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The European Power Sector in 2020:

Up-to-Date Analysis on the Electricity Transition

“Renewables overtake fossils”

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Grace Alster**

BERLIN, LONDON, 4 FEBRUARY 2021



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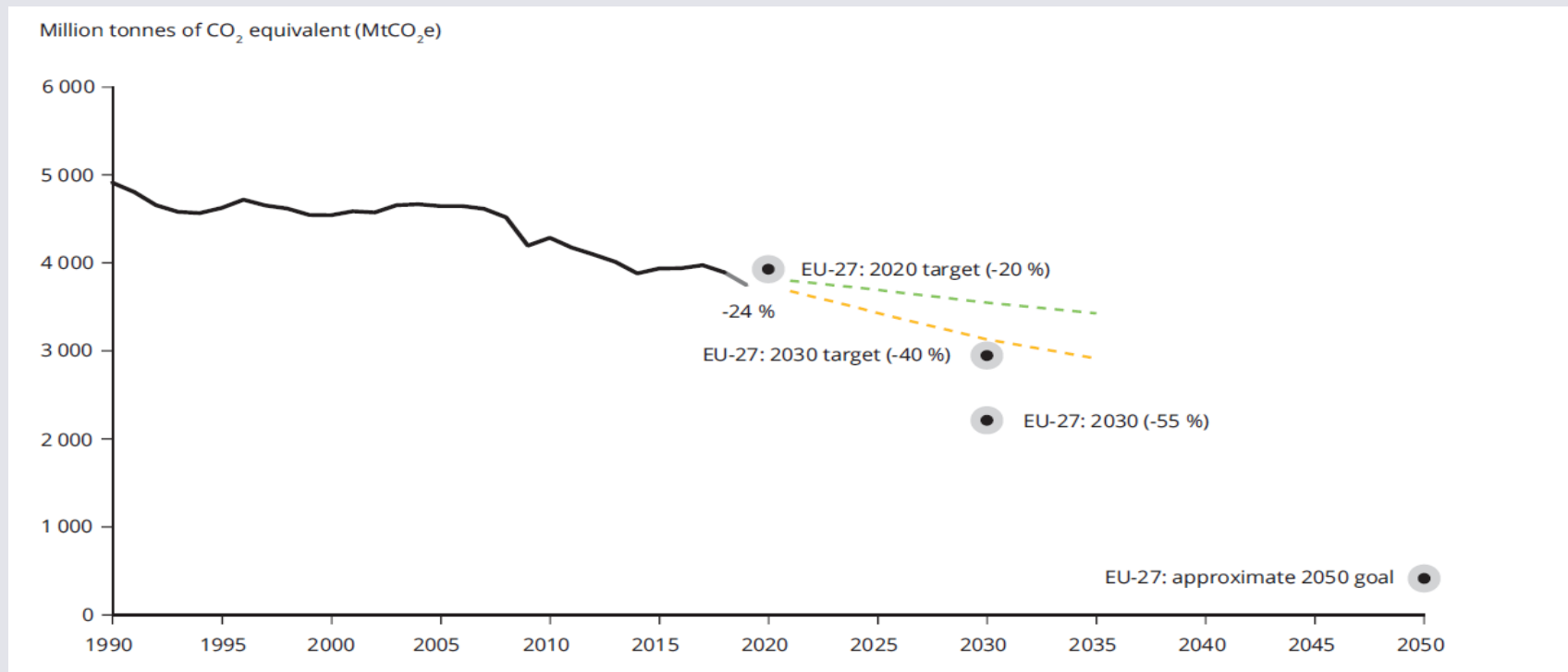


Context: The EU Green Deal



To reduce EU ghg-emissions by 55 percent by 2030, emissions must be reduced in the next 10 years as much as in the past 30

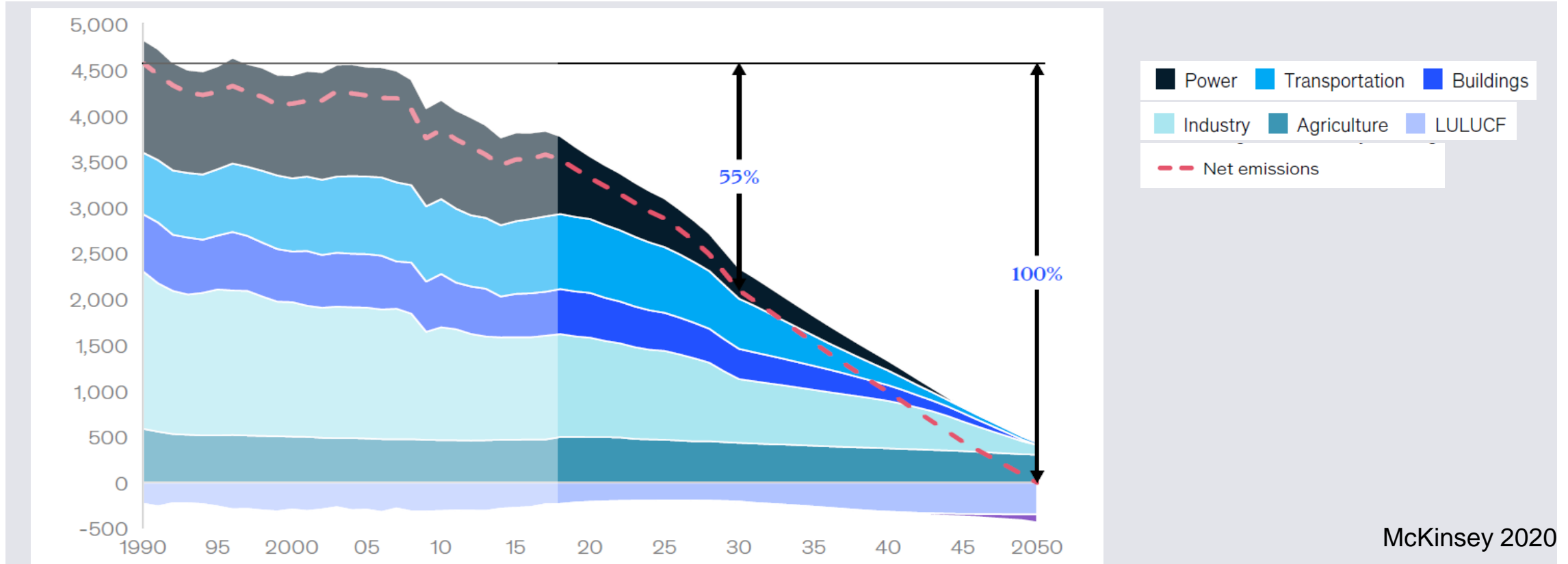
Old and updated 2030 EU greenhouse gas reduction targets on the way to climate neutrality by latest 2050



EEA 2020

All studies find that the most efficient way to reach this target is to decarbonize the power sector quickly

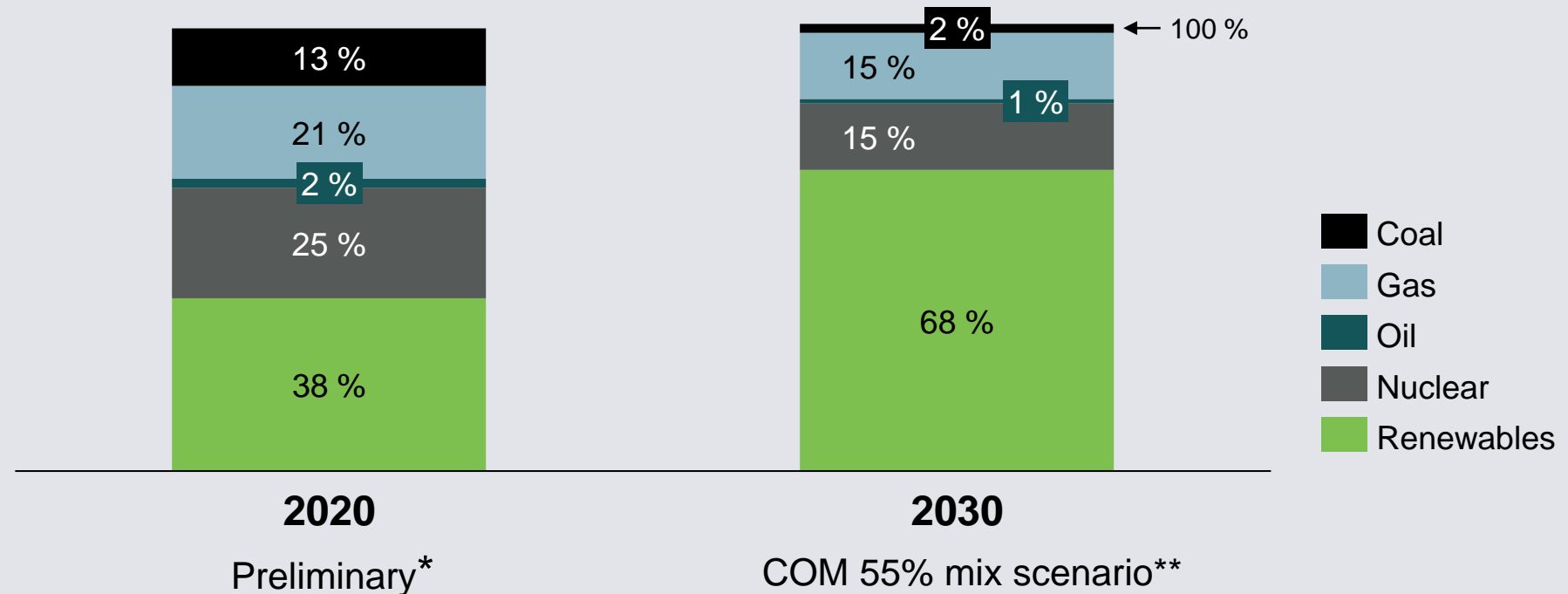
McKinsey's Climate Neutral Europe scenario



