

# The German ENERGIEWENDE – Status Quo and Goals of the Federal Government

System Integration of Renewable Energies, Grid Development & Flexibilization
Information event for the South Korean decision-makers
Stuttgart, 9 April 2019

Elena Chvanova Consultant Dr. Langniß - Energie & Analyse

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## What is the Energiewende?

 The Energiewende is a technological shift away from fossil and nuclear energy towards renewables and energy efficiency.



 The Energiewende is a fundamental transformation of the energy system and realignment of energy policy.



• The Energiewende is an inter-generational long-term process with a time horizon until 2050 and beyond.



 The Energiewende is a public discourse about the future of energy supply.

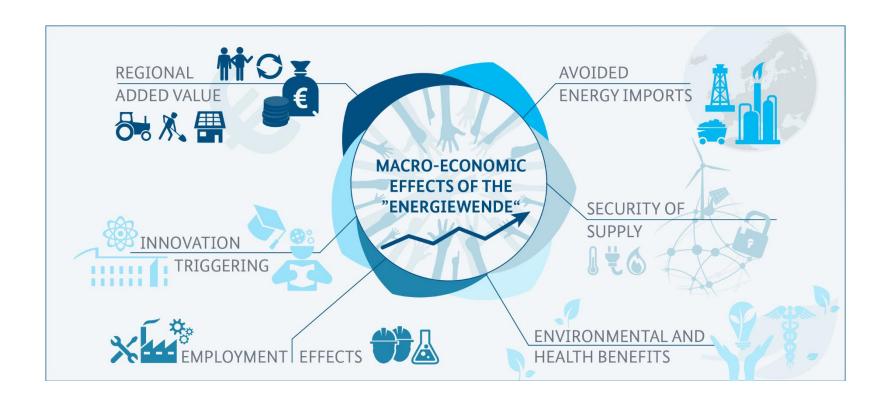


The Energiewende is a long-term strategy based on public acceptance.





### Benefits of the Energiewende

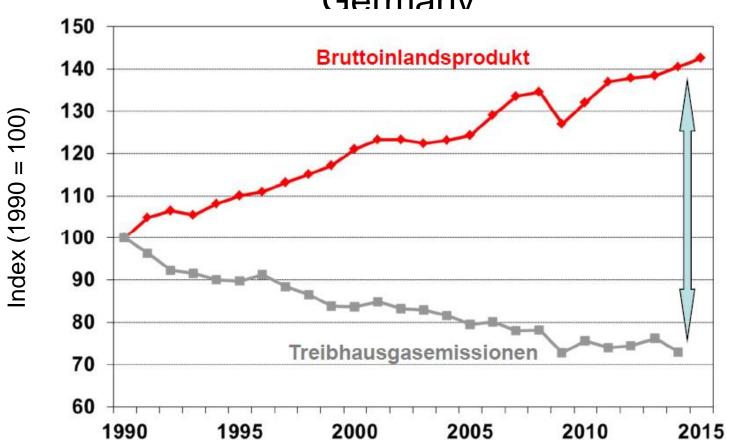


The energy transition has numerous positive effects on various levels.





### Economic development and GHG emissions in Germany



Decoupling of economic growth and GHG emissions succeeded in Germany.





Sources: BMWi 2018, UBA 2017

### Targets of the Energiewende until 2050

		2017	2020	2030	2040	2050
Climate	% greenhouse gas reduction (vs. 1990)	-27.7 %	-40 %	-55%	-70%	-80-95%
Renewable energy	% gross final energy consumption	14.8 %*	18%	30%	45%	60%
	% gross electricity consumption	38.2 %**	Min 35%	Min 50%¹ (65%)²	Min. 65%	Min 80%
	Share in heat consumption	12.9 %	14%			
	Share in Transport sector	5.2 %	10% (EU)			
Energy efficiency	% primary energy consumption (vs. 2008)	-6.5 %*	-20%			-50%
	Final energy productivity (2008-2016)	1.1% p.a.*	2.1% per year (2008-2050)			
	Gross electricity consumption (vs. 2008)	-3.6 %*	-10%			-25%
	Primary energy demand (buildings) (2008)	-18.3 %*				- 80 %
	Heat demand (buildings) (vs. 2008)	-6.3%*	-20%			
Transport	Final energy consumption in transport (vs. 2005)	+4.2%*	-10%			-40%
	Number of Electric vehicles (1/2018) (hybrid cars)	53.861 (236.710)	(1 million)	(6 million)		

