



---

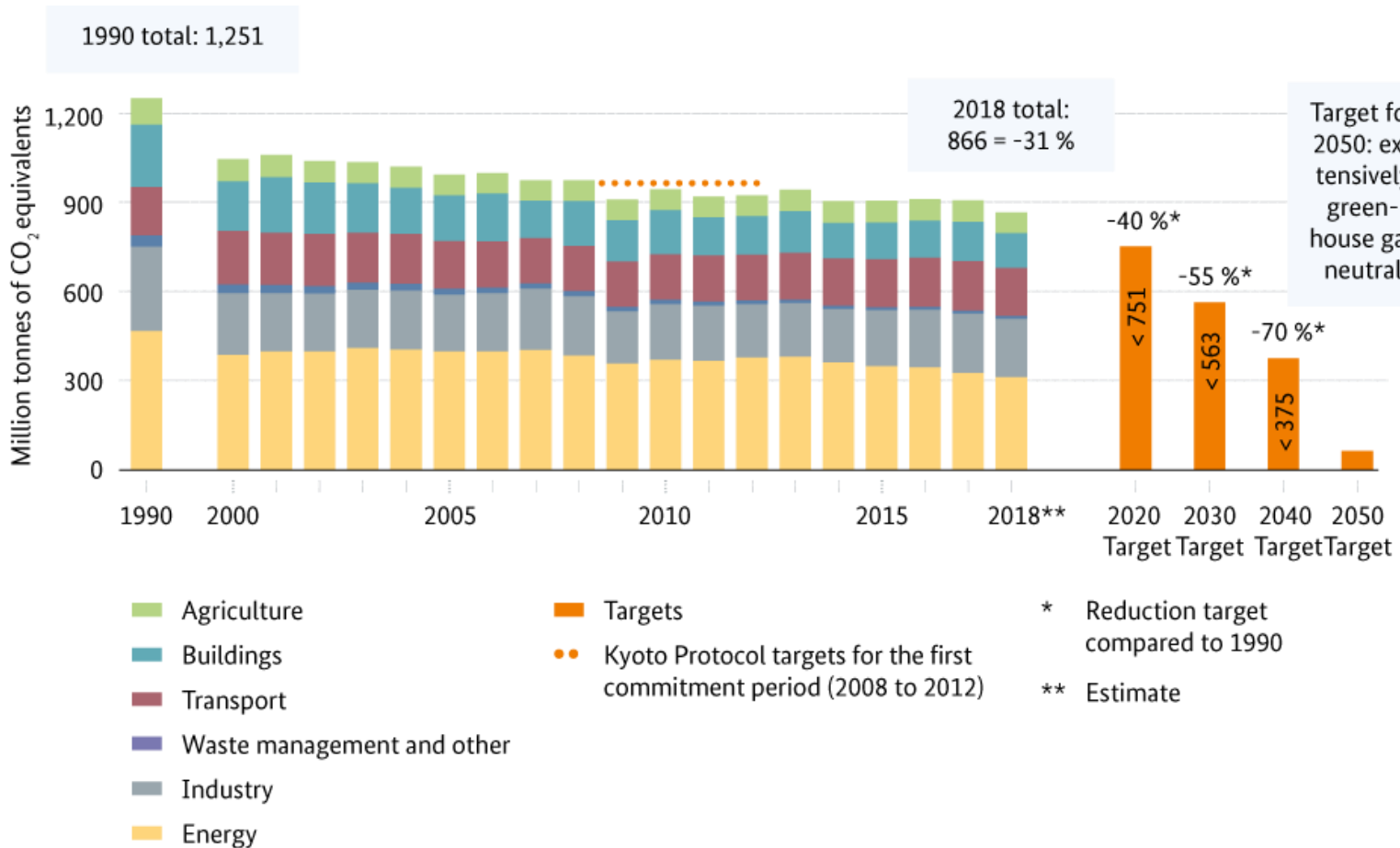
## *Mitigation policy leading to innovation*



Federal Ministry for the Environment, Nature Conservation and Nuclear Safety  
Malin Ahlberg



