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# The Energy Transition in the Power Sector: State of Affairs in 2019

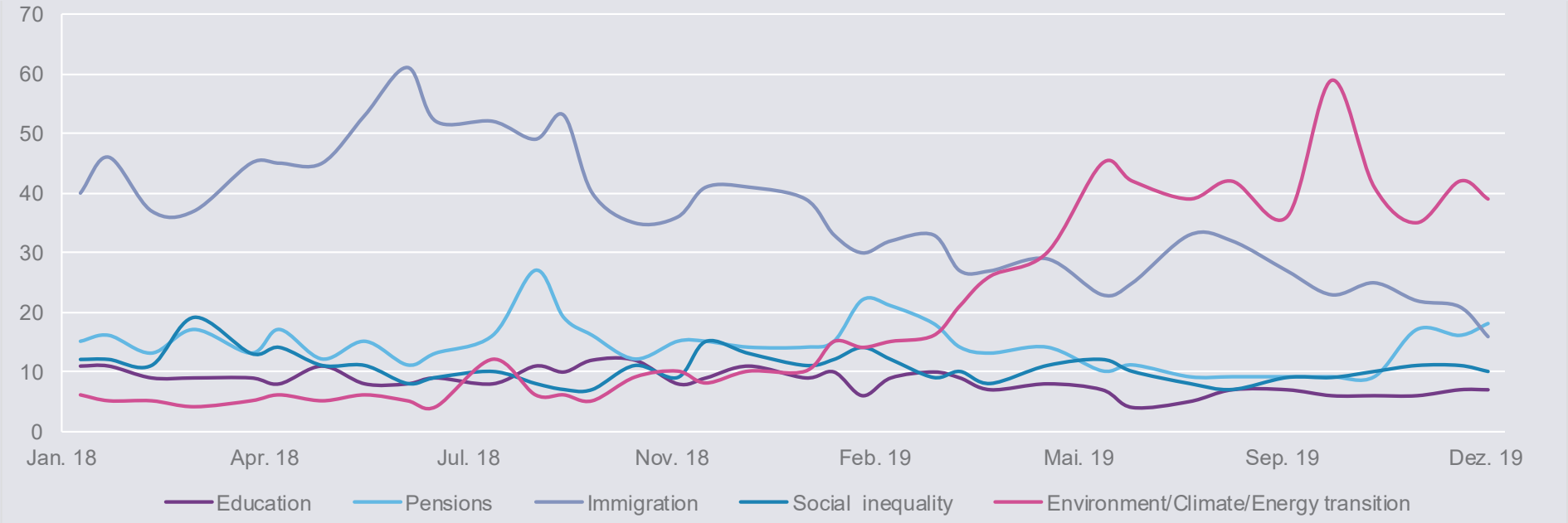
*A review of major developments of 2019, and an outlook for 2020*

**Fabian Hein, Frank Peter**

**BERLIN, 28. JANUARY 2020**

# Concerns over Climate Protection and the Energy Transition became the “most important topic” in 2019 for the first time.

The Top 5 political problems in Germany in 2018-2019

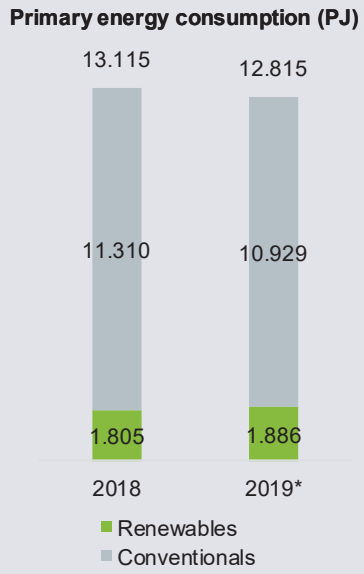


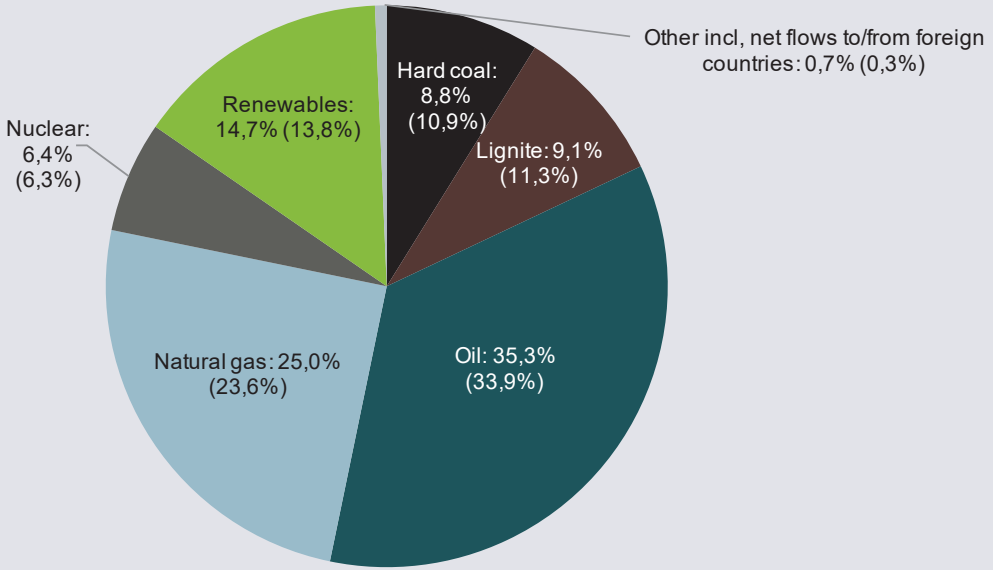

Forschungsgruppe Wahlen (2019): Politbarometer (survey period 1/2018 – 12/2019, selected were the five most-mentioned answers out of twelve possible answers).

# Energy Consumption in 2019

# Primary energy consumption in 2019: Oil remains by far the most important energy carrier. The significance of coal decreases, gas and renewables become more prominent

Primary energy consumption in 2019 (values for 2018 in brackets)