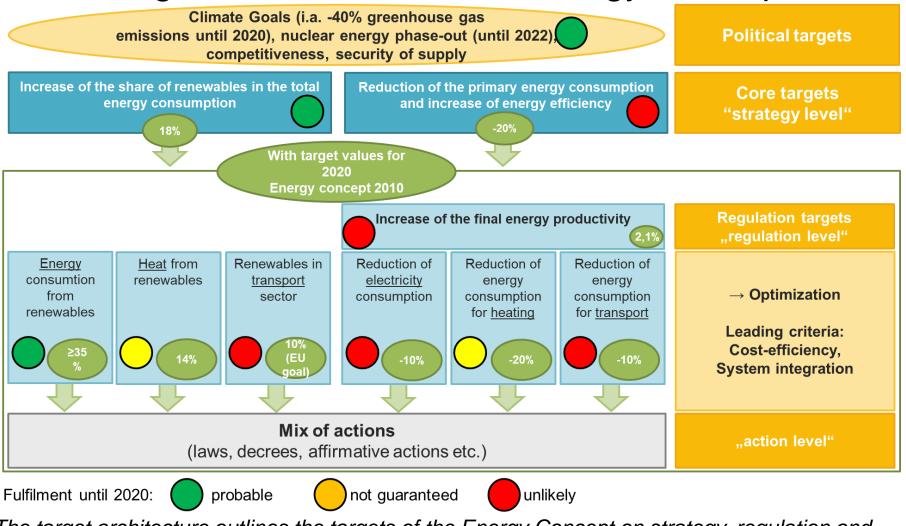
The energy transition follows a transparent, long-term strategy with specific targets.

<sup>\*\* = 2018 &</sup>lt;sup>2</sup> Coalition agreement 2018.





### Target architecture of the Energy Concept



The target architecture outlines the targets of the Energy Concept on strategy, regulation and action level.

Sources: BMWi 2018





## The Energiewende started decades ago: Milestones



Continuously developed policy support has fostered steady growth of renewables in Germany.





## Renewable energy auctions

Shift from the price control (Preissteuerung) to the quantity control (Mengensteuerung)

Auctions for new large RE plants from 2017:

- Wind turbines >750 kW
- PV plants >750 kW
- Biomass plants >150 kW

20 years support

EEG 2017 laid down basic principles of quantity control of renewable energy development.





### Path of RE development

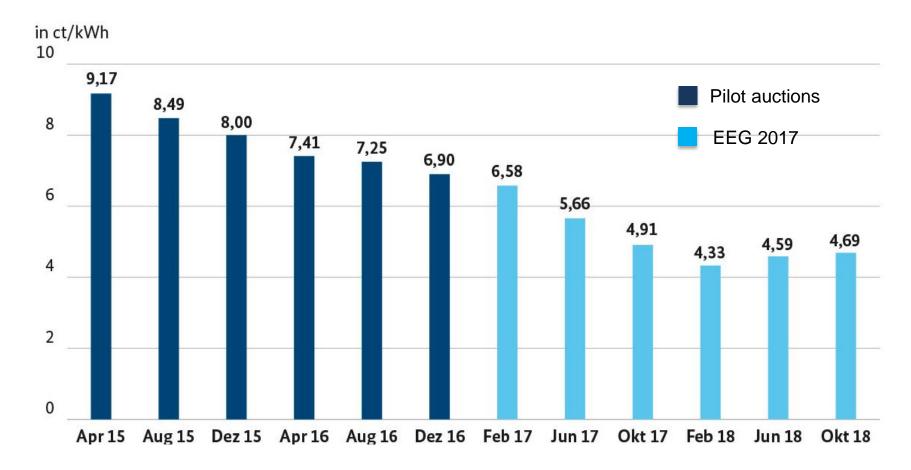
2017-2019 2 800 MW/a **Onshore Wind** From 2020 2 900 MW/a 6 500 MW Till 2020 Offshore Wind Till 2030 15 000 MW **Gross capacity** 2 500 MW/a Solar increase 150 MW/a 2017-2019 **Biomass** 2020-2022 200 MW/a

RE capacity increase should be coordinated with the grid expansion.