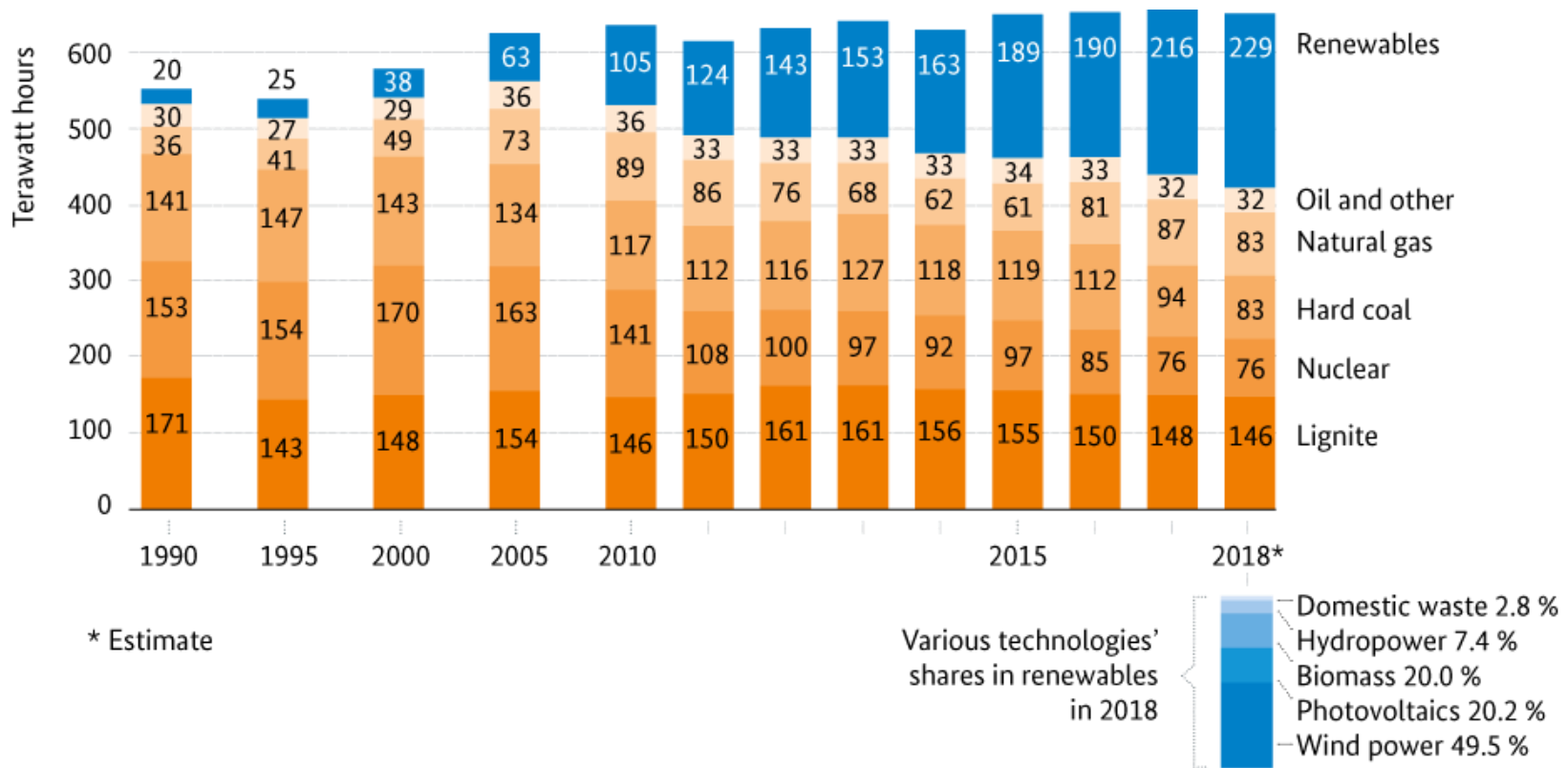
# ***Greenhouse gas emissions development in Germany by sector (excluding land use, land use change and forestry)***



