

Electricity system in Germany understanding the current situation

Dr. Fabian Joas BERLIN, 25 JUNE 2018



Agora Energiewende – Who we are

The team



Agora

Independent think tank with more than 30 energy policy experts

Independent and non-partisan

Project duration 2012-2021

Financed by the Mercator Foundation and the European Climate Foundation

Mission: How do we make the energy transition in Germany and worldwide a success story?

Scientific assessments

Dialogue

Putting forward proposals



More information and studies available at our website www.agora-energiewende.org



To stay below 2 degrees global warming, by 2030 i) coal needs to be at -50% and oil at -25% ii) renewables replacing this are at +300 to 400 GW p.a.





4



The status quo of the Energiewende in Germany



Energiewende in the power sector means: phasing out nuclear and coal, and ramping up efficiency and renewables



The EU's 2030 climate and energy targets imply an annual average share of ~ 52% RES in the power mix The German RES-e target for 2030 is at 65%







Fraunhofer IWES (2015): Assumptions based on national energy strategies and ENTSO-E scenarios in line with EU 2030 targets

RES-E are key for EU's 2030 strategy:

- → EU's 2030 climate target of -40% THG below 1990 <u>puts power sector in centre</u>: Emissions are to be reduced by 65% by 2030 compared to 1990*
- → EU's RES target of probably in the range of 32% by 2030 will largely be delivered by power sector, <u>as biofuels and RES heating sources</u> <u>are limited</u>

Thus, EU 2030 climate and energy targets imply

- \rightarrow ~ 52% Renewables in the power mix
- → Min 30% Wind and Solar in the power mix

(* EU Commission (2011): Impact Assessment on EU 2050 Energy Roadmap, "Diversified supply technologies scenario")



Enough generation capacity in Germany and the EU



- → All reports show that there is no shortage of firm capacity in Europe
- → Especially Germany can shut off nuclear plants and a substantial part of the coal fleet without facing security of supply risks



Effects of high shares of variable renewables in Germany



The power system and power markets will need to cope with a highly fluctuating power production from wind and solar



Berlin, 25 June 2017 | Dr. Fabian Joas



Reliability: blackout times in Germany are very low despite growing shares of renewables





Loop Flows



- → Loop flows exist and are substantial in some situations
- → GER / AUT price zone split, phase shifters and new power lines will reduce the problem substantially



Grid expasion is Germany in progessing, but too slow





Balancing group





Balancing group





Balancing group





Power Market Design

Schematic diagram of the governments' envisaged power market design



Power Market 2.0

Power market is to become highly flexible, so as to continuously let fossil power plants, renewables, demand and storage interact with each other

Resource Adequacy

Peak prices in times of scarcity are to refinance fossil backup power plants; for emergency situations, a capacity reserve is installed

Renewables

Renewables receive 20 year-market premium, support level for large wind and solar power farms is to be determined by auctions as of 2017

EU Emissions Trading

CO₂ price is to be restored through ambitious EU ETS reform including enhanced market stability reserve and higher emission reduction factor Agora Energiewende

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Thank you for your attention!

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Agora Energiewende is a joint initiative of the Mercator Foundation and the European Climate Foundation.