## Average surcharge values of auctions for groundmounted PV plants



Auctions for PV ground-mounted plants cause level of support to decline.

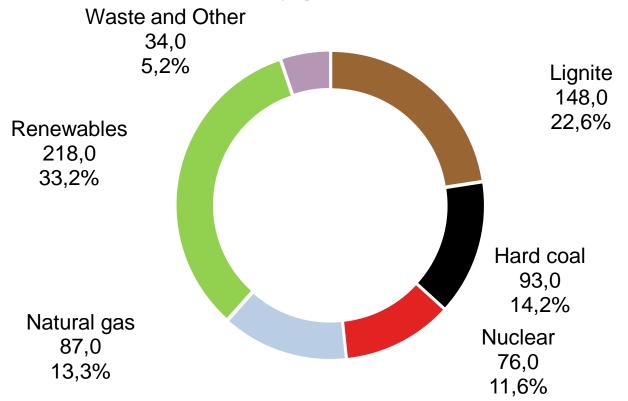




2018

## Gross electricity production in Germany 2017

### **Gross electricity generation in 2017 (654,8 TWh)**

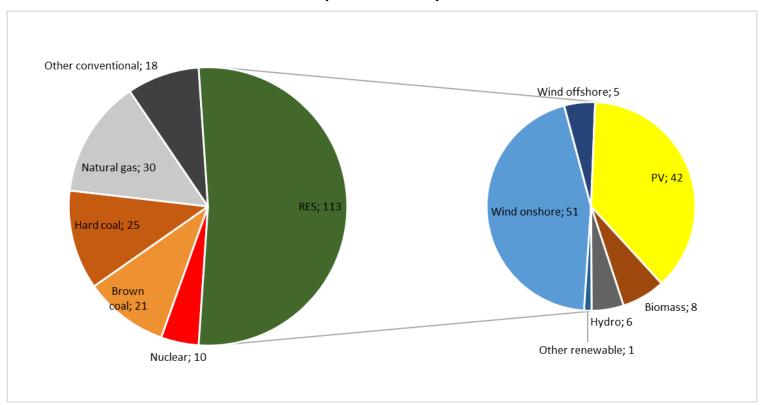


Renewables have become the biggest source of power generation.





# Installed electricity generation capacity in 2018 (in GW)

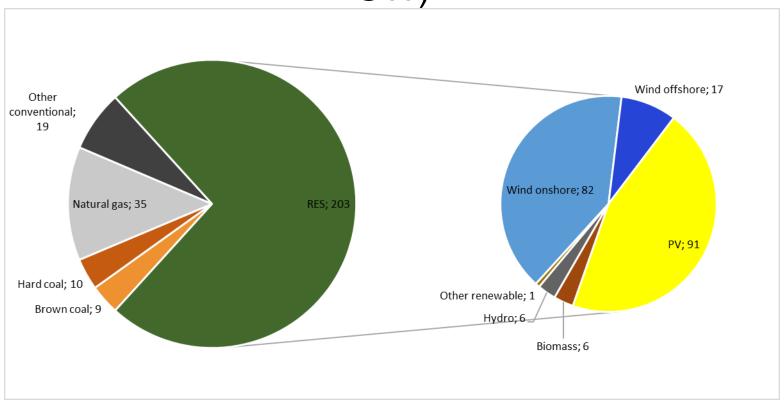


Over half (113 GW) of total installed capacity (216 GW) in Germany is based on renewables - mainly wind onshore and PV.



# Predicted electricity generation capacity in 2030 (in GW)





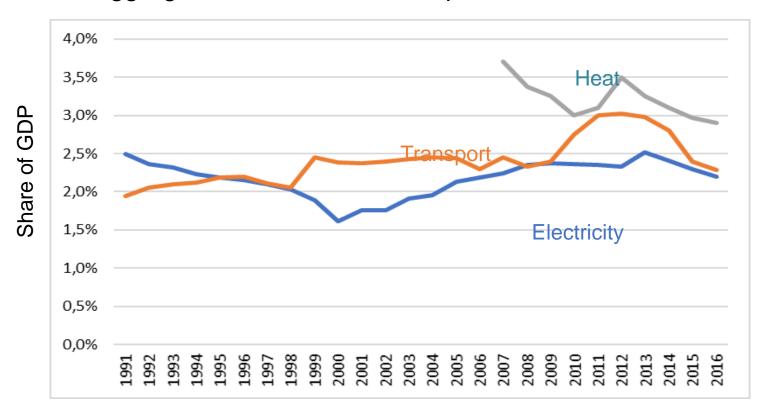
Over 70% (203 GW) of total installed capacity (276 GW) in Germany will be based on renewables - mainly wind onshore and PV.