Source: BMU Climate Action in Figures 2019, based on UBA (2019b), UBA (2019c)



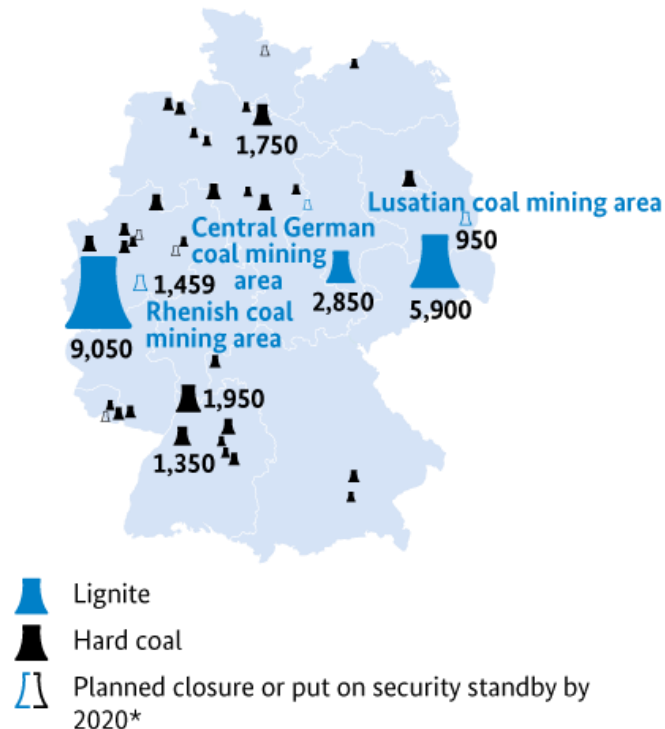
# Development of gross power generation by energy source



Source: BMU Climate Action in Figures 2019, based on BMWi (2019a)



# ***Currently installed capacities of lignite and hard coal power plants***



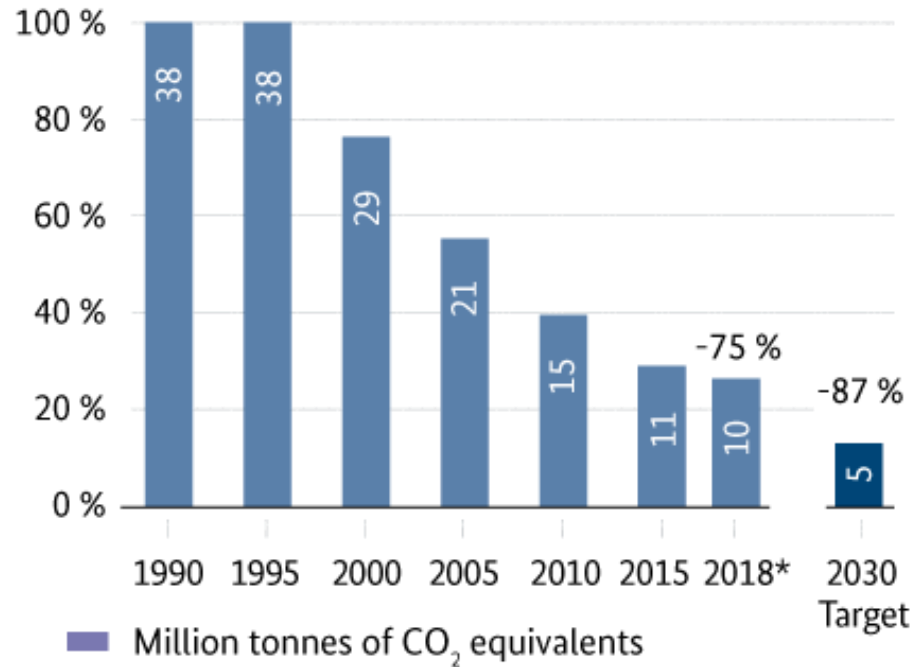
**1,234** Total capacities of multiple power stations in megawatts

\* Planned means the operators have told the Federal Network Agency that they want to close the plant