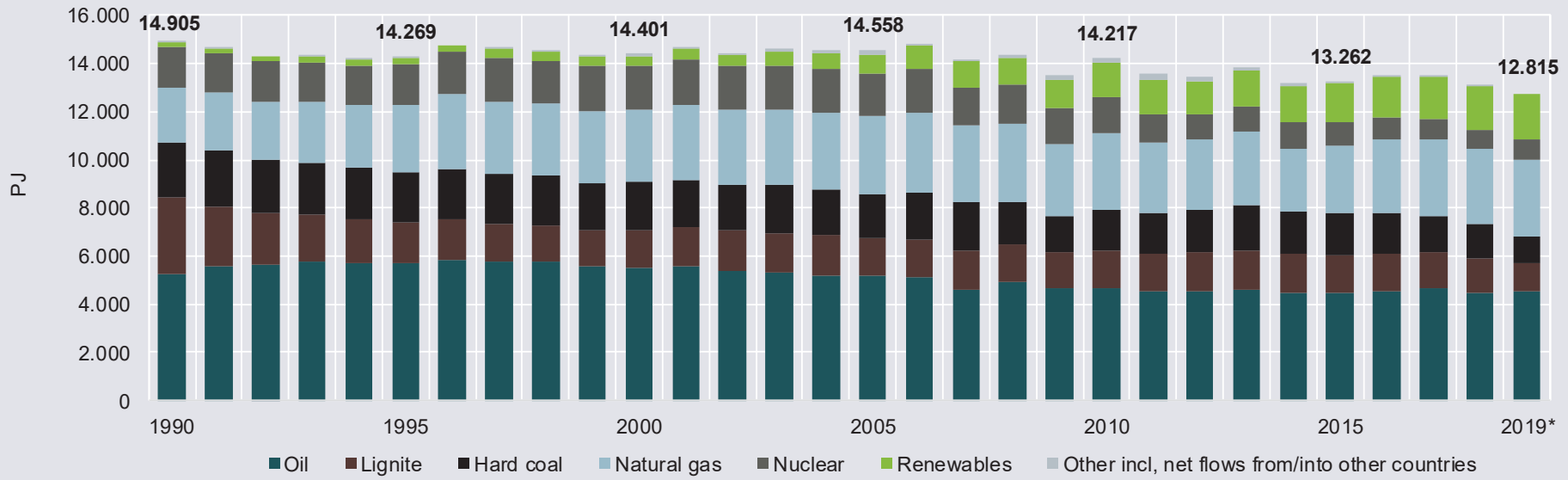



AG Energiebilanzen (2019), *preliminary results

# Primary energy consumption in Germany: Decreasing energy consumption (-2.3% 2019 vs. 2018) due to weaker industry growth and mild weather

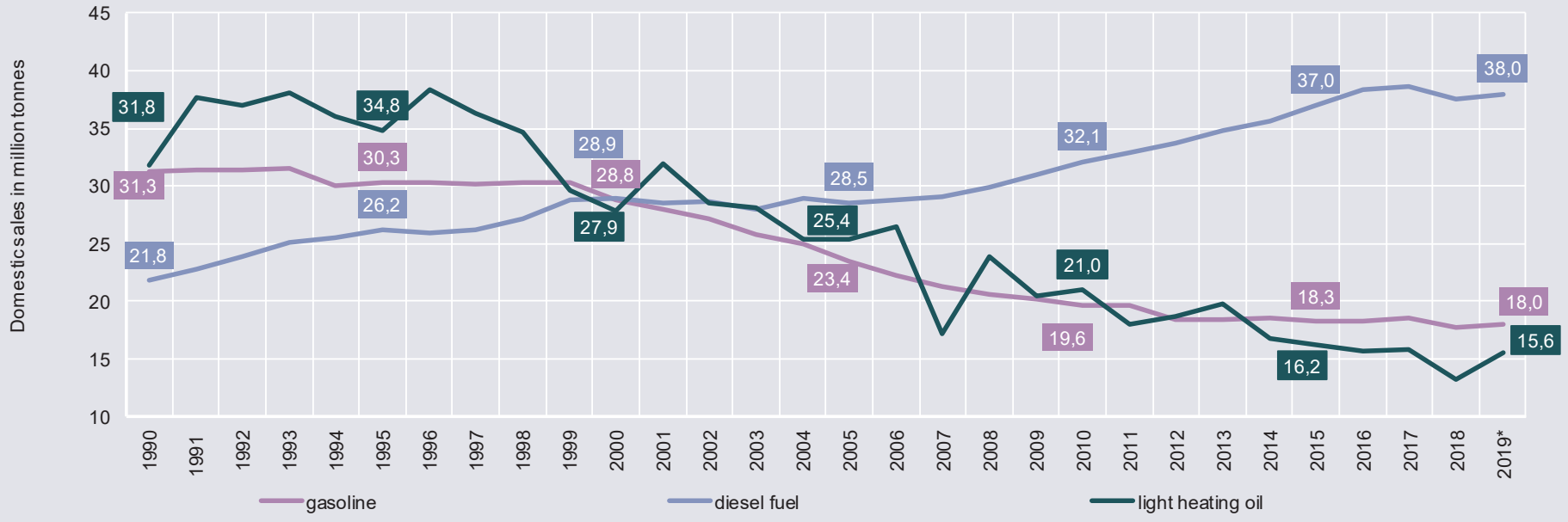
Primary energy consumption from 1990 to 2019




AG Energiebilanzen (2019), *preliminary results

# The consumption of diesel and gasoline increases in 2019 – as well as the number of fuel-intensive SUVs.
# The increase in heating oil is partly due to inventory effects

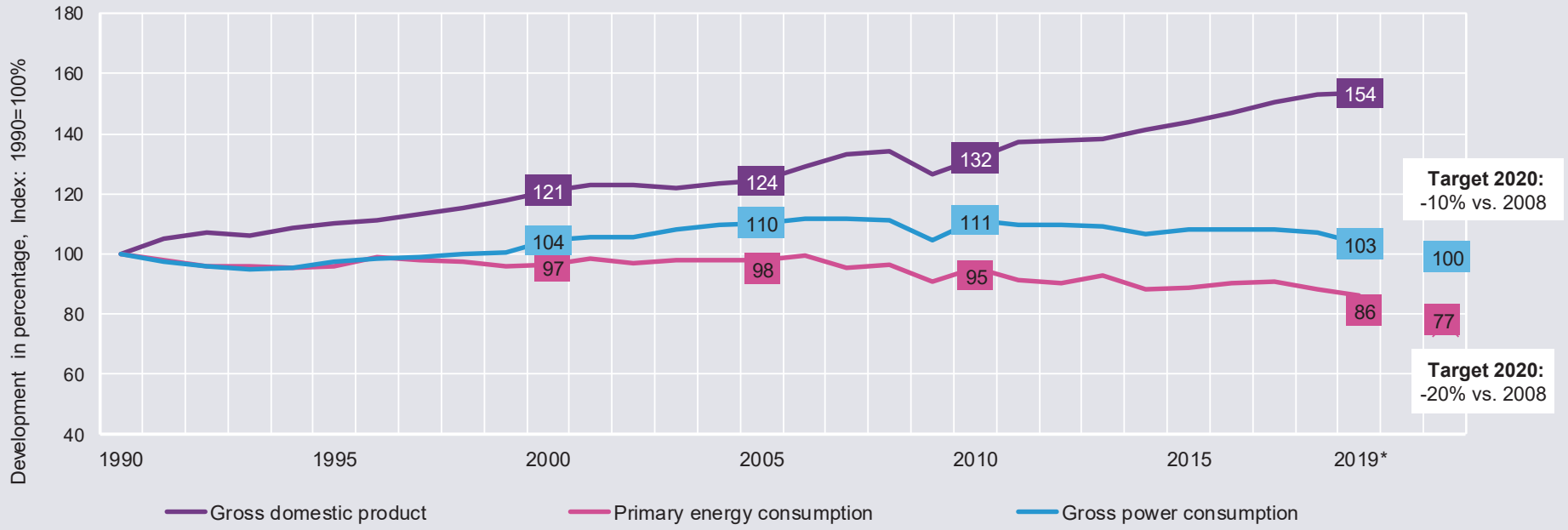
Sales of mineral oil products in Germany from 1990 to 2019




AG Energiebilanzen (2019), Ministry of economic affairs (2019), *preliminary results

# Energy efficiency in 2019: The decoupling of economic growth and energy consumption as well as electricity consumption continues slowly

GDP, primary energy consumption, primary energy consumption and gross electricity consumption 1990-2019 (index: 1990=100)