McKinsey 2020

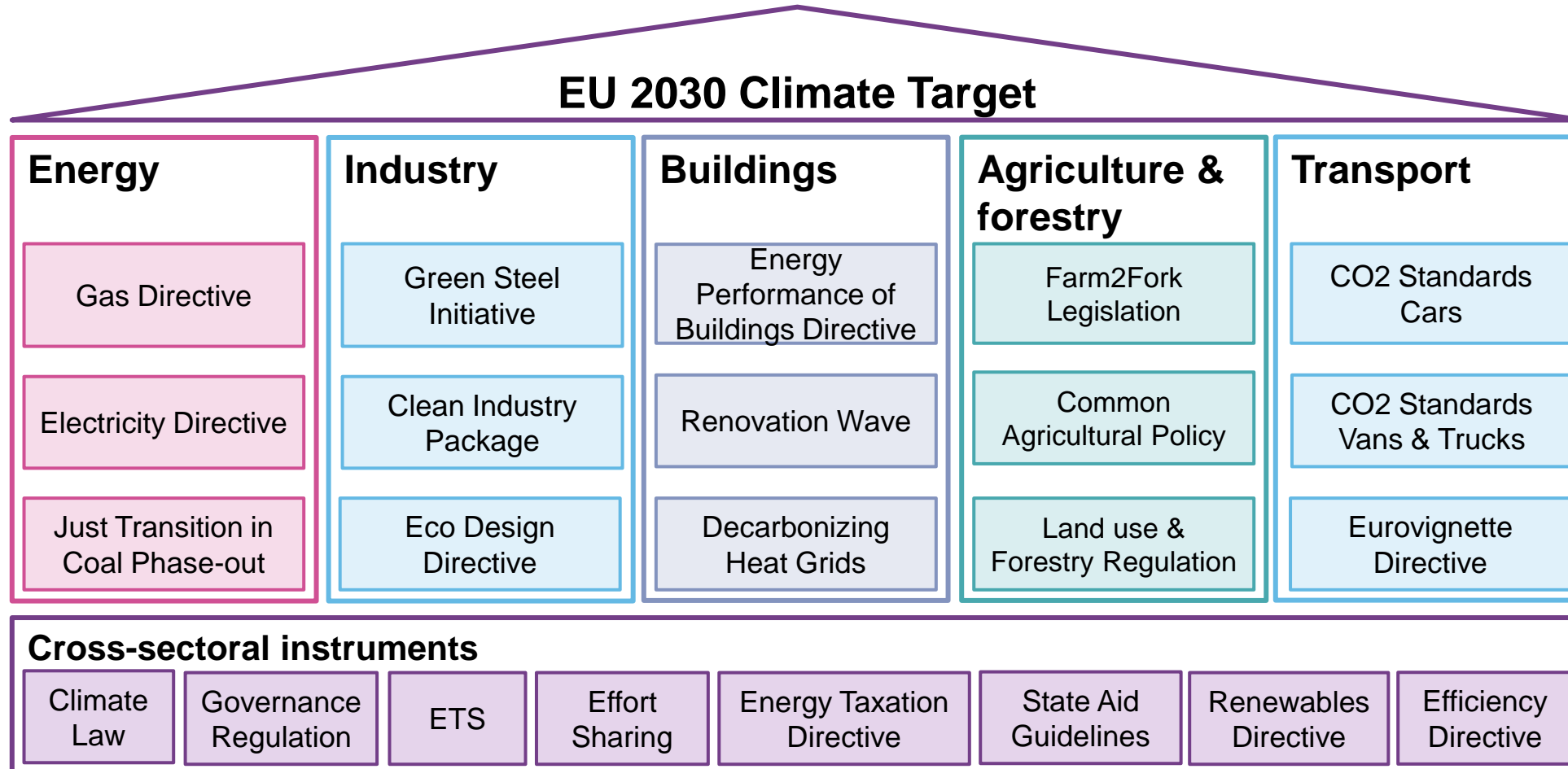
By 2030, the renewables share in electricity will rise to around 70 percent and coal will be phased-out almost completely

Gross power mix EU-27, (%), 2020 vs 2030



Ember/Agora Energiewende (2021), ** [Ecologic & Climact \(2020\)](#)

Starting in June 2021, European climate and energy laws will be revised. A 55%-consistent EU climate and energy framework will be in place by the end of 2023.



*Selection of EU policy instruments under consideration for introduction or revision under the EU Green Deal





Report findings



Where is the data from?

Data Sources and Methodology

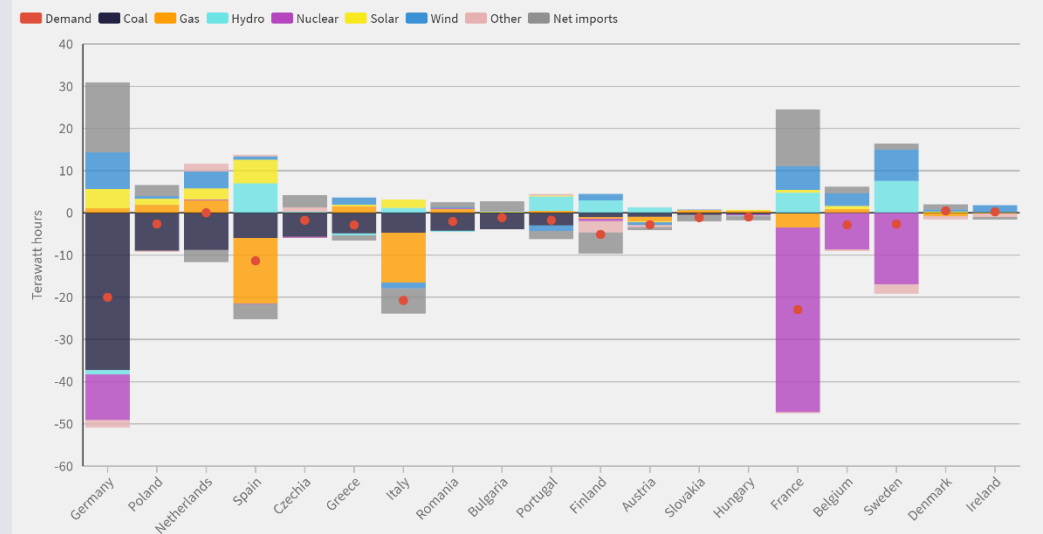
	Germany	Italy	Poland	Spain	Finland	Netherlands	Other
2000 - 2018							
2019							
2020							

-  AG Energiebilanzen
-  Eurostat yearly data
-  ENTSO-E combined with local TSO
-  ENTSO-E