BMU Climate Action in Figures 2019



## ***Emissions development in waste management and other\*\****



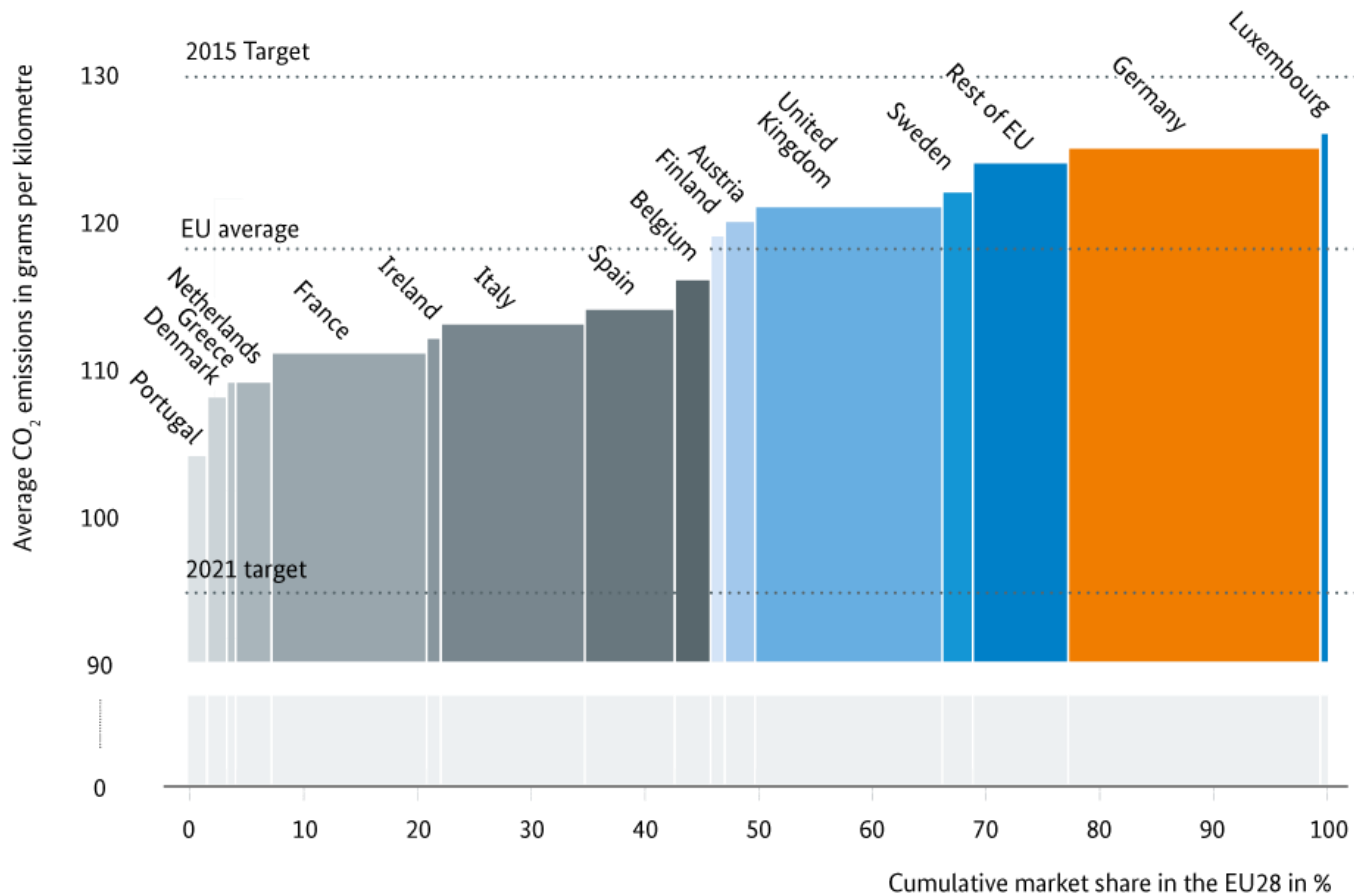
\* Estimate

\*\* Without credits from recycling and energy generation

Source: BMU Climate Action in Figures 2019, based on  
UBA (2019b), UBA (2019c)