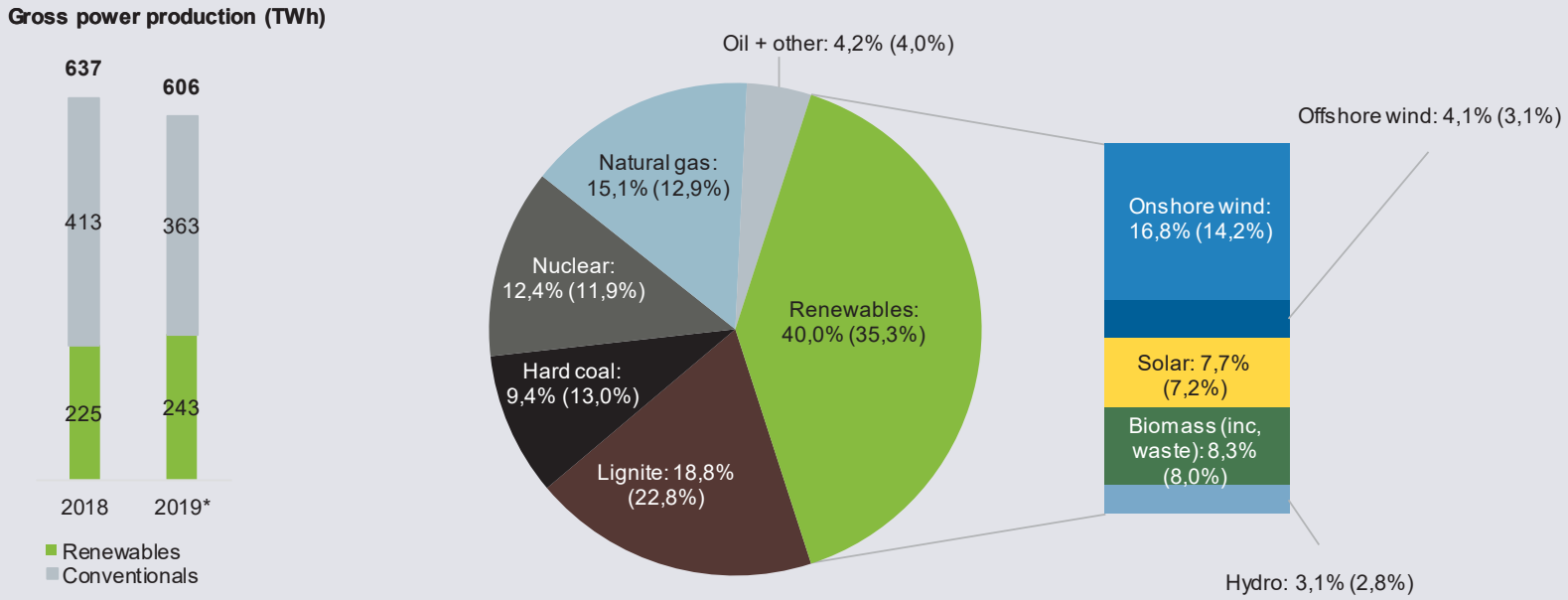



AG Energiebilanzen (2019),Ministry of economic affairs (2019), *preliminary results/own calculations

# Power Generation in 2019

# Electricity mix in 2019: Renewables provide as much electricity as coal and nuclear combined – each around 40% of the total generation

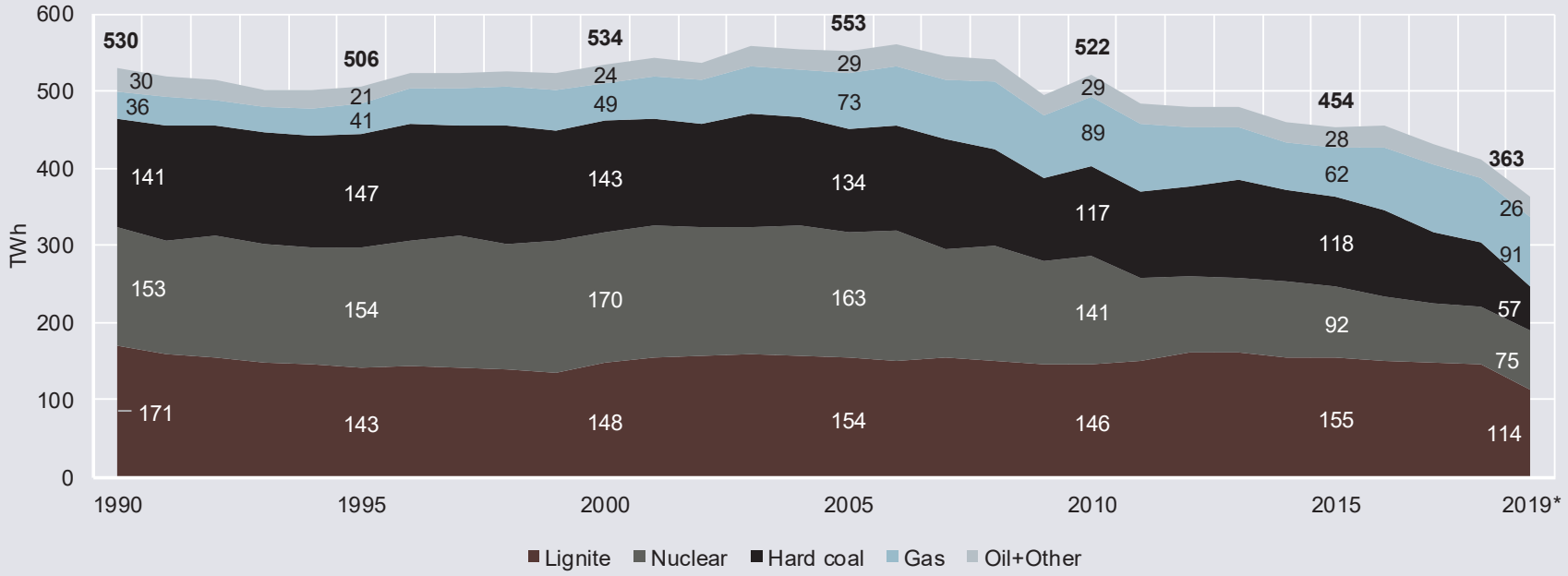
Electricity mix in 2019 (values for 2018 in brackets)




AG Energiebilanzen (2019), *preliminary results

# Conventional power generation in 2019: Drastic decline of hard coal (-31%), and for the first time ever we also see a substantial fall in lignite (-22%) and a record high for gas