2018 Eurostat figures adjusted by year-on-year changes from other data sources

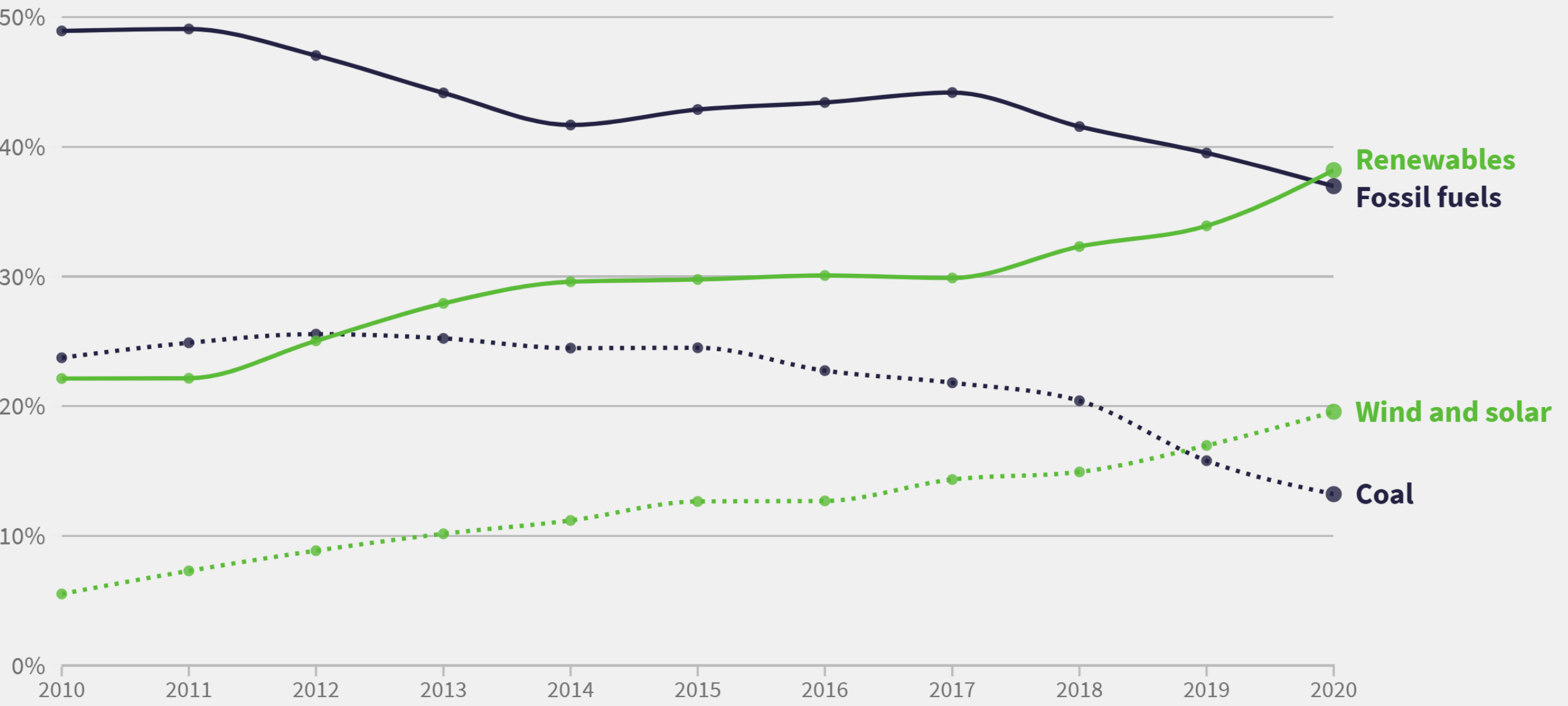
Changes to generation in 2020

Year-on-year electricity generation change

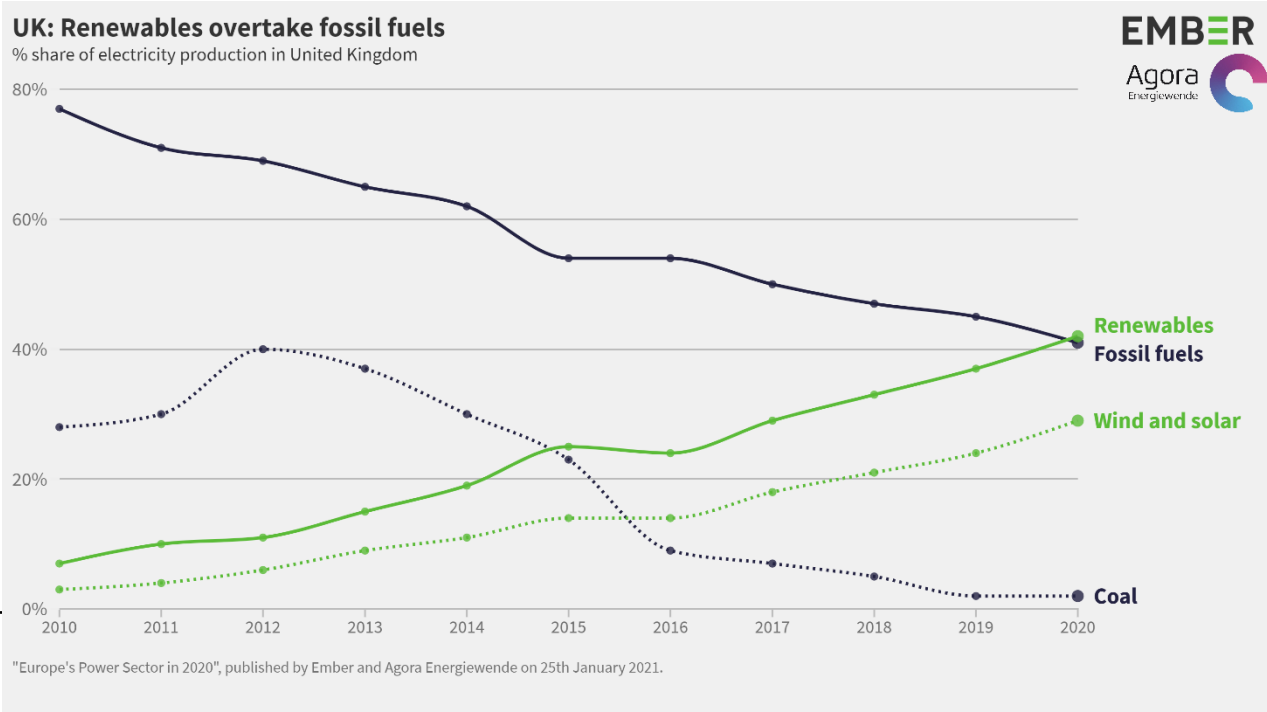
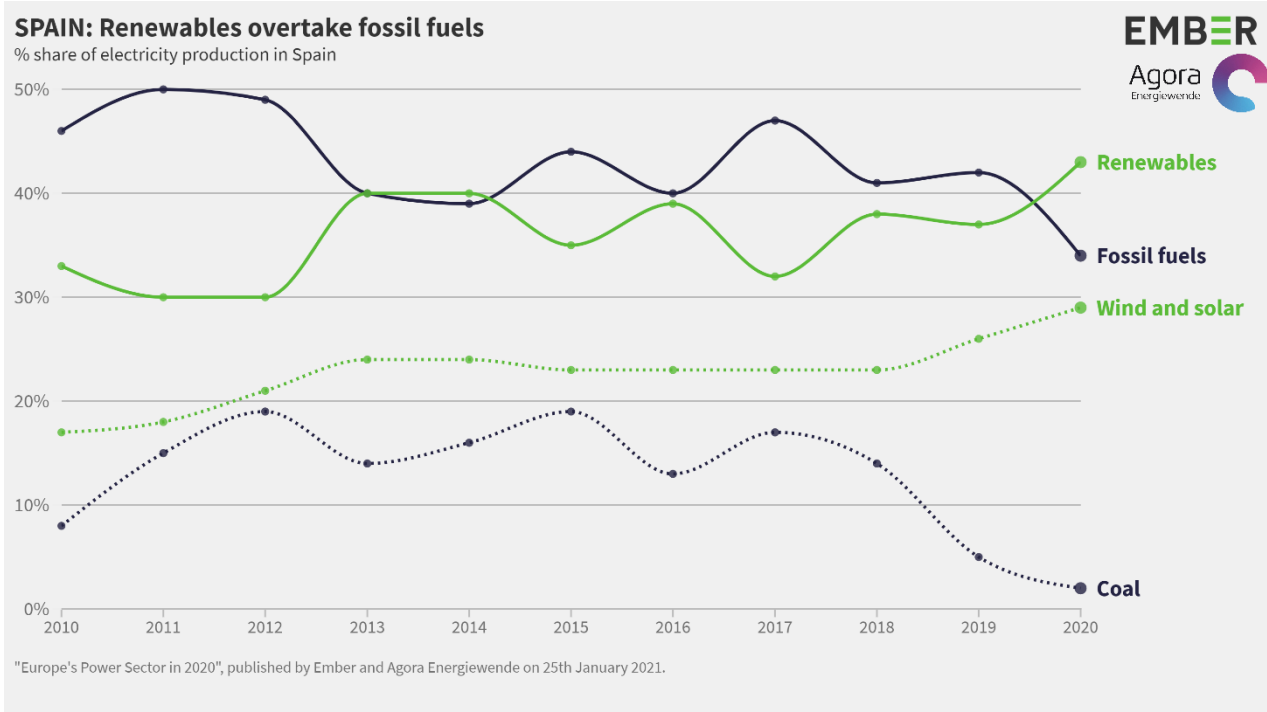
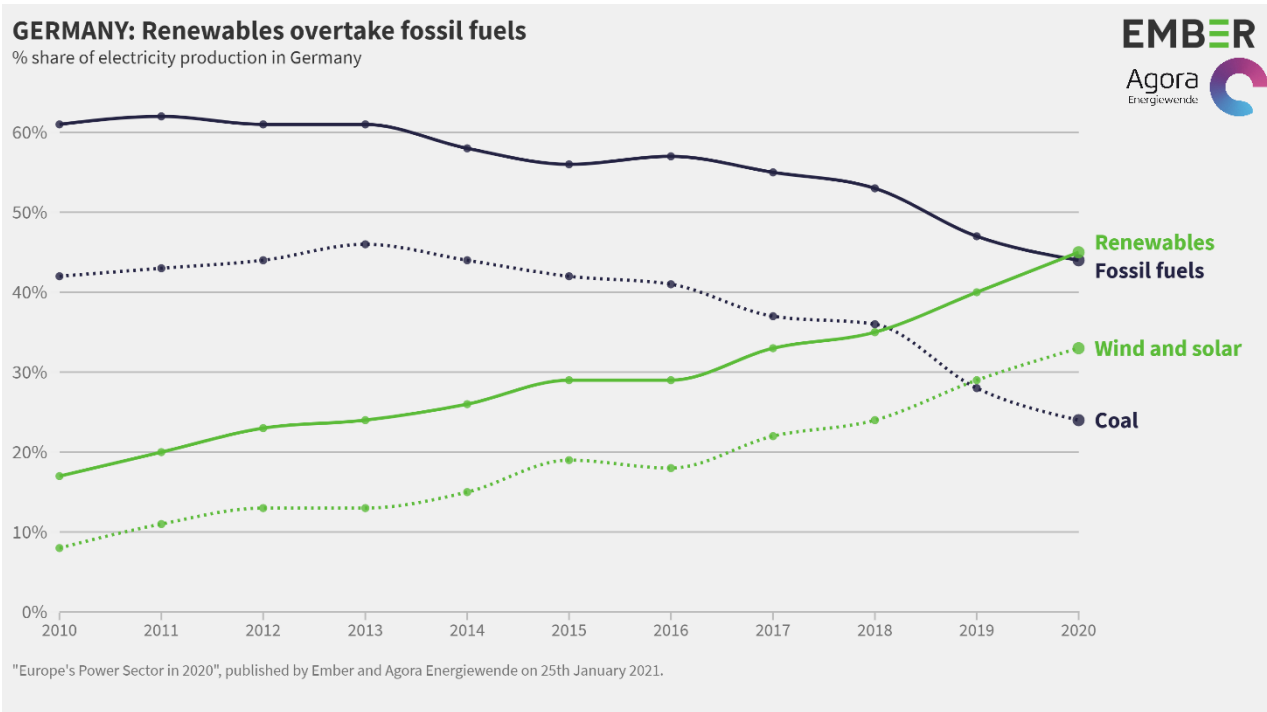
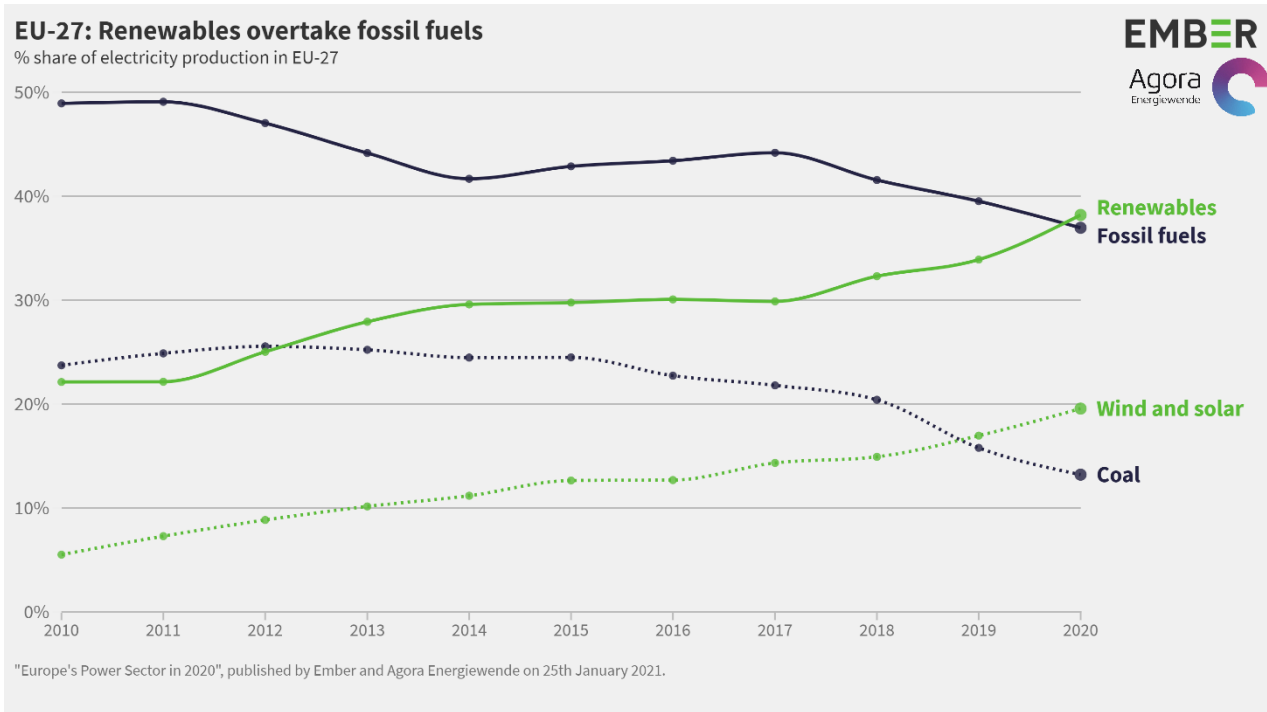