## Average CO<sub>2</sub> emissions of passenger cars by EU Member State in 2017 and CO<sub>2</sub> limits for newly registered passenger cars\* in the European Union (NEDC)

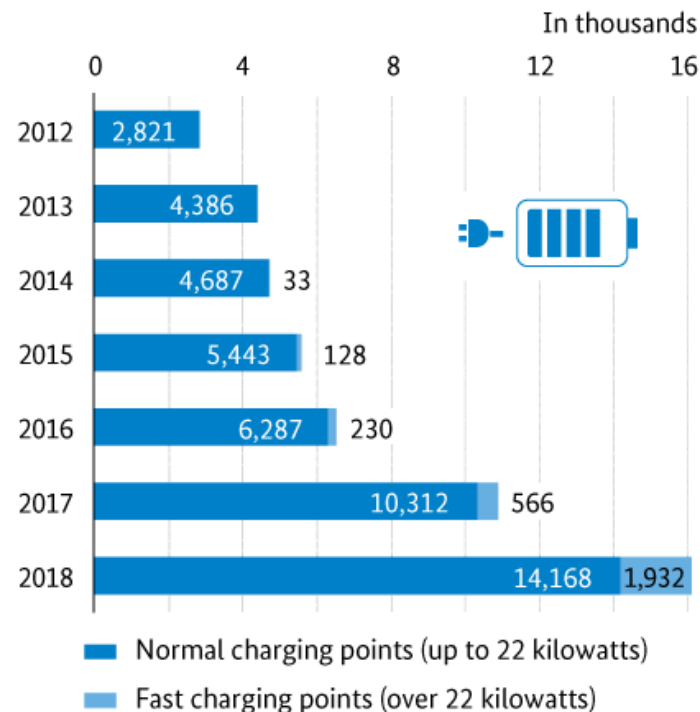


Source: BMU Climate Action in Figures 2019, based on EEA (2018b), ICCT (2018)

\* The CO<sub>2</sub> limit values apply to manufacturers.



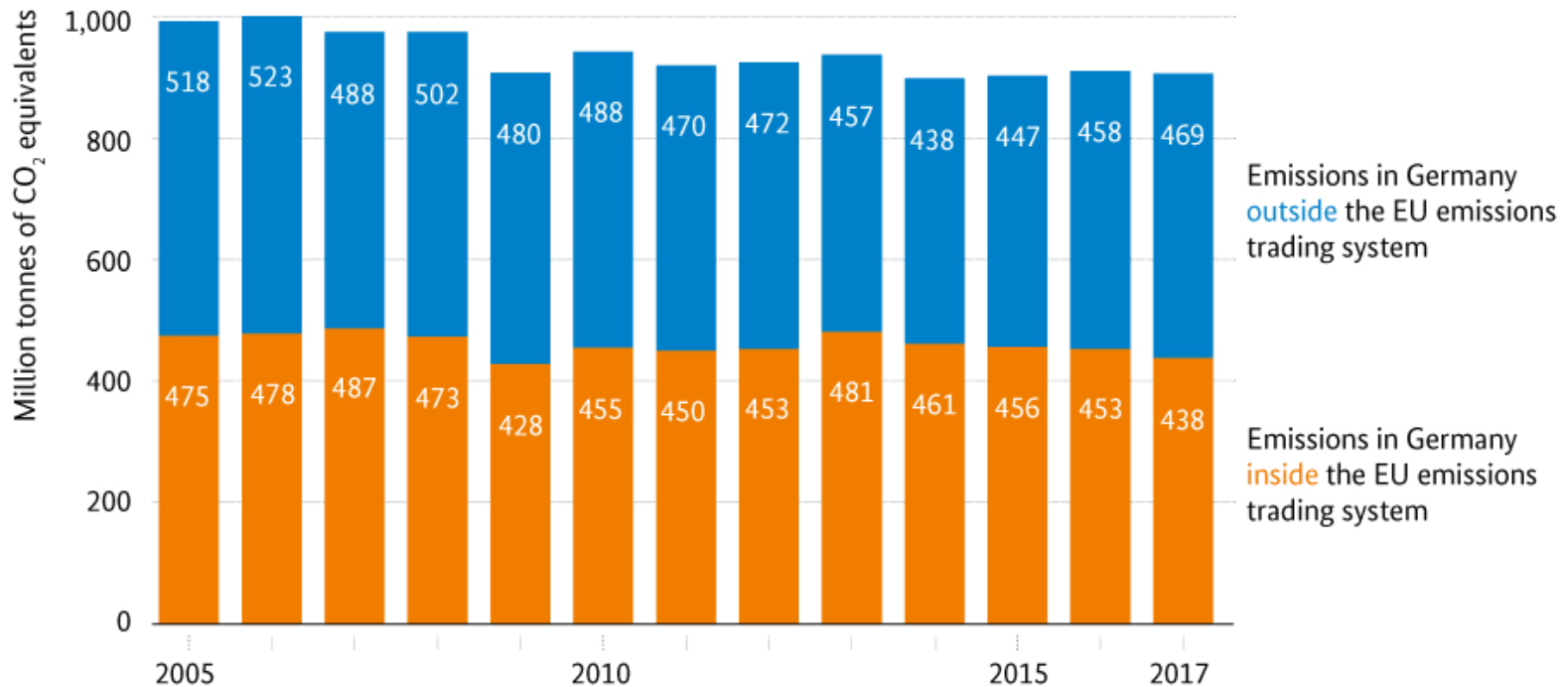
## ***Development of charging infrastructure for electromobility in Germany***