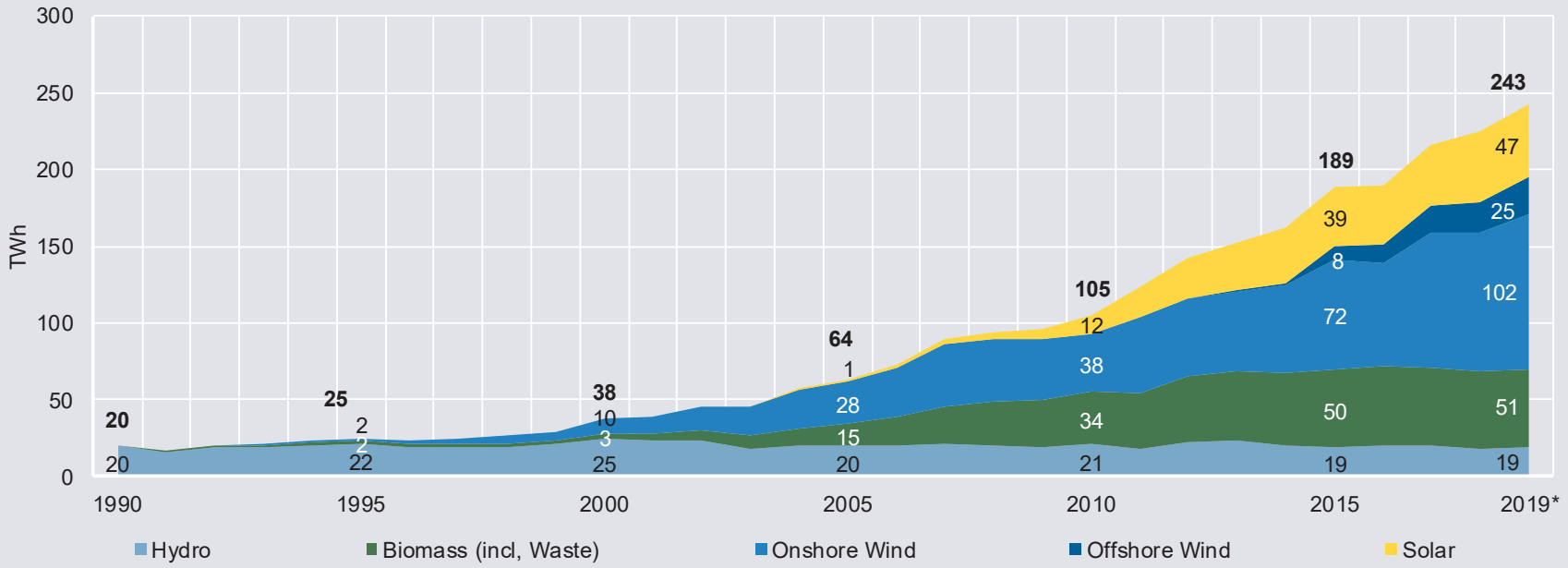
Gross power production from conventional energy sources,1990–2019




AG Energiebilanzen (2019), *preliminary results

# Renewable energy in 2019: Good wind conditions lead to a record in electricity generation from renewables

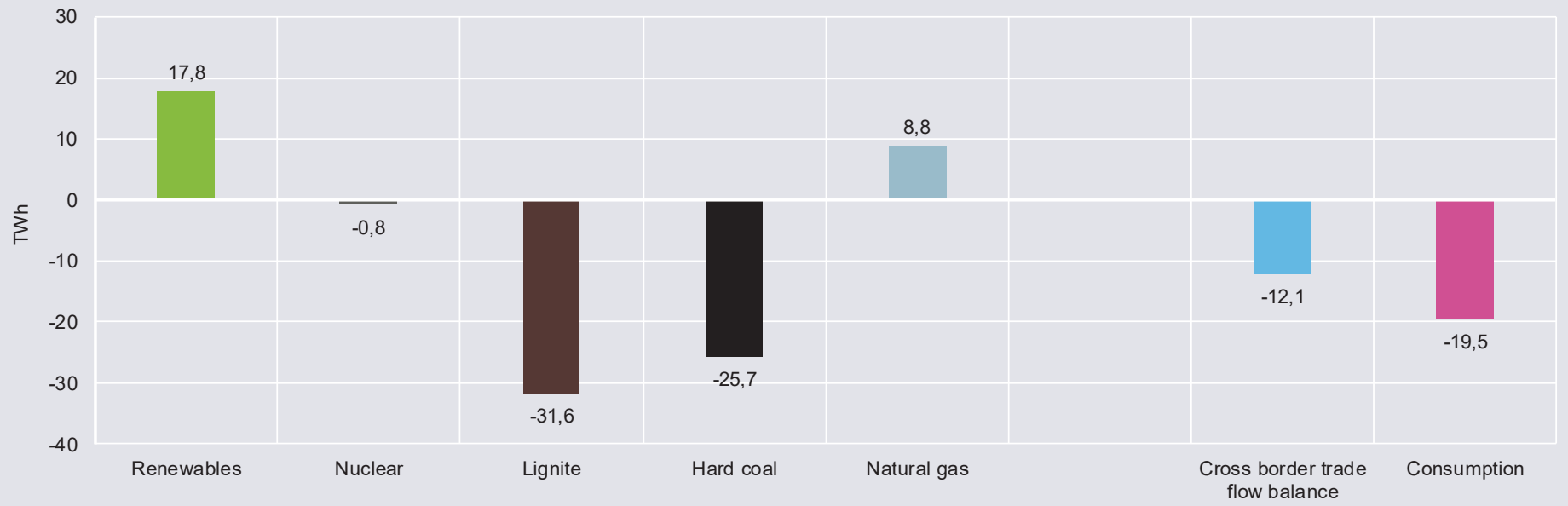
Electricity generation from renewable energies,1990–2019




AG Energiebilanzen (2019), *preliminary results

# Overview of the development 2019 vs. 2018: coal generation collapses – due to a rise in renewables and gas as well as a reduction in consumption and exports

Changes in the electricity sector 2019 vs. 2018




AG Energiebilanzen (2019), preliminary results

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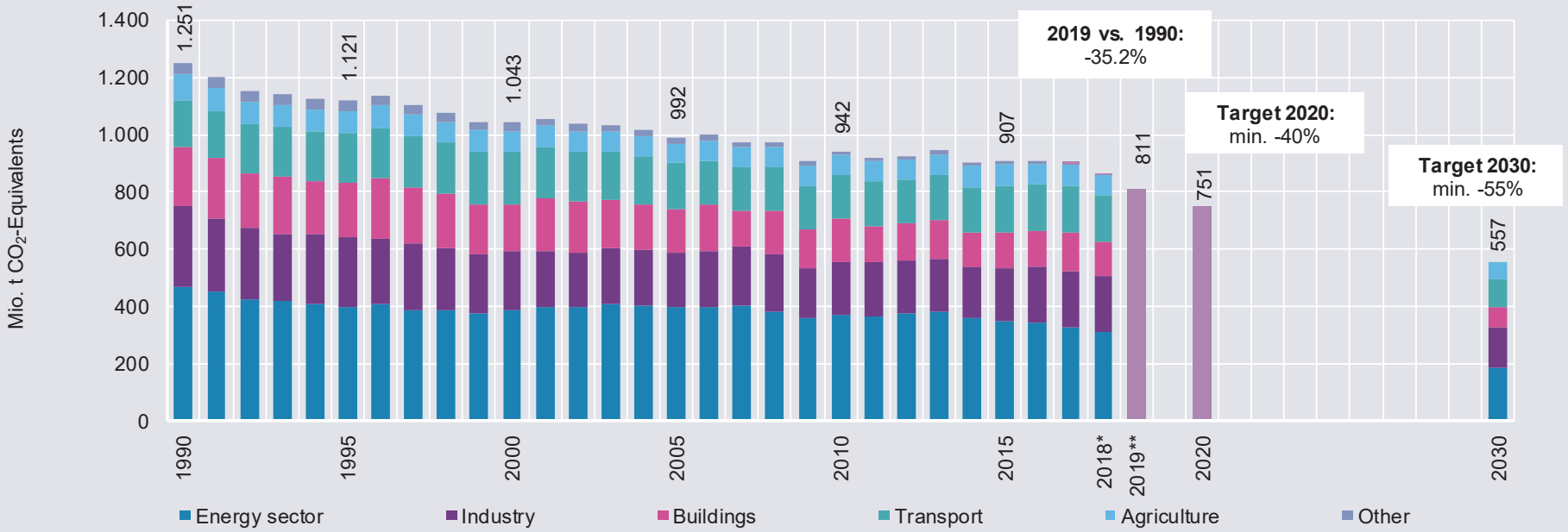
# Greenhouse Gas Emissions in 2019

# Climate protection 2019: Greenhouse gas emissions have fallen over 50 million tonnes this year, a decline of 35 percent compared to 1990

Greenhouse gas emissions by sector 1990 – 2019 as well as 2020 and 2030 climate targets