Renewables overtake fossil fuels

% share of electricity production in EU-27



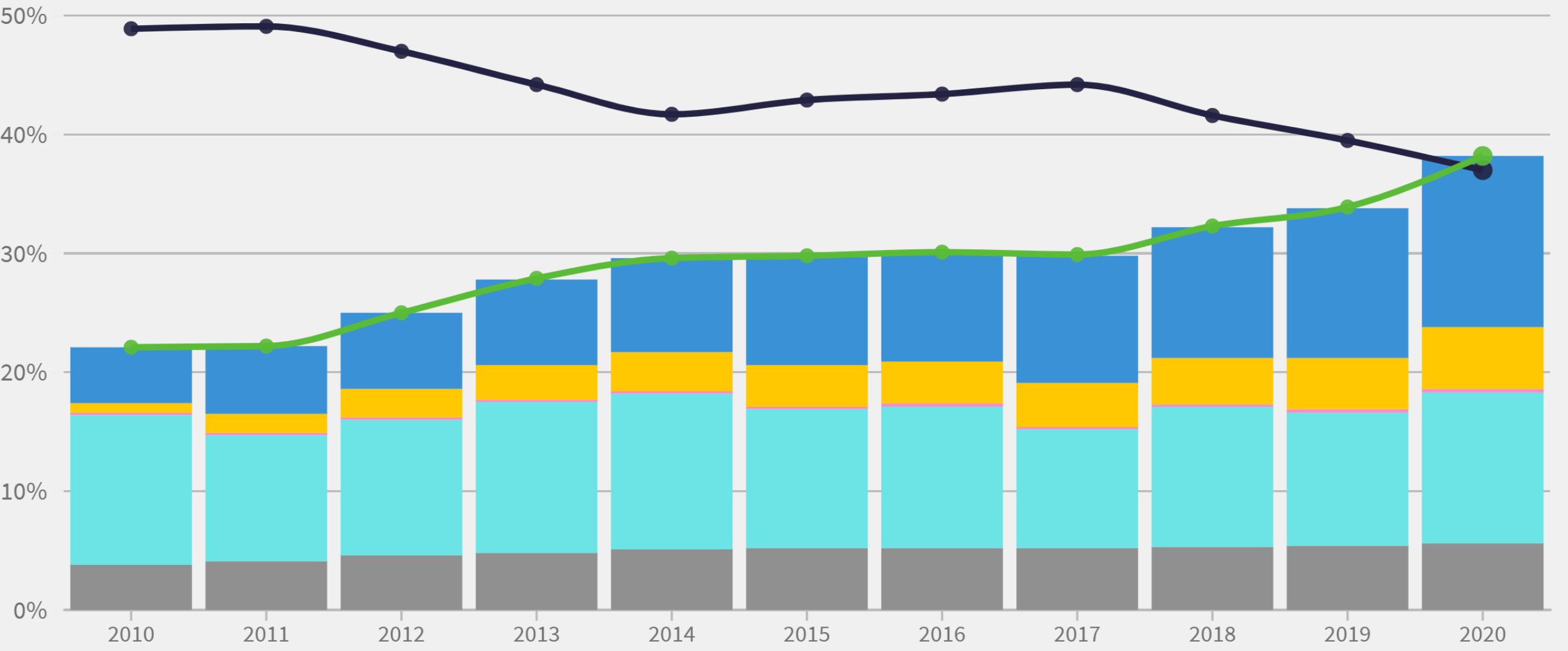
"Europe's Power Sector in 2020", published by Ember and Agora Energiewende on 25th January 2021.



Renewables growth driven by wind and solar

% share of electricity production in EU-27

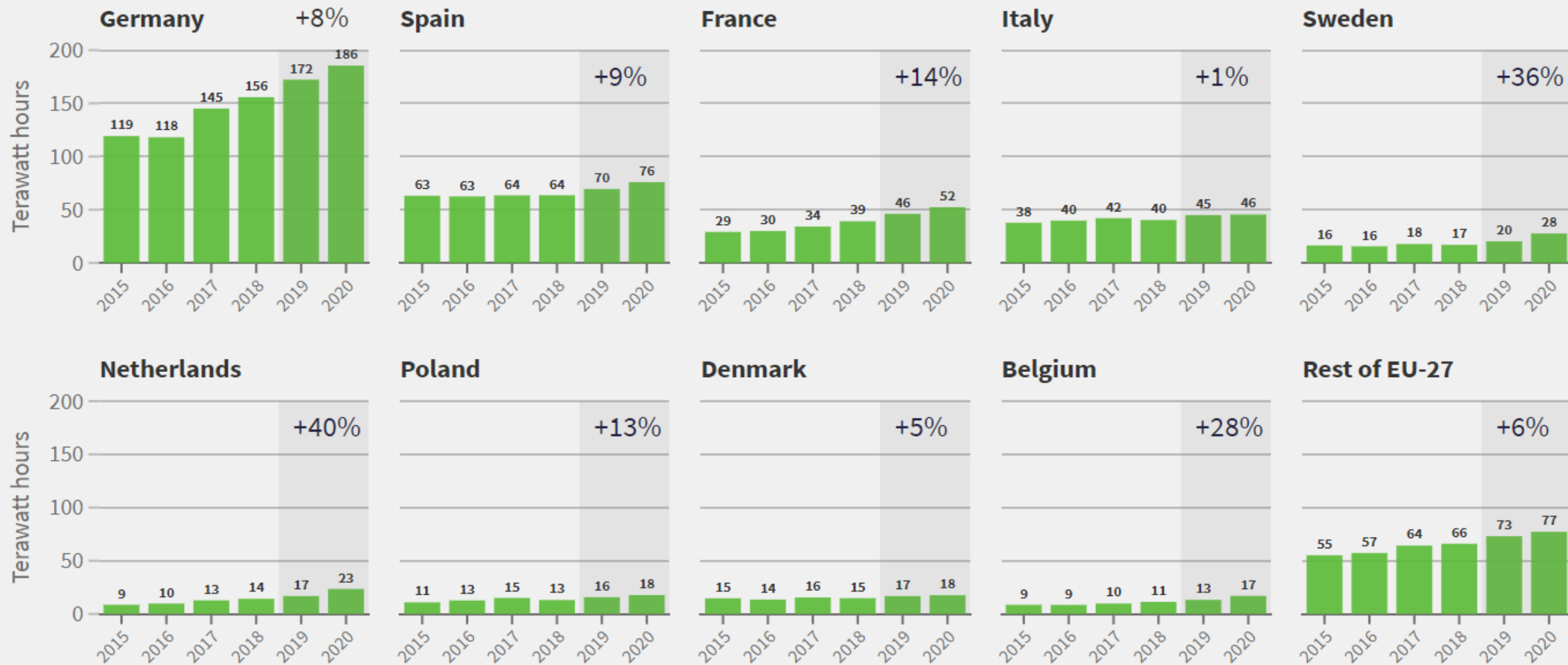
Fossil fuels Renewables Bioenergy Hydro Other renewables Solar Wind



Europe's Power Sector in 2020, published by Ember and Agora Energiewende on 25th January 2021.

Wind and solar continues its rise

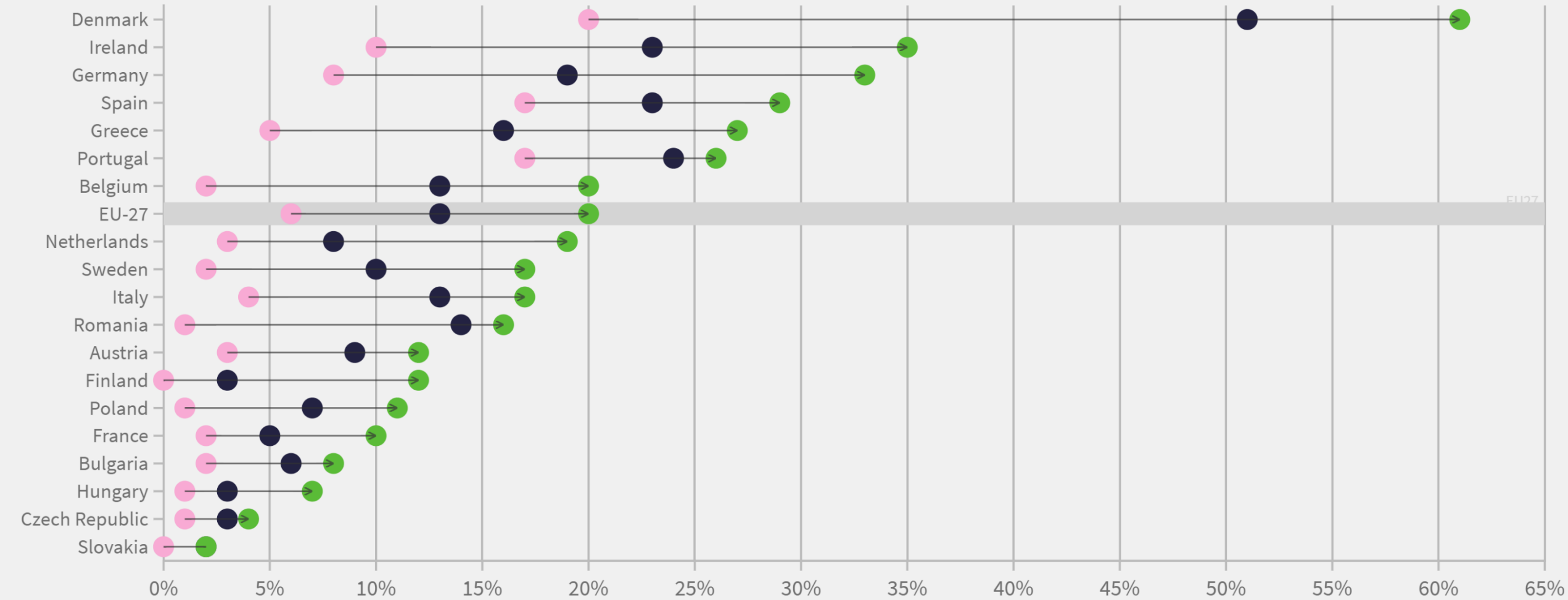
Wind and solar generation (bars), percentage change from 2019 to 2020 (shaded)