The Federal Government's goal is to install 100,000 additional charging points by 2020.



## ***Emissions development inside and outside the EU Emissions Trading System***



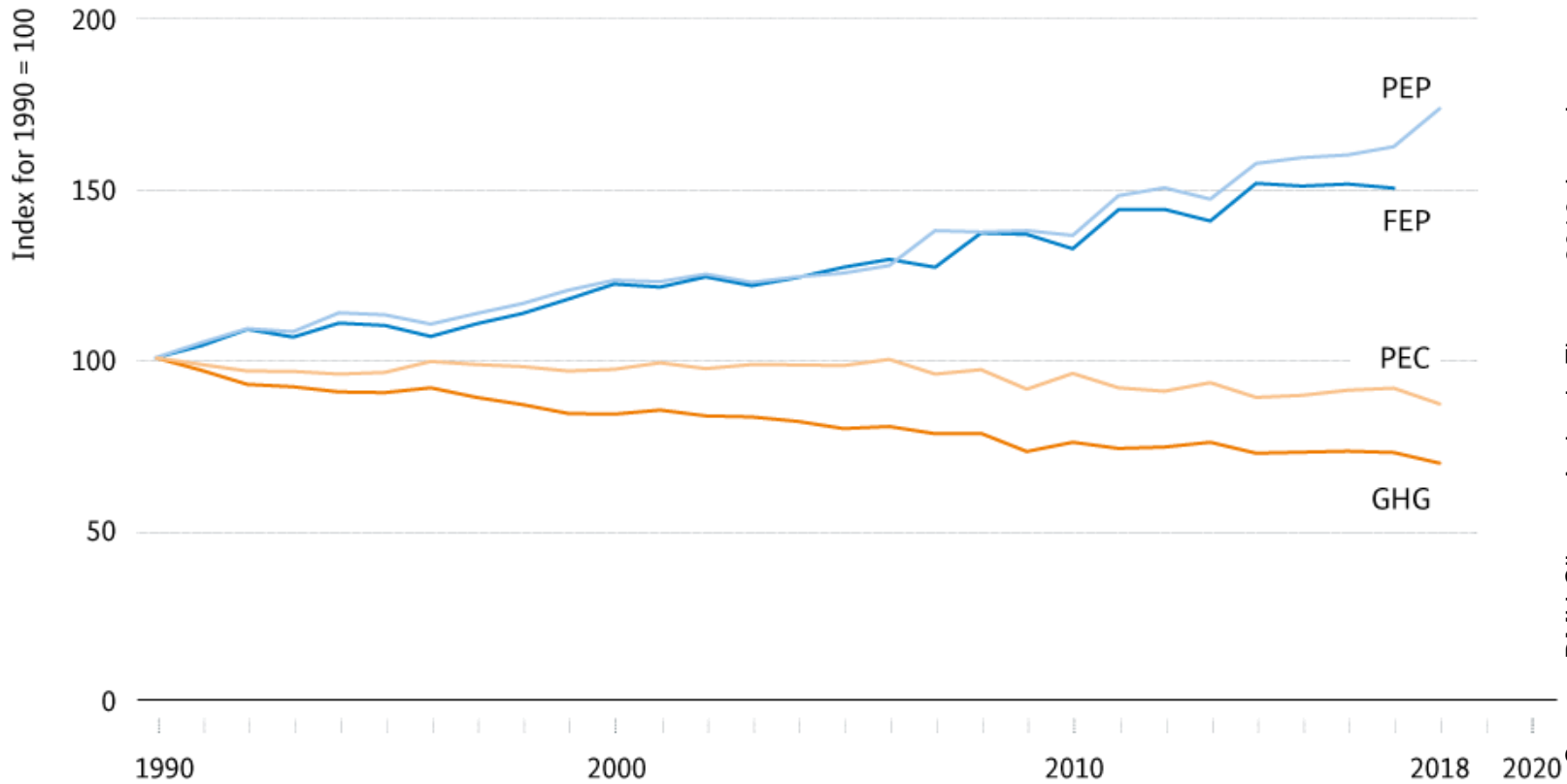
Source: BMU Climate Action in Figures 2019, based on UBA (2019b), EEA (2018a)