Umweltbundesamt (2019), own calculations, *preliminary results, **own estimates

# So will we reach our climate target (-40% GHG emissions in 2020 compared to 1990)?

## Will we reach our climate target (-40% GHG emissions by 2020)?

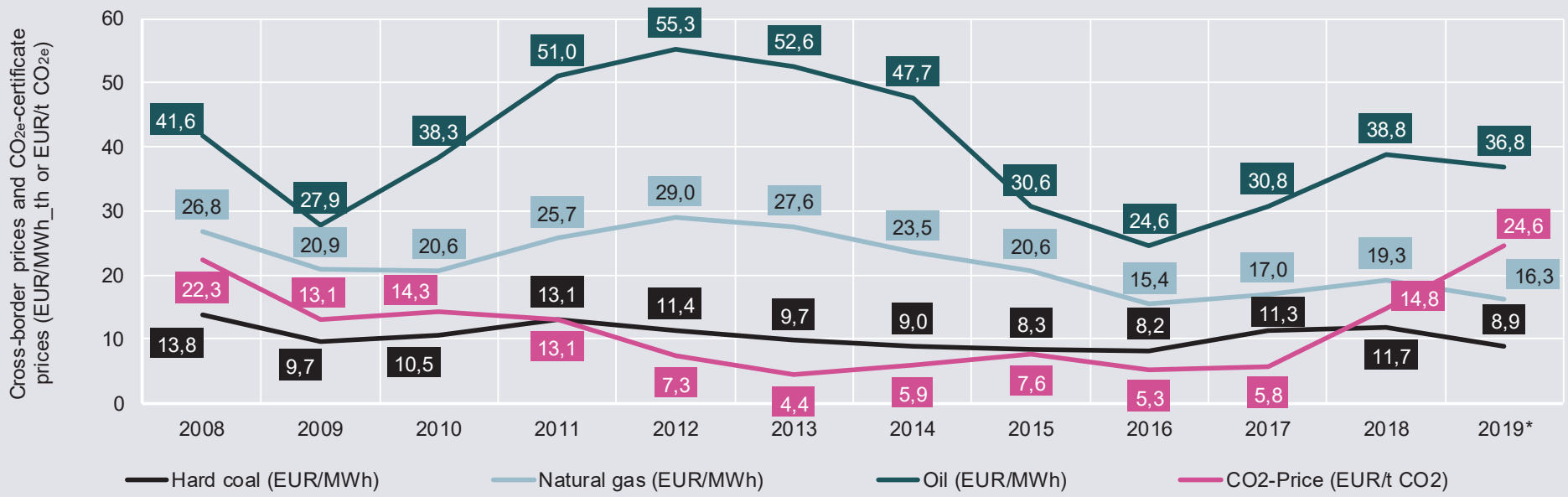
## Probably not. Here‘s why.

| | |
|---|---|
| 1 | **To reach the target we need to decrease emissions by another 60 million tonnes in 2020. The substantial decrease in the electricity sector might turn around, other sectors showed increasing emissions.** The decline in emissions is based mainly on the decrease of emissions in the electricity sector. And the decline in that sector might not be sustainable. The transport sector even increased its emissions. The buildings sector hasn‘t decreased emissions with mild conditions. |
| 2 | **The electricity sector’s emissions decline in 2019 will most likely <u>not</u> continue the same way in 2020**. Coal-Gas-Switch is not necessarily sustainable. If the $CO_2$-price goes down or the gas price goes up, this could go the opposite way. Decrease in consumption is not necessarily sustainable. The situation for PV and wind was above-average, this may also not be the case during the following year. |
| 3 | **A lack of electricity is to be replaced.** We need to replace 1.4 Gigawatt of nuclear power (Phillipsburg 2). The lack in additional onshore wind capacitiy now means a lack of additional generation in the future. |
| 4 | **Thus**, if the transport sector does not deliver, we have a cold winter, a below-average year for wind and PV, the gas price increases, the $CO_2$-price decreases, the lack of additional onshore wind capacity is not compensated for and/or the electricity consumption increases, we could even see rising emissions in the future. **It seems clearly unlikely that we will decrease emissions in 2020 on an even bigger scale than 2019.** |

# Fuel Price Trends in Germany in 2019

# Commodity prices in 2019: Prices of coal, oil and gas decrease, the price of $CO_2$ certificates reached the highest level seen in the past 10 years

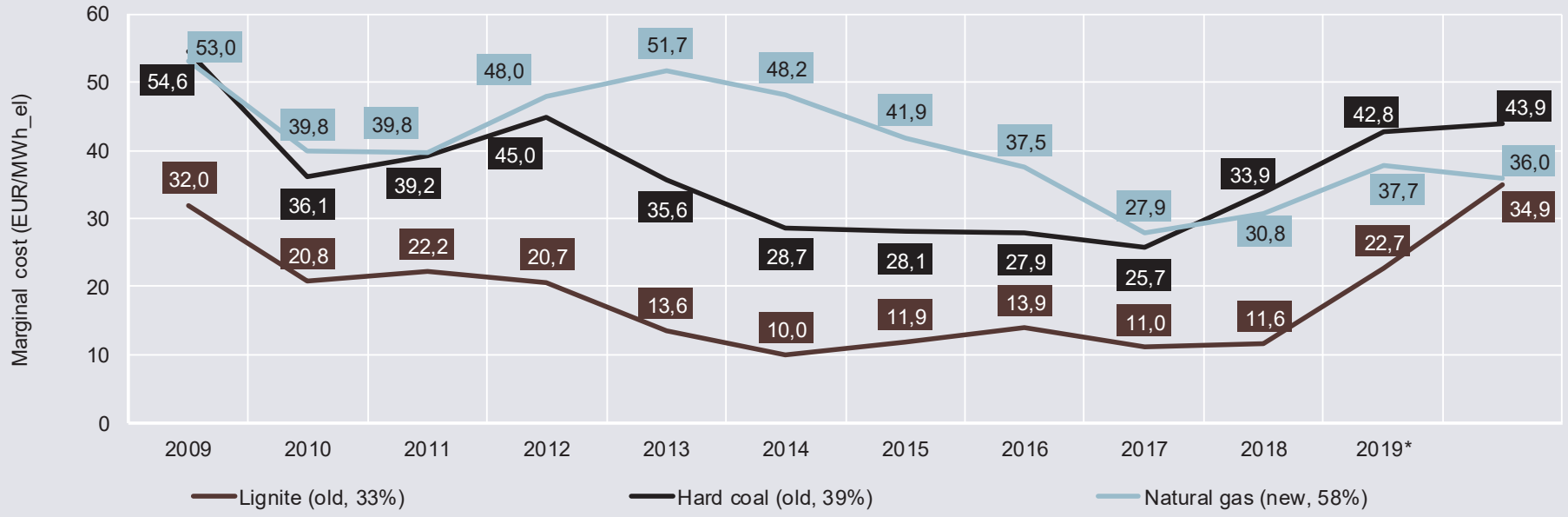
Import prices for natural gas, hard coal, and oil, as well as $CO_2$ certificate prices




Federal Office for Economic Affairs and Export Control (2019), Deutsche Emissionshandelsstelle (2019), own calculations, *preliminary results

# 2019 electricity generation costs: Due to higher $CO_2$ prices gas plants become as profitable as hard coal and even old lignite plants

Marginal costs for new natural-gas power plants and old power plants fired with lignite and hard coal