Wind turbines and solar panels now make a fifth of all Europe's electricity

Wind and solar as percentage share of electricity production

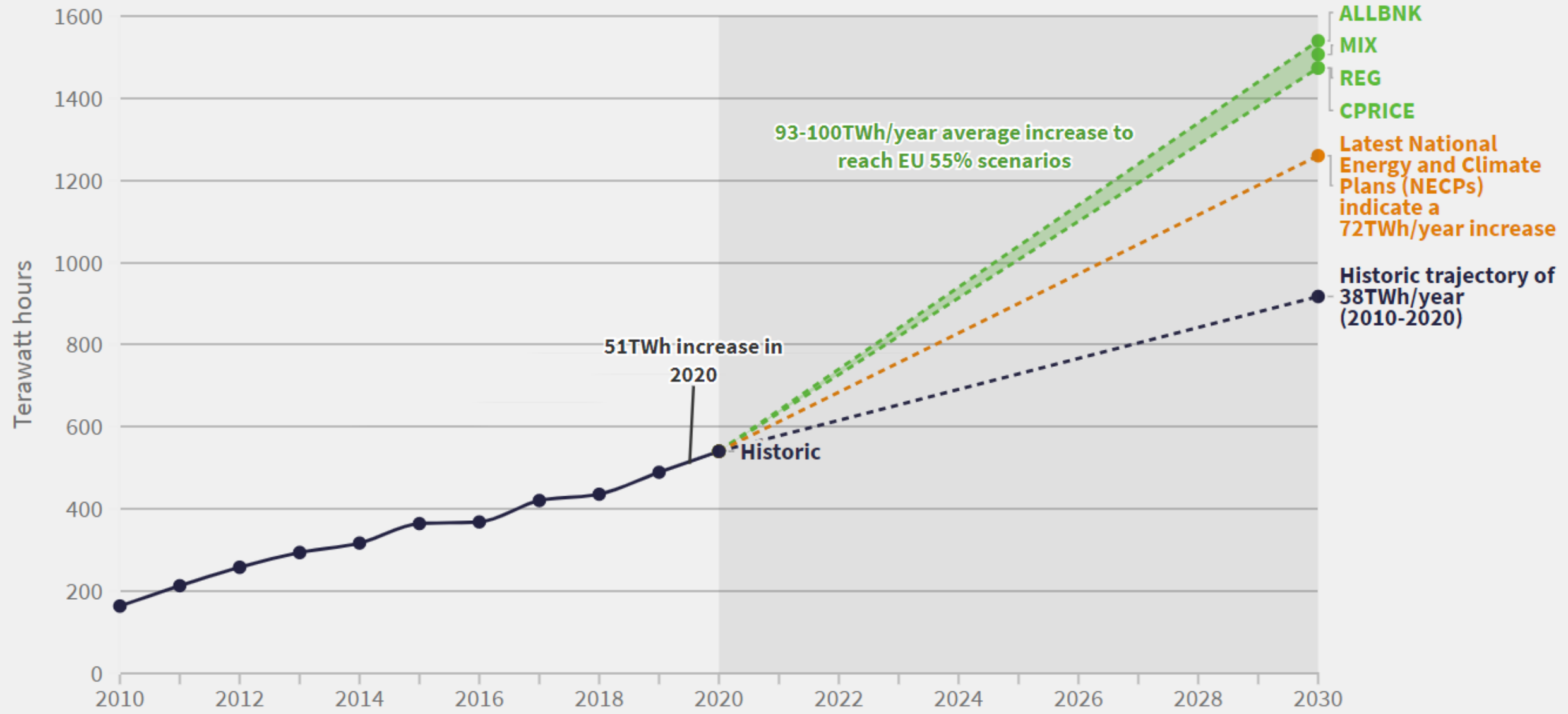
Year ● 2010 ● 2015 ● 2020



Europe's Power Sector in 2020, published by Ember and Agora Energiewende on 25th January 2021.
The 19 countries displayed account for > 97% of EU-27 electricity consumption

Wind and solar growth must almost triple to reach EU climate target

EU-27 generation from wind and solar



Source: 2030 scenarios from European Commission's Impact Assessment for 55% GHG cuts under Europe's Green Deal (figure 46).

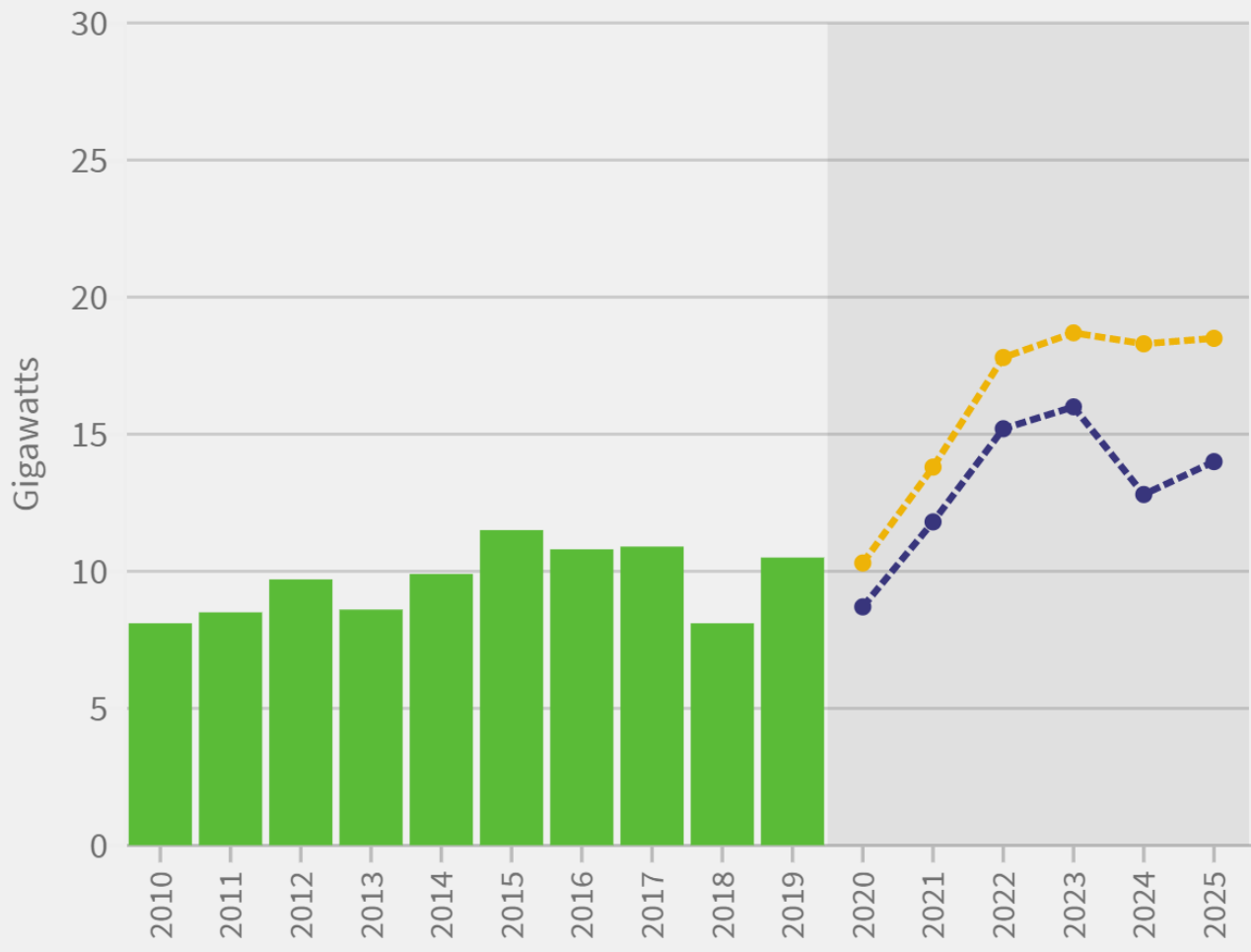
Wind and solar capacity additions may set new records in 2021