Emissions values in emissions trading between 2005 and 2012 do not fall within the current emissions trading framework.





# ***Decoupling of economic growth, greenhouse gas emissions and energy productivity***

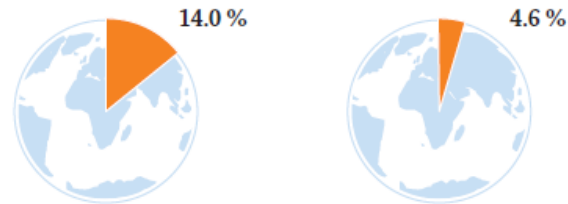


Source: BMU Climate Action in Figures 2019, based on UBA (2019d)

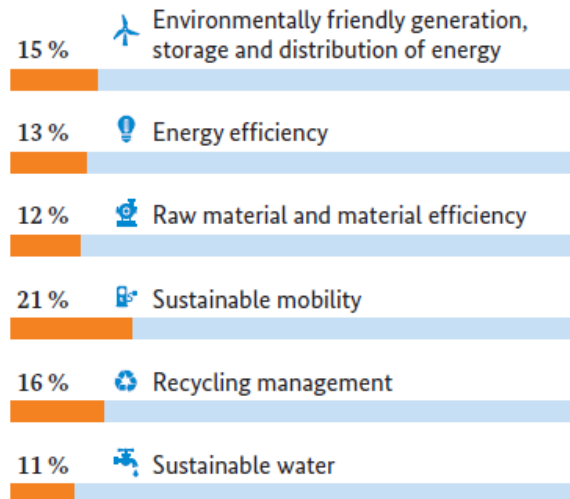
- Primary energy productivity (PEP)
- Final energy productivity (FEP)
- Primary energy consumption (PEC)
- Greenhouse gas emissions (GHG)



## ***Germany's share in the global environmental technology and efficiency market (left) and in global economic output (right) 2016***