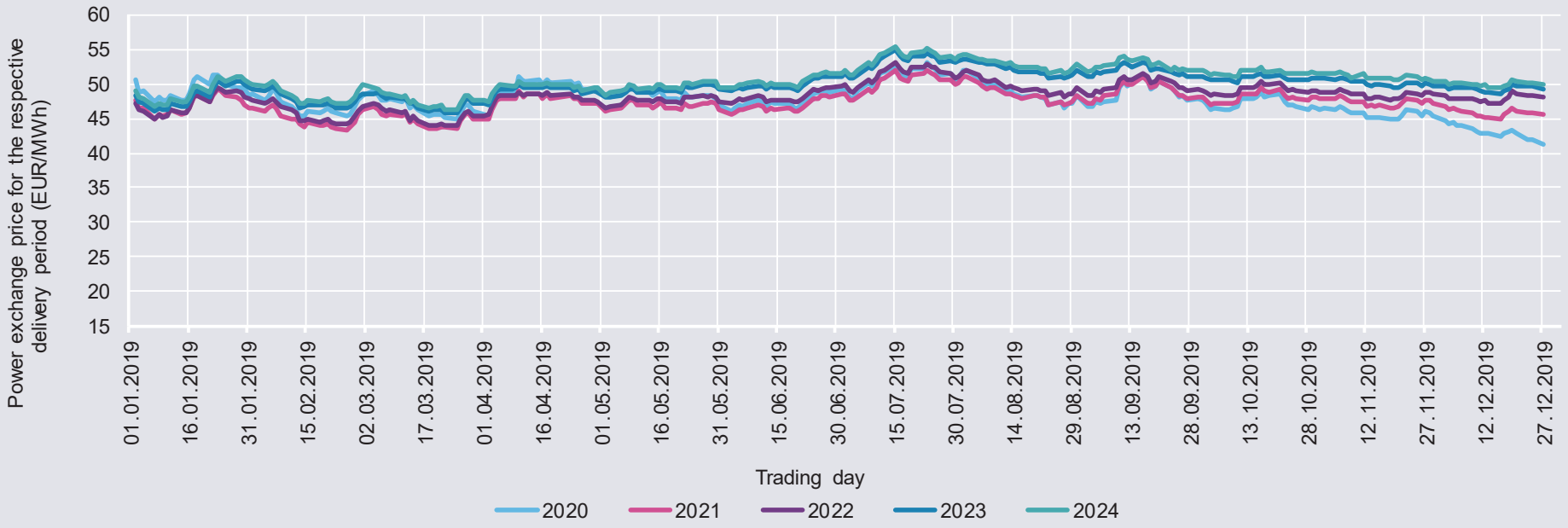



Federal Office for Economic Affairs and Export Control (2019), Deutsche Emissionshandelsstelle (2019/2006), Öko-Institut (2017), efficiency factor in brackets, *own calculations/preliminary data

# Electricity Prices and Power Market Flexibility in 2019

# Power future prices 2020-2024: In the future, electricity prices of around 50 to 55 Euros per megawatt hour are expected

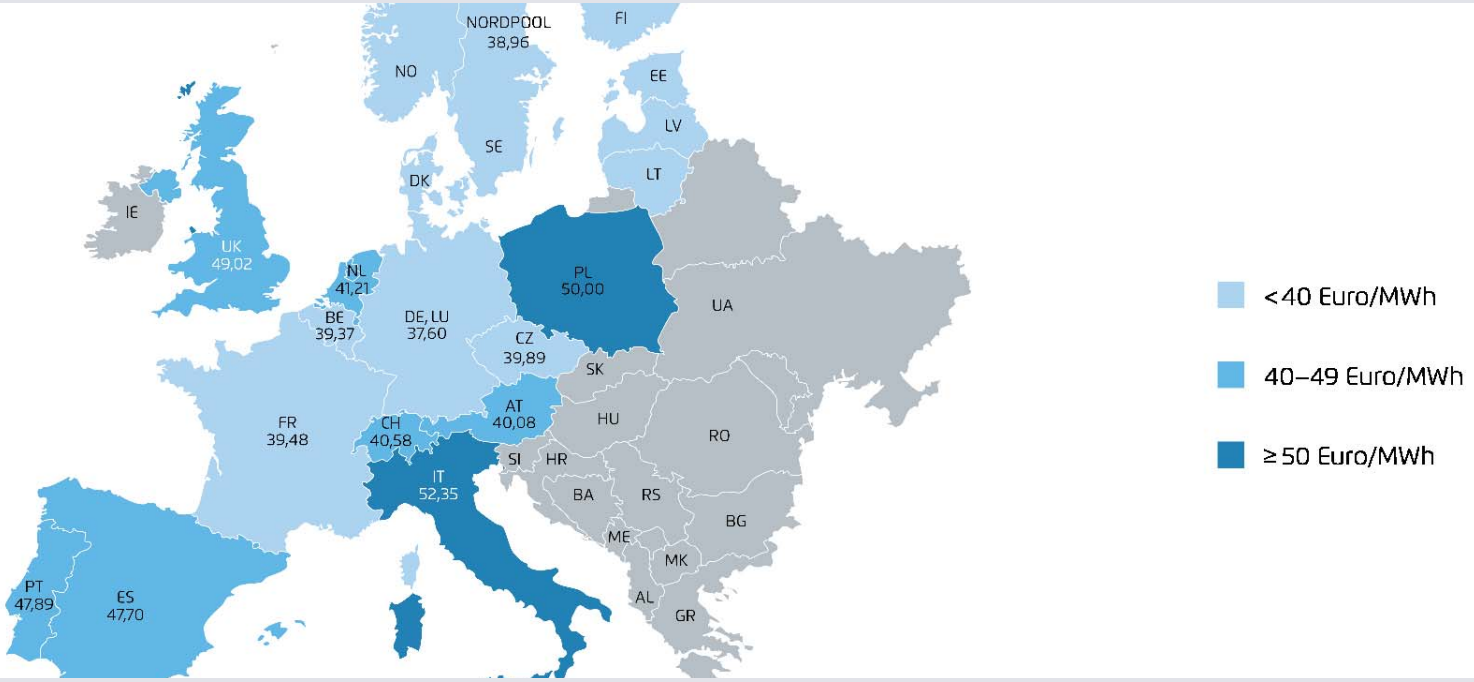
2019 future prices for power delivery in 2020–2024




EEX (2019, as of 30.12.19)