Annual capacity increase in European Union

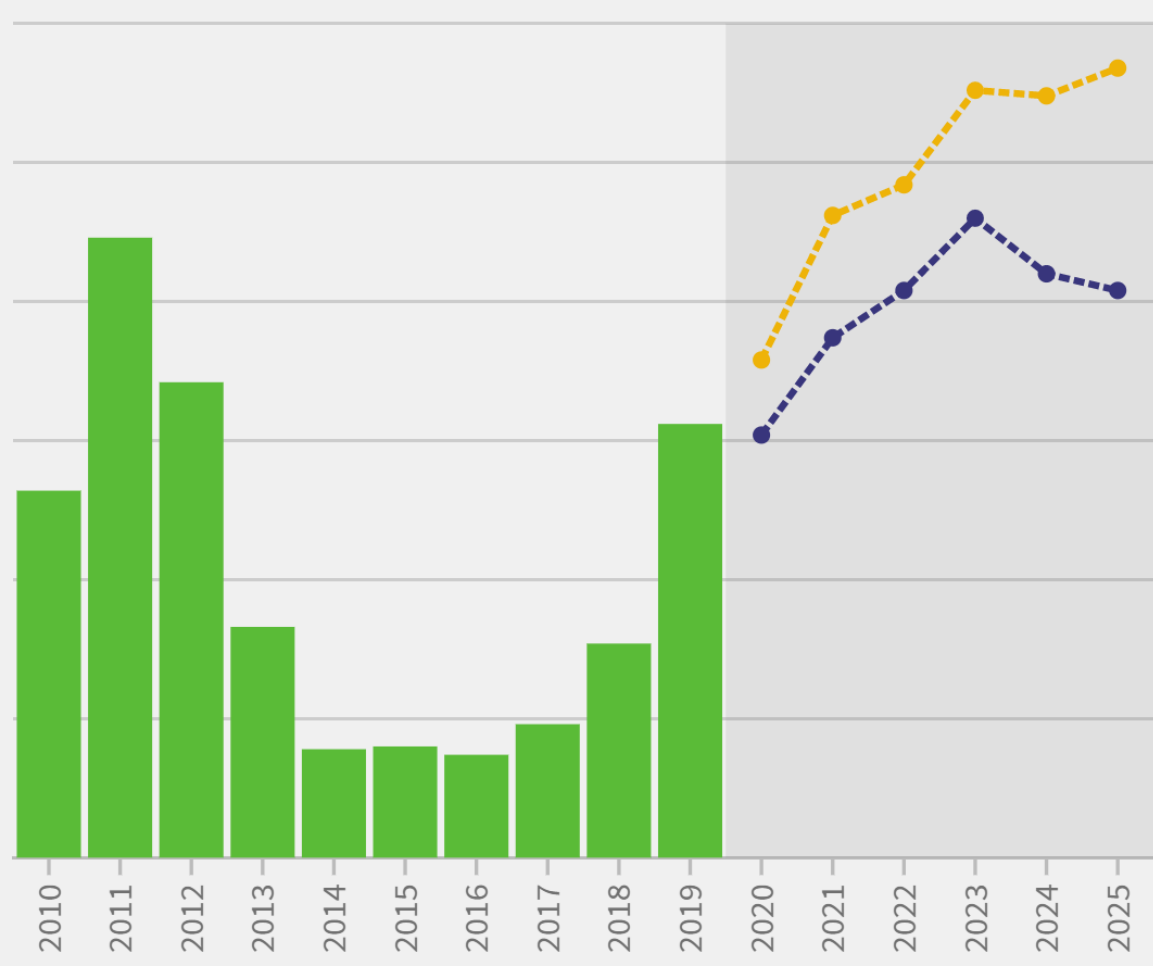


■ Main case ■ Accelerated case ■ Actual new additions

Wind



Solar

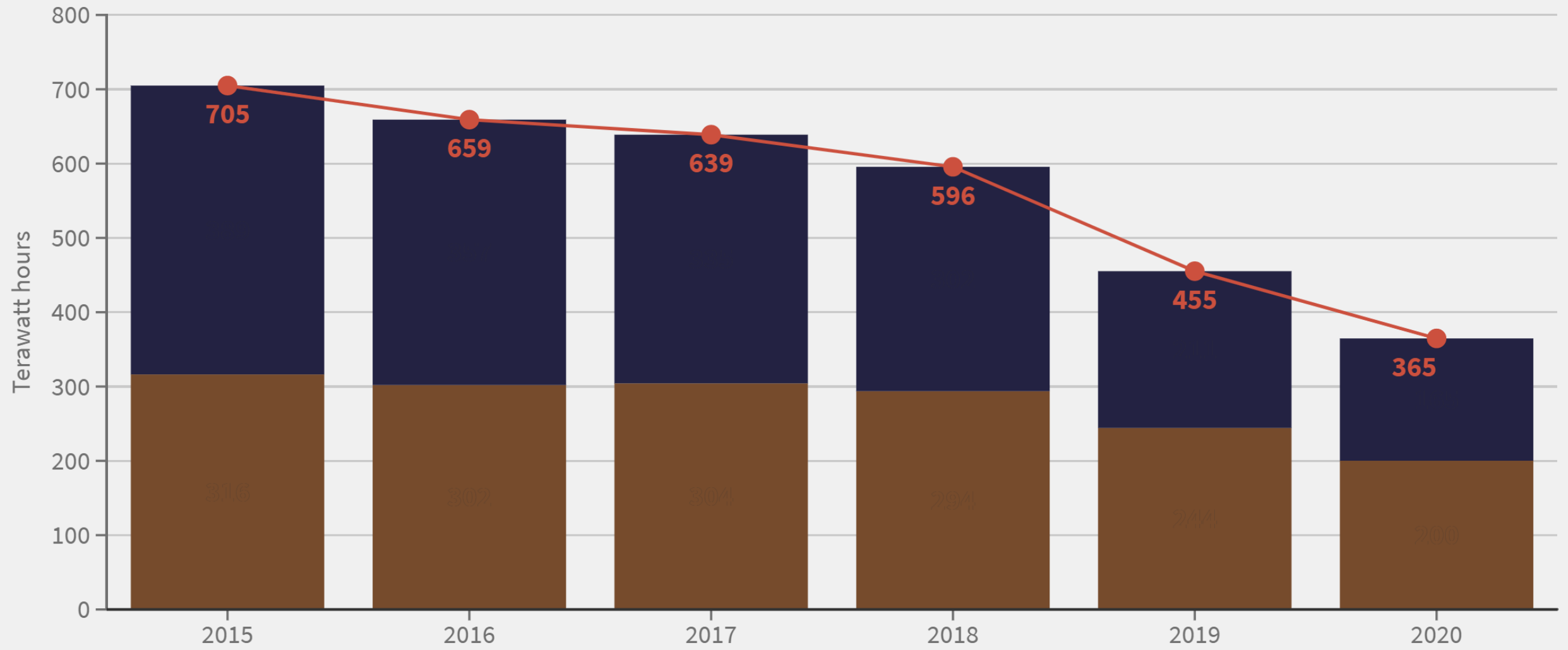


Source: International Energy Agency (IEA) Renewable Data Explorer, data published 20 November 2020

Coal has almost halved since 2015

EU-27 electricity generation

Total coal Lignite Hard coal



Europe's Power Sector in 2020, published by Ember and Agora Energiewende on 25th January 2021.

Coal continues to collapse across Europe

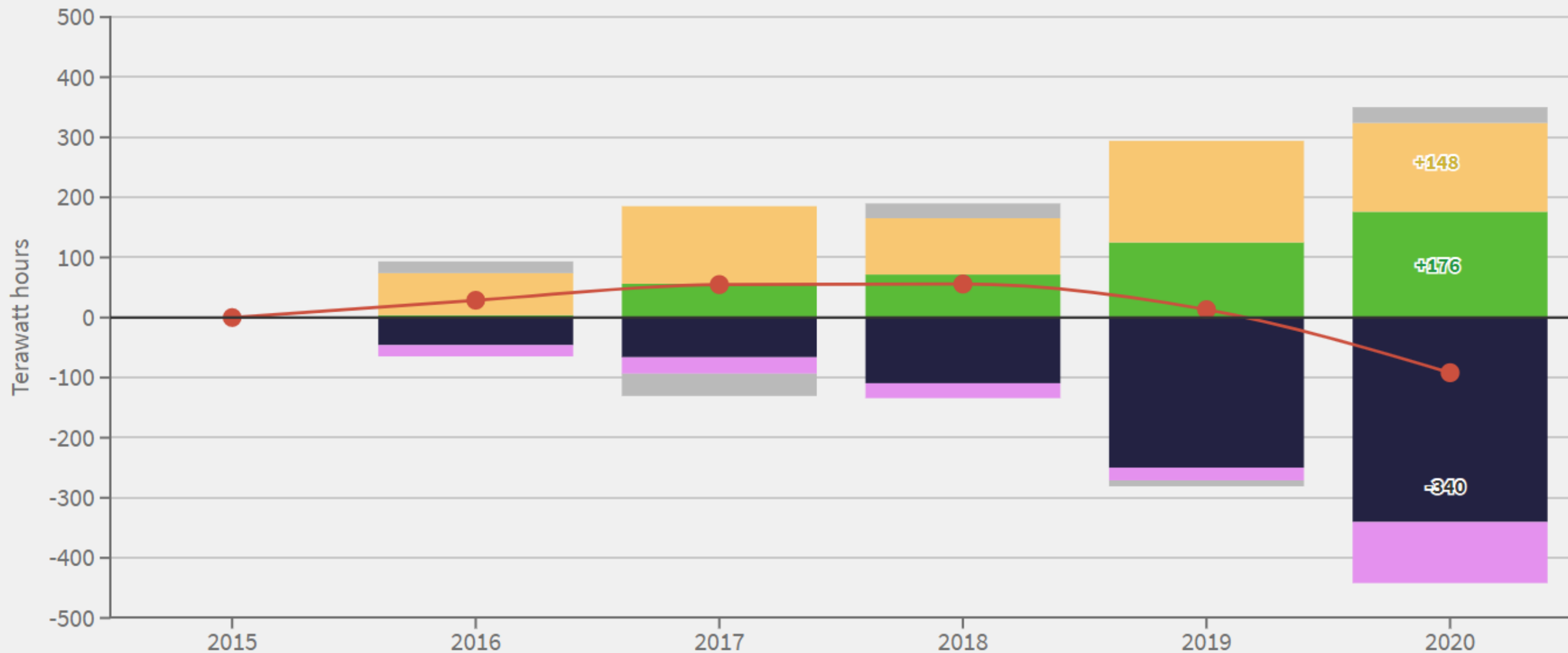
Hard coal and lignite generation (bars), percentage change from 2019 to 2020 (shaded)



Only half of coal's fall was due to rising wind and solar

Cumulative change since 2015 in electricity generation for EU-27

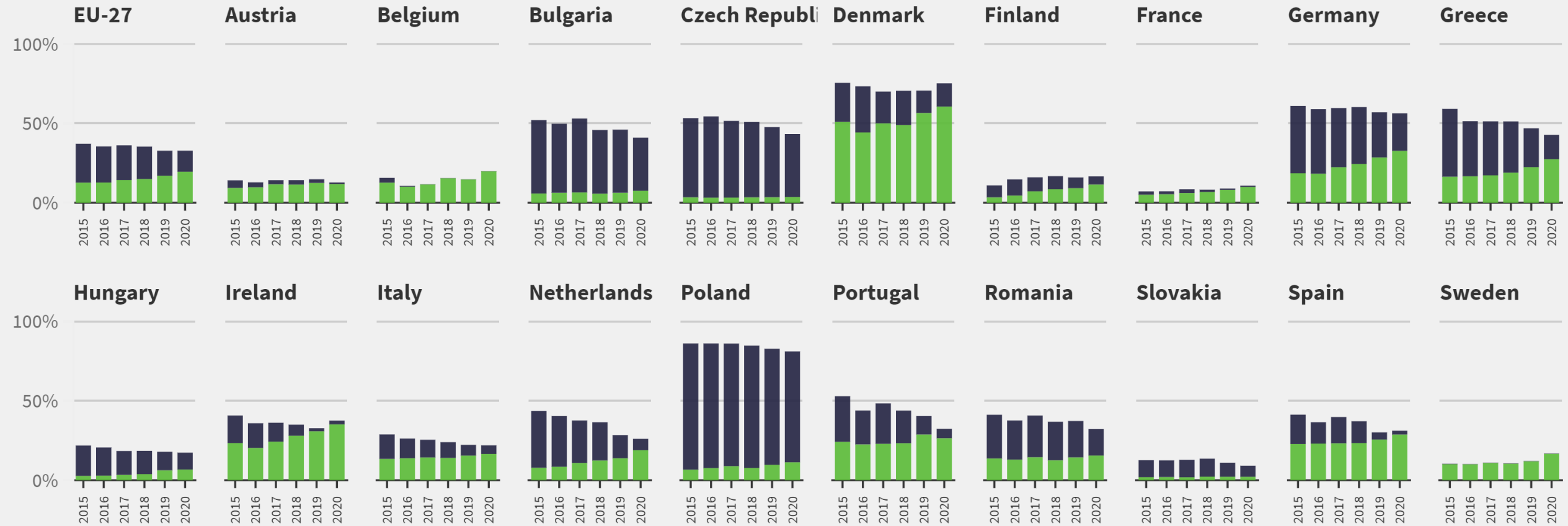
■ Demand ■ Coal ■ Wind and solar ■ Gas ■ Nuclear ■ Other generation



How far does wind and solar have to go to replace coal?