### Economic feasibility of the Energiewende

Indicator: aggregated final consumer expenses referred to GDP

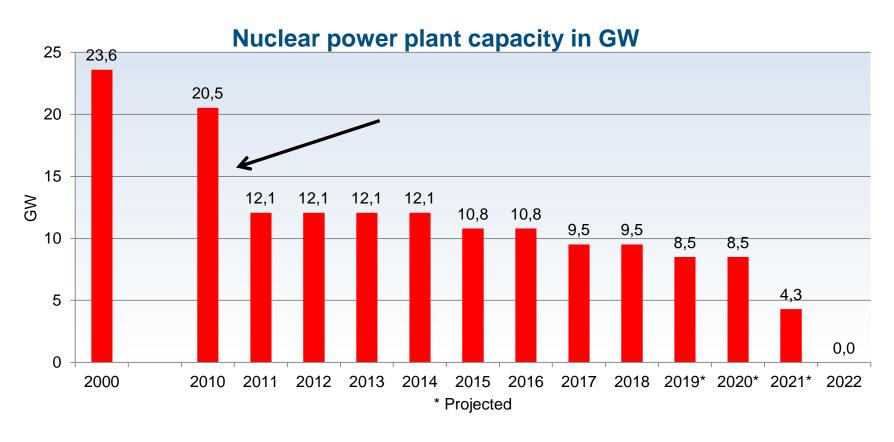


German energy transition well affordable but distributional effects need to be addressed.





### Benefits – Enable nuclear phase-out

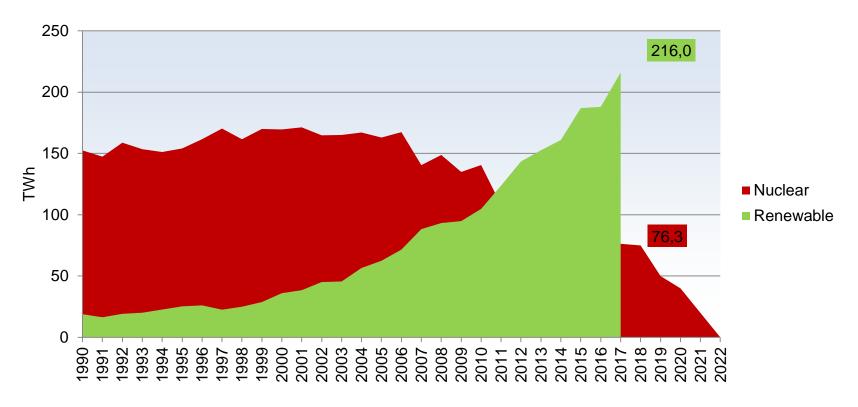


The nuclear phase-out will be gradually implemented by 2022. In 2018 only seven reactors are still operational.





### Renewable vs. nuclear power generation (in TWh)



Nuclear power generation will decline to zero until 2022. Renewable electricity is constantly rising.

On the coal phase-out till 2038: if the objective of 65% of RE in electricity consumption by 2030 will be reached, RE production compensates fall out of coal electricity generation. The coal electricity generation of the coal electricity generation.





### Next steps and priorities of the Energiewende

- Coal phase-out scheduling
- Digitalization of grid and market infrastructure
- Sector coupling (power, heat, transport)
- Electric mobility and charging infrastructure
- Grid integration of growing shares of renewables
- Cross-border interconnections



The Energiewende is a long term process with some challenges ahead.

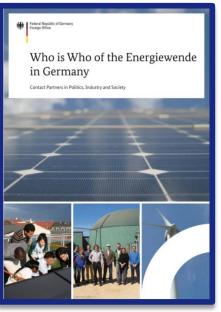
Source: RENAC





# Information brochure: "Who is Who" of the Energiewende

#### **Brochure**



https://www.auswaertiges-amt.de

### **Download**



#### Website



https://www.renac.de/who-is-who

The Foreign Office has published an information brochure, including profiles and contacts of major actors of the Energiewende in Germany. Now also Online.



Thank you for your attention!

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