# Wholesale power prices: Germany has the lowest day ahead prices in Europe

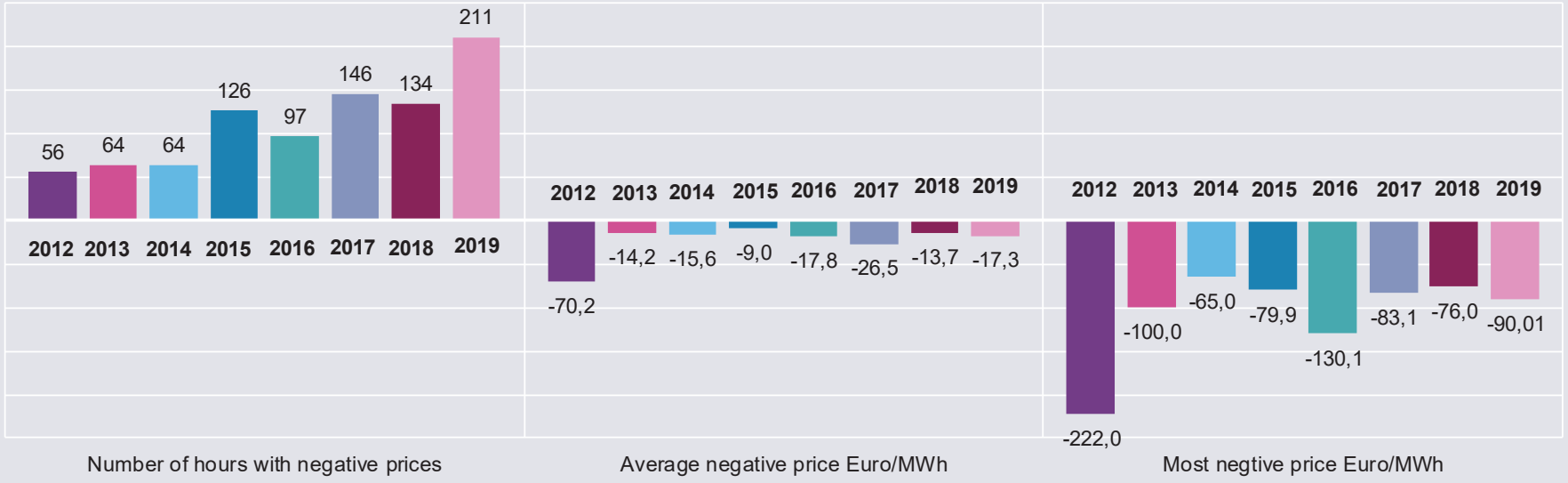
Comparison of wholesale power prices in selected European neighbouring countries




Own calculations based on ENTSO-E (2019), Mercato Elettrico (2019), Nordpool (2019), TGE (2019), OTE (2019), 30.12.19

# Negative electricity prices in 2019: High shares of renewables increase the number of hours with negative prices and show the potential for flexibility

Number of hours with negative electricity prices in 2019




ENTSO-E (2019, as of 30.12.2019)

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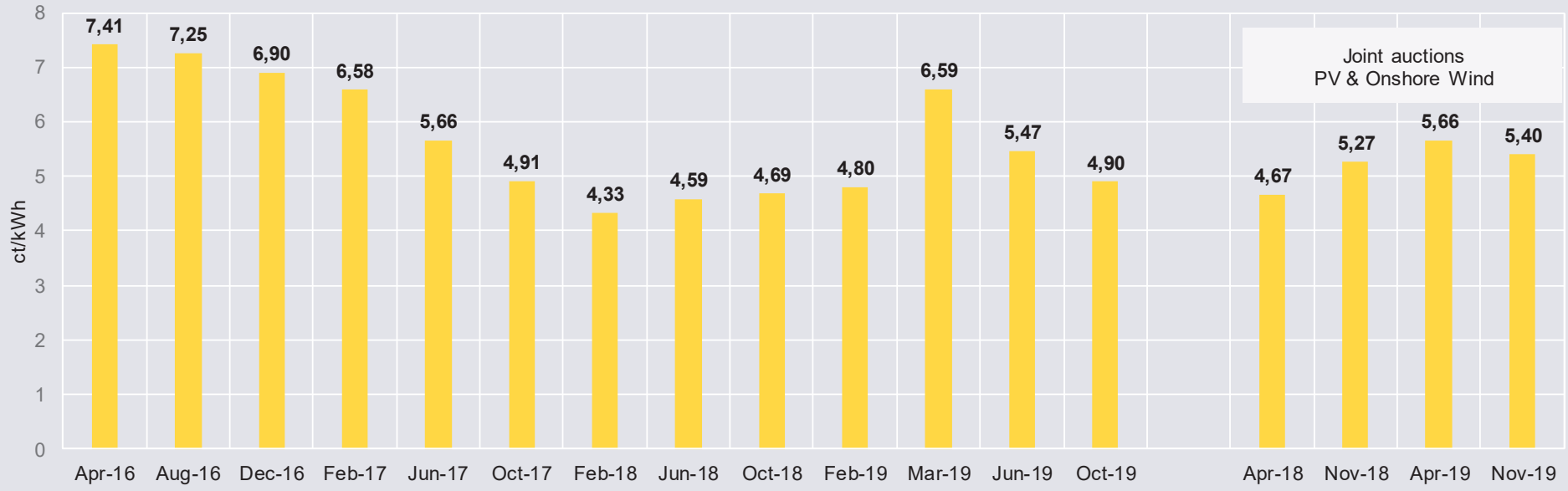
# Renewable Auctions and EEG levy costs in 2019

# Solar power auctions in 2019: After a peak in March the auction results declined to the level of 2018

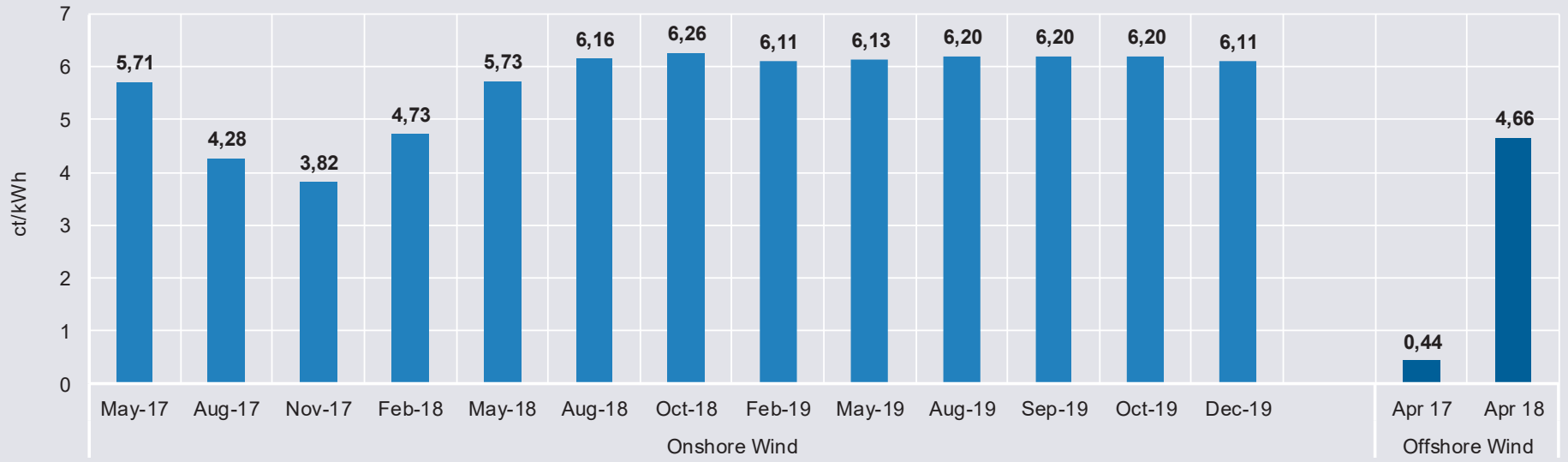
Average auction results for PV, 2016 - 2019




Bundesnetzagentur (2019)

# Average results of wind power auctions 2017 to 2019: Maximum values in the auction results reflect the lack of new projects in the market