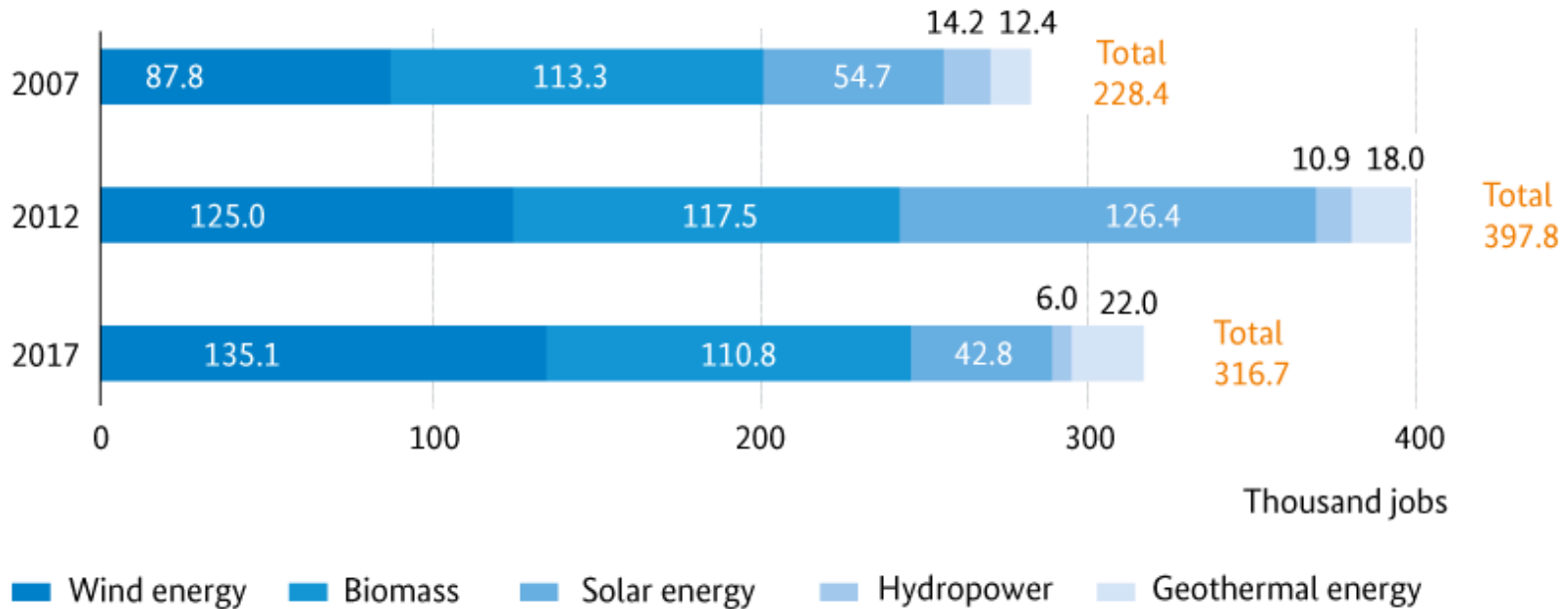
### German businesses' share of the global market for environmental technology and energy efficiency



Source: BMU Climate Action in Figures 2019, based on BMU (2018b)



## ***Development of gross employment due to renewable energy sources in Germany***



Source: BMU Climate Action in Figures 2019, based on  
BMW i (2018a)



# ***Conclusion***

---

In the period 1990-2016, EU GDP grew by 53%, while total GHG emissions decreased by 23%. This trend is also valid for Germany.

Measuring the specific effect of a carbon price on low-carbon economic development is complex due to many external factors (e.g. policies supporting renewable energy and energy efficiency).

Evidence shows that the EU ETS provides an incentive for the deployment of existing (more efficient) technologies as well as incremental innovation and patenting.



# ***Conclusion***

---

Until now, there is no evidence of the EU ETS driving more fundamental innovation (level of price?).

In case of Germany: The breakthrough of renewables was mainly driven by feed-in tariffs, and decrease price of technology.

The carbon price provides the incentive to continue to invest in low-carbon technologies.

Carbon pricing policy provides also the opportunity to use the revenues to induce low-carbon innovation.



---

***Thank you for your attention!***



Internet: <http://www.bmub.bund.de/en/topics/climate-energy/climate/>

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety