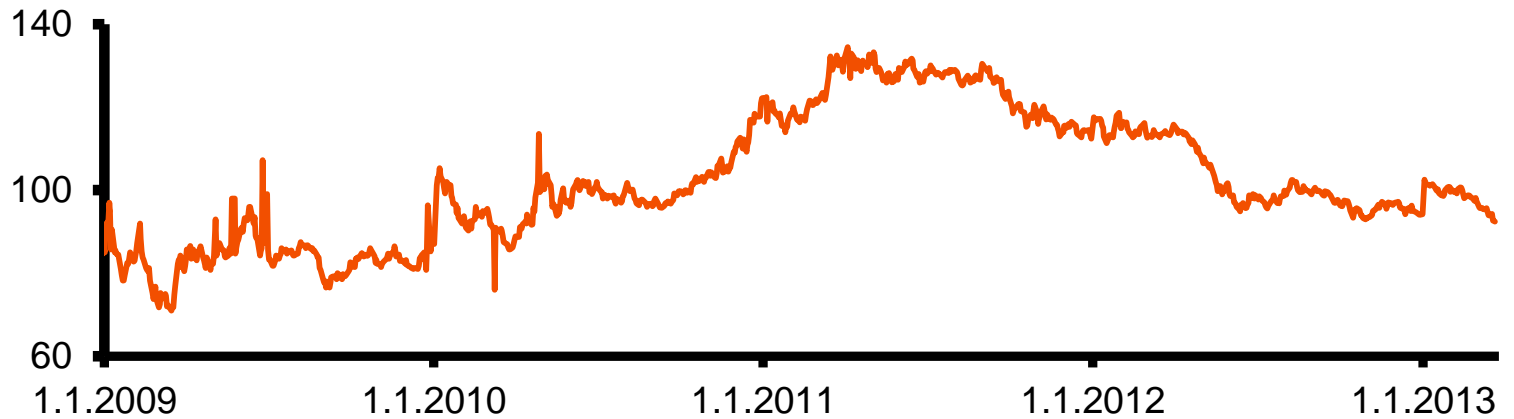- **Under strong wind production coal and gas plants run only at minimum**
- **Lignite output drops by 50%**
- **Nukes start to regulate its output under strong wind production**

Legend: Nuke, Lignite, Coal, Gas, Wind, PV

SHALE GAS IN US HAS STARTED TO PUSH US COAL TO EUROPE AND ITS PRICE DOWN

Coal API2, Y+1 (USD/t) Source: EEX

Natural gas NCG, Y+1 (EUR/MWh) Source: EEX

Clean Spark Spread PEAK, Y+2, Net Efficiency 56% (EUR/MWh)
Source: EEX, ICE

Illustrative German CCGT production hours in 2014 (hours/month)*
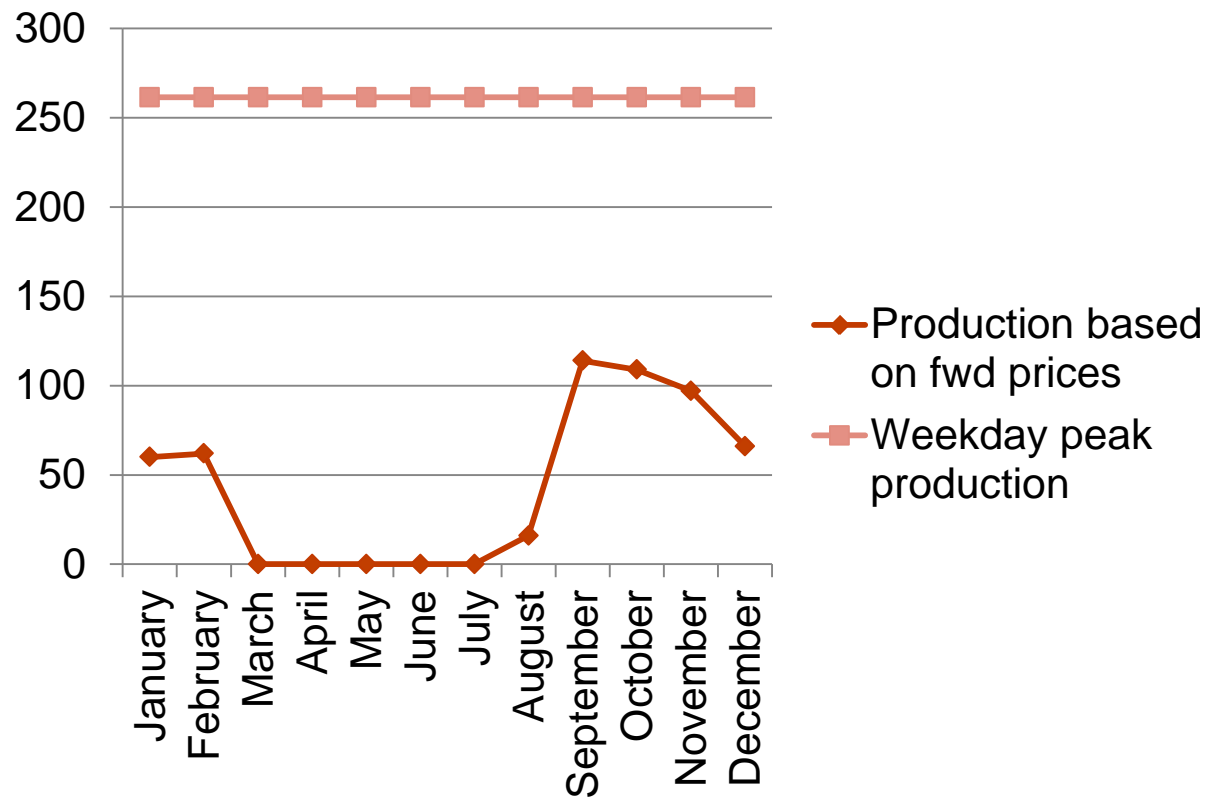
Legend:
- Production based on fwd prices
- Weekday peak production

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Market changes

- Gas price

- Coal price

- EUA price   (EU ETS reform)

- If more RES, than more wind, but not photovoltaics (substantially more expensive than wind)

Regulatory changes

- Capacity remuneration mechanism (but currently would have just minor effect on gas consumption)

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THERE ARE MANY COST-EFFICIENT MEASURES THAT CAN HELP UTILIZE GAS FOR POWER PRODUCTION

- No new pipelines due to power plants, if any then just cost-effective (short) interconnectors to increase flexibility of the gas supply

- Increase flexibility of the network

- Allow efficient access to the short-term capacity of the pipelines, but also of the storages

- Efficient congestion management espec. on short-term basis

- Bundled capacity products

- Daily balancing + as late as possible renomination to react to changing gas offtake due to renewables

- Support interplay of gas and power markets

THANK YOU

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