Percentage of total electricity generation

Wind and solar Coal

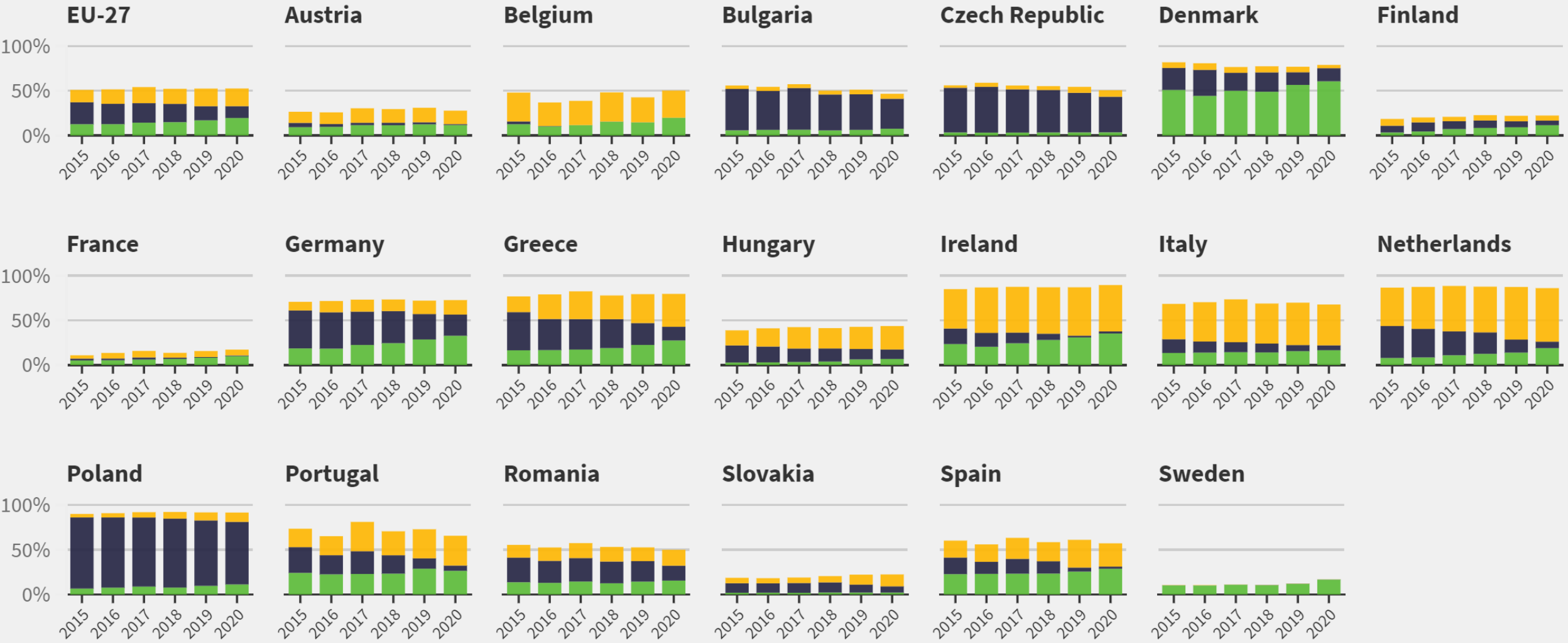


Europe's Power Sector in 2020, published by Ember and Agora Energiewende on 25th January 2021.

How far does wind and solar have to go to replace coal and gas?

Percentage of total electricity generation

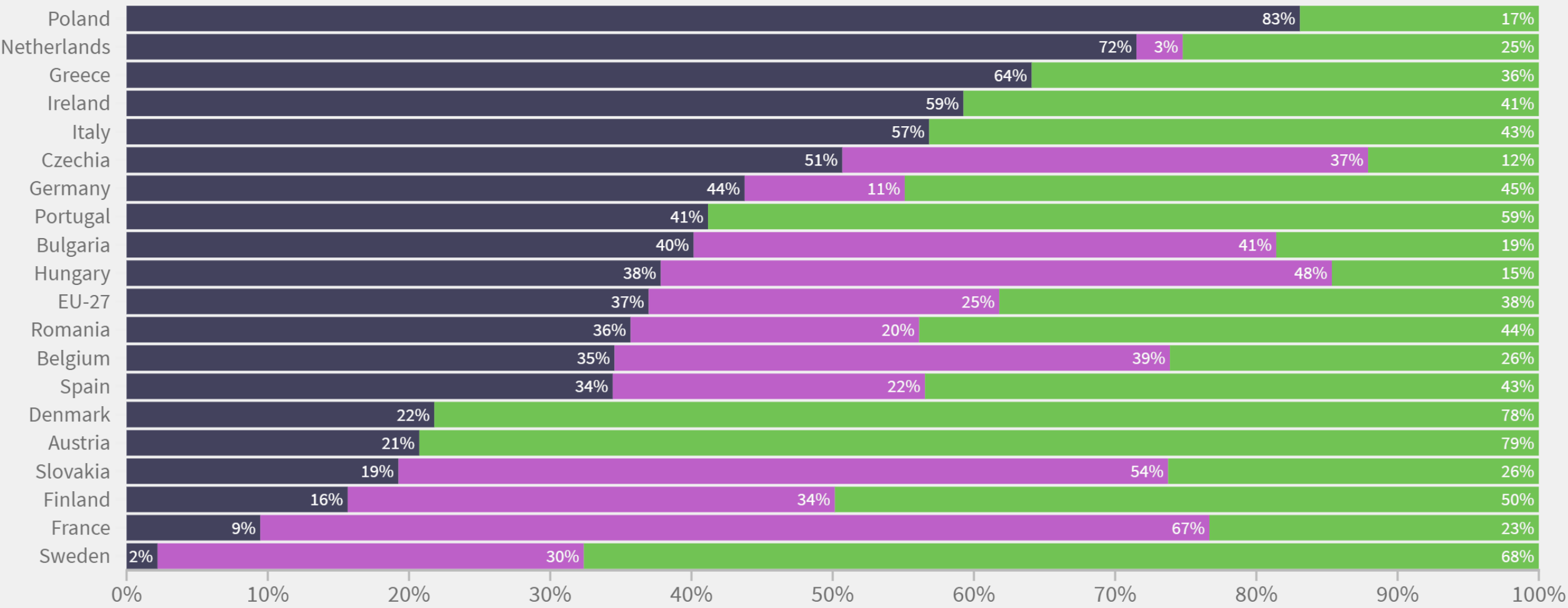
Wind and solar Coal Gas



Fossil fuels vs. Renewables

Share of electricity generation

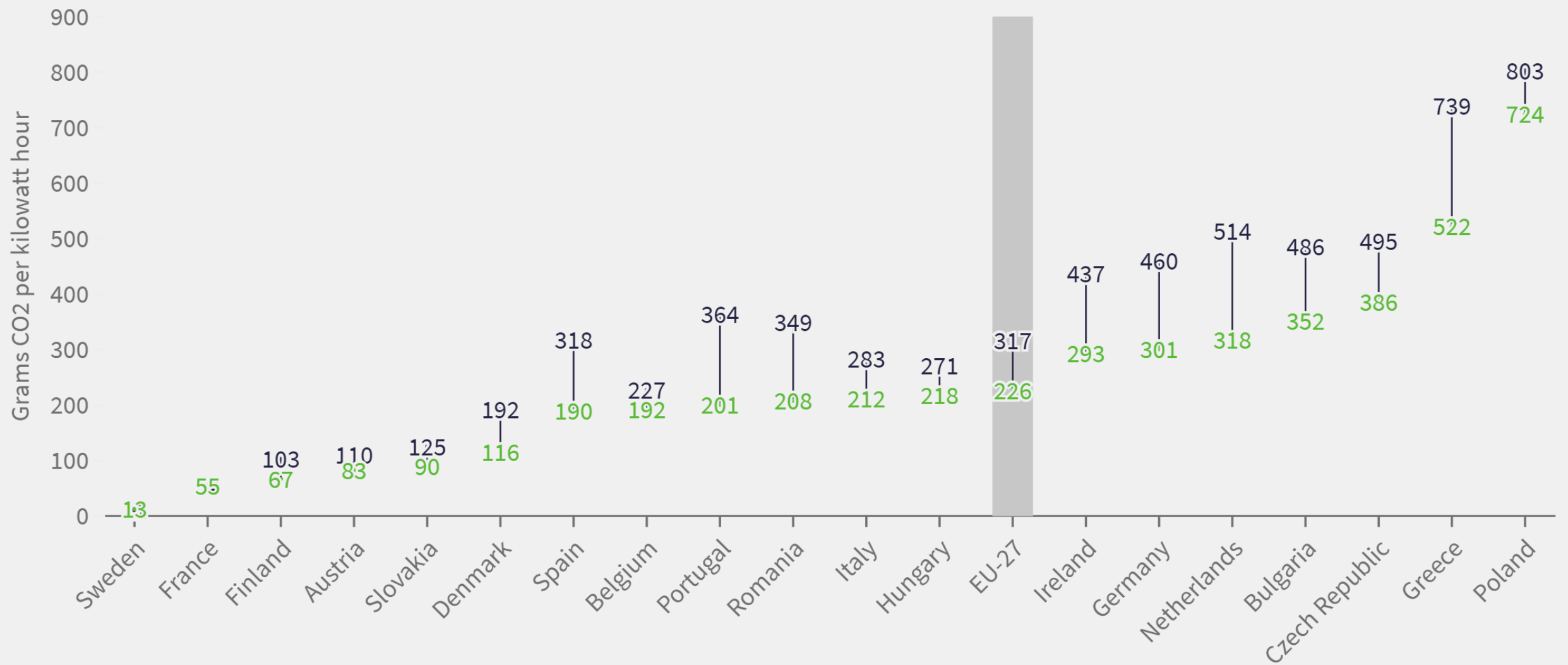
Fossil Nuclear Renewables



Europe's Power Sector in 2020, published by Ember and Agora Energiewende on 25th January 2021. The 19 countries displayed account for > 97% of EU-27 electricity consumption.