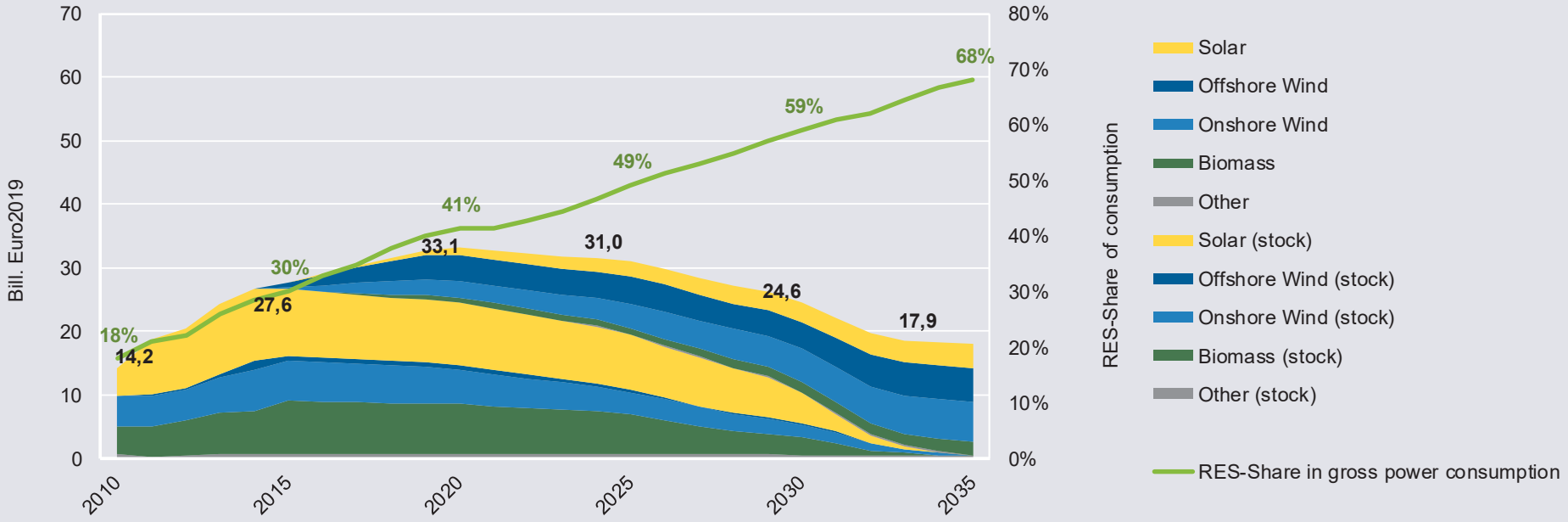
Average auction results for wind power, 2017 - 2019




Bundesnetzagentur (2019), * excluding grid connection costs (about 3 ct/kWh)

# Costs of promoting renewables: The peak is within sight, costs for the remuneration of renewable energy will decline in the beginning of the 2020s

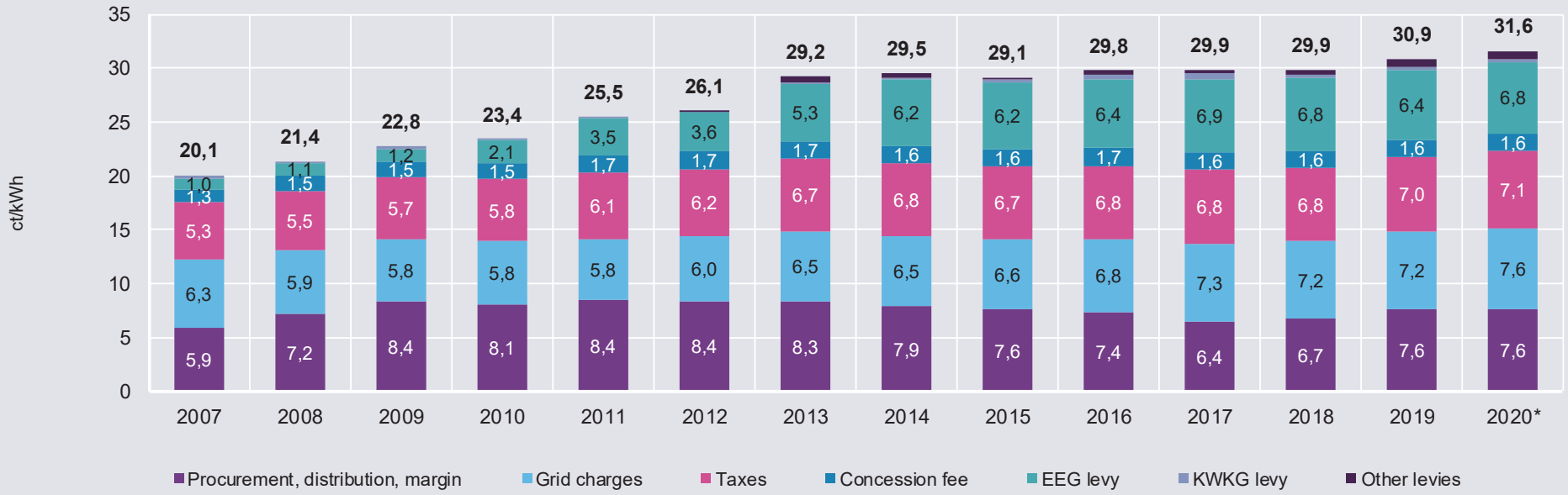
Guaranteed remuneration for renewable power plant owners, 2010–2035




Own projection based on Öko-Institut (2019)

# Electricity costs in 2020: Household electricity prices increase by 2.6 percent

Household electricity prices 2007 bis 2020




Bundesnetzagentur (2019), *own estimates based on Netztransparenz (2019)

# Political developments and outlook 2020

# Summary

# Key Findings

1. **In 2019 greenhouse gas emissions in Germany fell by over 50 million tonnes of $CO_2$ thanks to a sharp drop in lignite and hard coal generation which are now around 35% lower than in 1990**.
2. Meanwhile, $CO_2$ emissions from the buildings and transport sectors have risen due to an increase in oil and gas consumption. The decline in $CO_2$ emissions can be attributed to the higher $CO_2$ prices in the EU ETS, a significant increase in renewable generation and lower electricity consumption. The rising share of SUVs in the transport sector is responsible for rising emissions.
3.
4.

# Key Findings

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**2**

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**Renewable energy broke a new record, reaching almost 43 percent of electricity consumption. Unfortunately, the collapse in wind capacity expansions to less than one gigawatt per year means the energy transition is entering the 2020s with a heavy burden.**

Whilst annual growth in renewables has been consistently around15 terawatt hours in recent years, the lack of available space and permits for wind capacity puts its continuation in jeopardy. Decisive political action is now required if the 2030 renewable energy targets are to be achieved.

# Key Findings

1

**When it comes to the costs of renewable energy, the peak is in sight: the EEG levy will rise again in 2020 to 6.77 cents per kilowatt hour, but is expected to fall in 2022 at the latest, thanks to the lower costs of renewable energy.**

2

Older, more expensive power plants will then increasingly fall out of the support scheme. In addition, from 2021, part of the revenue from the Fuel Emission Trading Act (BEHG) will be used to reduce the EEG levy. As a result, the price of electricity is likely to fall slightly in the 2020s rather than rise.

3

4

# Key Findings

1

2

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**Surveys have shown that climate protection and the energy transition are the number one concern amongst German society in 2019, far ahead of immigration (2nd) and pensions (3rd). This fact is not reflected in the country's climate politics.**

For example, the climate package adopted by the German government in September is not sufficient to achieve the 2030 climate protection targets. There is a considerable need for improvement, particularly in the areas of transport, buildings and industry.

**Agora Energiewende**
Anna-Louisa-Karsch-Str.2
10178 Berlin, Germany

**T** +49 (0)30 700 1435 - 000
**F** +49 (0)30 700 1435 - 129
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# Thank you for your attention.

Do you have questions or comments? Please contact me:

fabian.hein@agora-energiewende.de

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