Race to zero

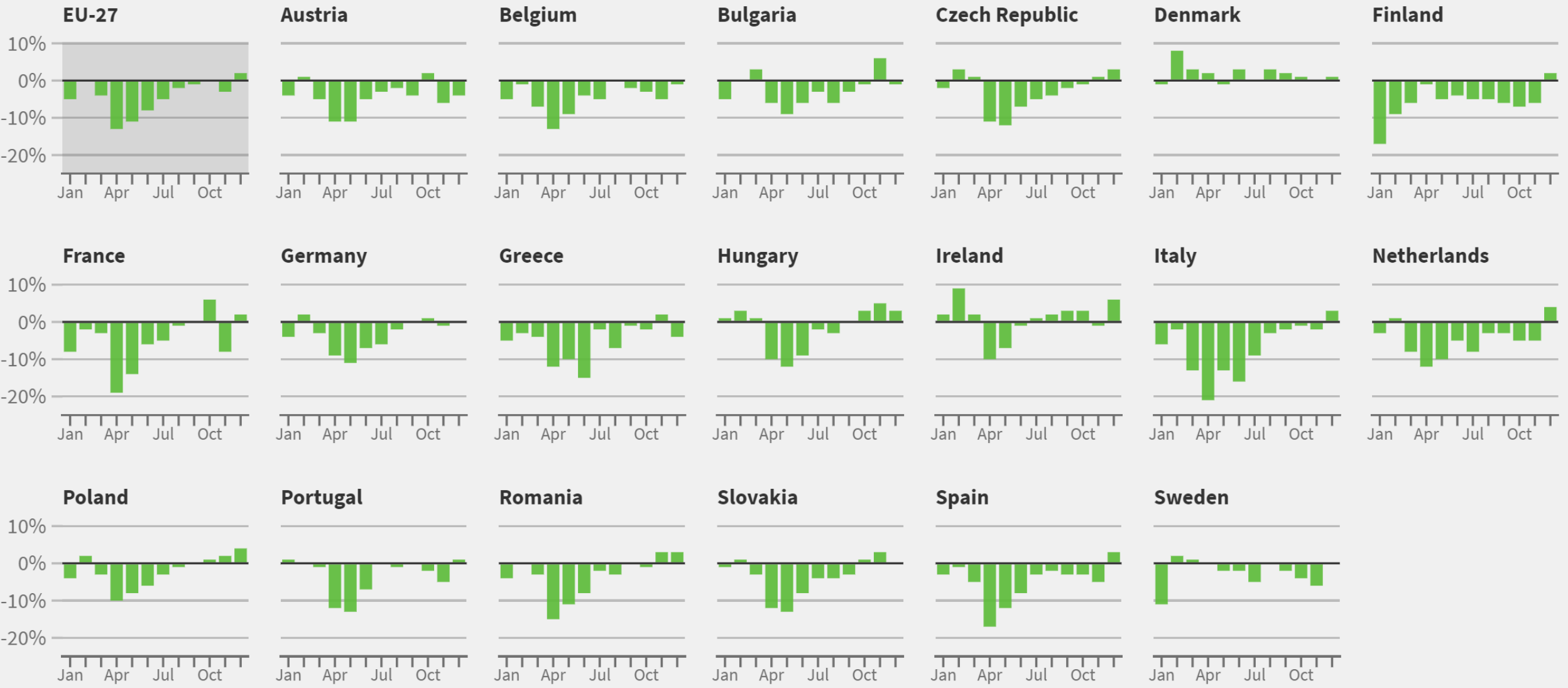
Power sector carbon intensity in **2015** and **2020**



Source: European Environment Agency for 2015; Ember calculation for 2020. Excludes CO2 and methane emissions from upstream gas and coal production. • The 19 countries displayed account for > 97% of EU-27 electricity consumption.

Impact of Covid-19 on electricity demand was short-lived

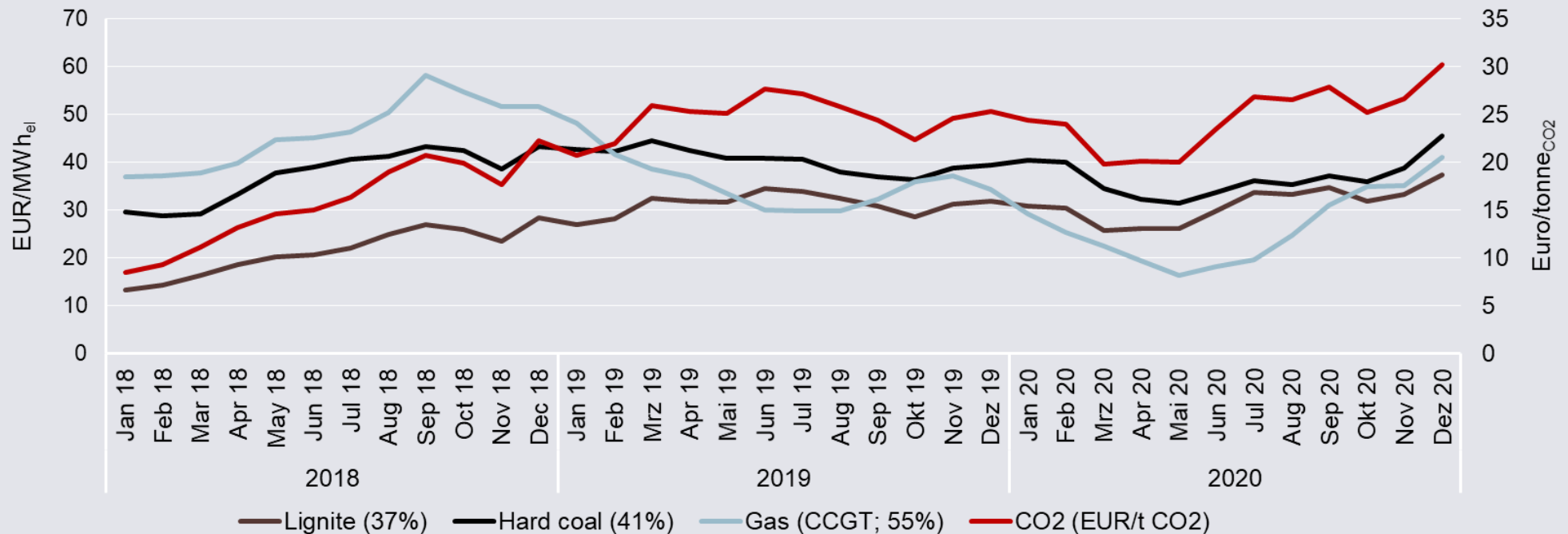
Monthly electricity demand change in 2020 versus 2019



Source: Ember analysis of Entso-E total load data

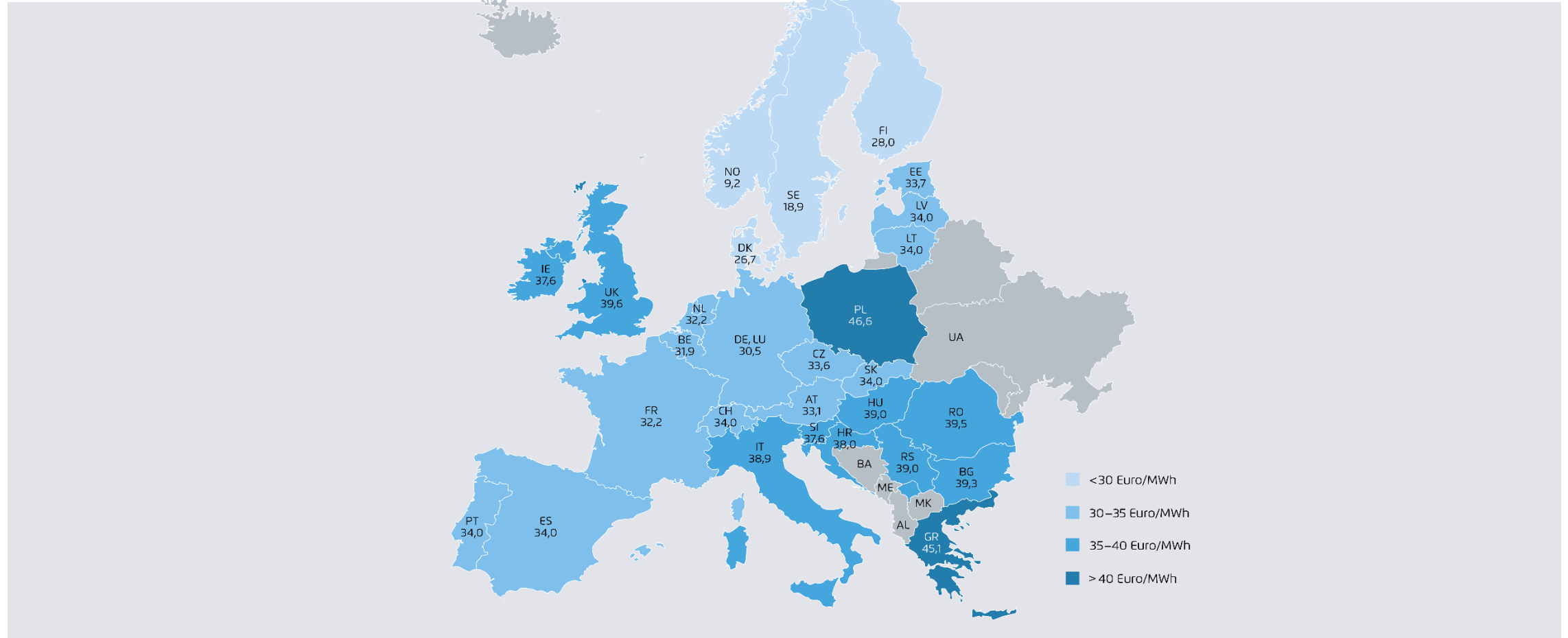
Stable CO₂-price and low gas prices led to coal-gas switch. In 2020, gas power plants were cheaper than lignite power plants for large part of the year.

Coal and gas plant running costs (average day-ahead price)



Ember/Agora Energiewende (2021), World Bank 2021; UBA 2015; DEhSt 2021

**Decreased demand led to low electricity prices across Europe.
Clear tendency of higher prices in states with high share of coal and low share of renewables.**



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**Thank you for
your attention!**

Questions or Comments? Feel free to contact us:

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