

# Power Systems of the Future

Pierre Tardieu

# Our members make wind energy work

400+ MEMBERS

Wind turbine manufacturers

e.g.



GE Renewable Energy

SIEMENS Gamesa  
RENEWABLE ENERGY

Vestas

Wind farm developers

e.g.



VATTENFALL

Power utilities

e.g.



Component manufacturers

e.g.



Installation / logistics

e.g.



Financial & legal services

e.g.



Research institutes

e.g.



+ NATIONAL WIND ASSOCIATIONS

# Wind energy in Europe

189 GW

Of which:

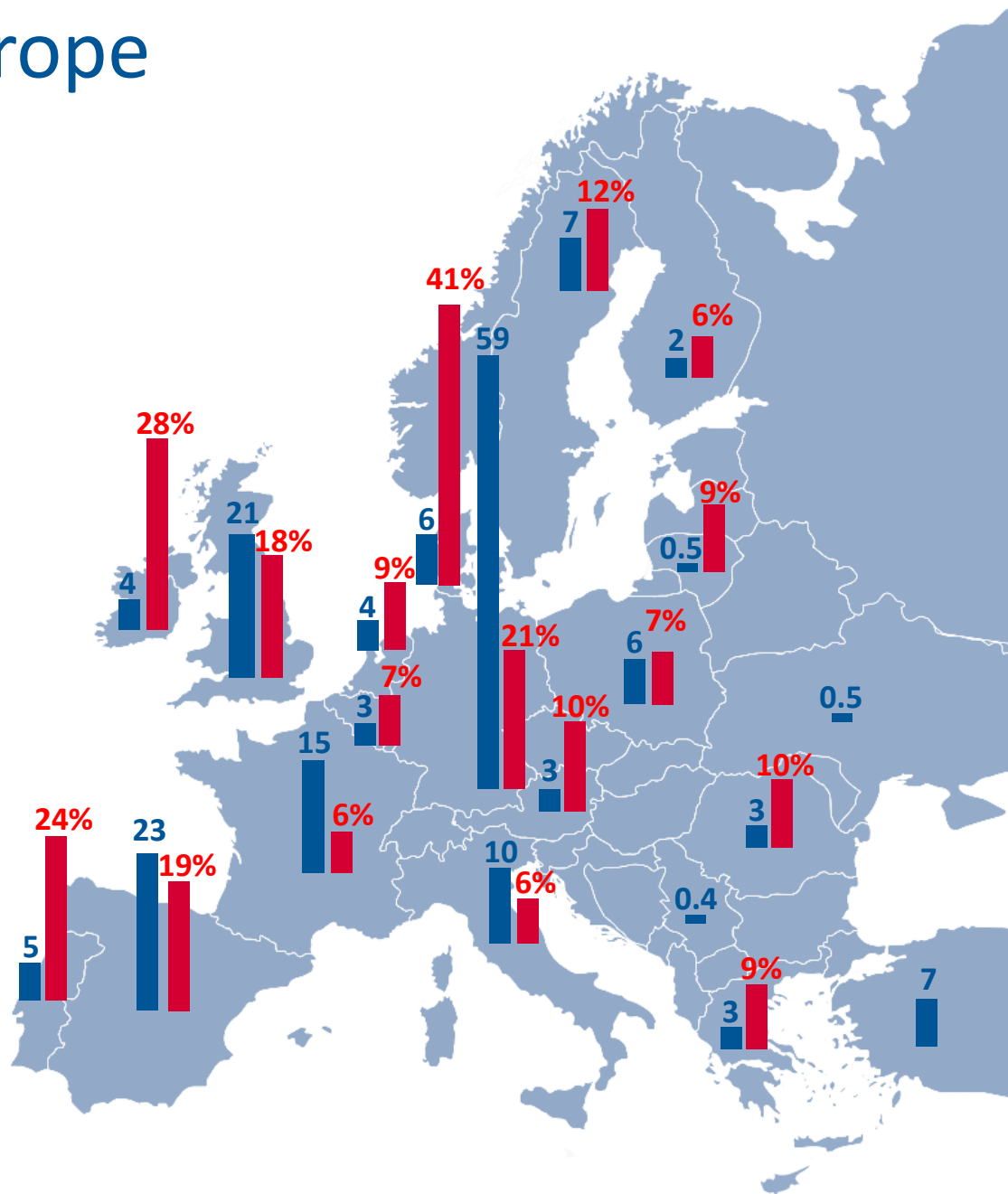
18.5 GW

offshore

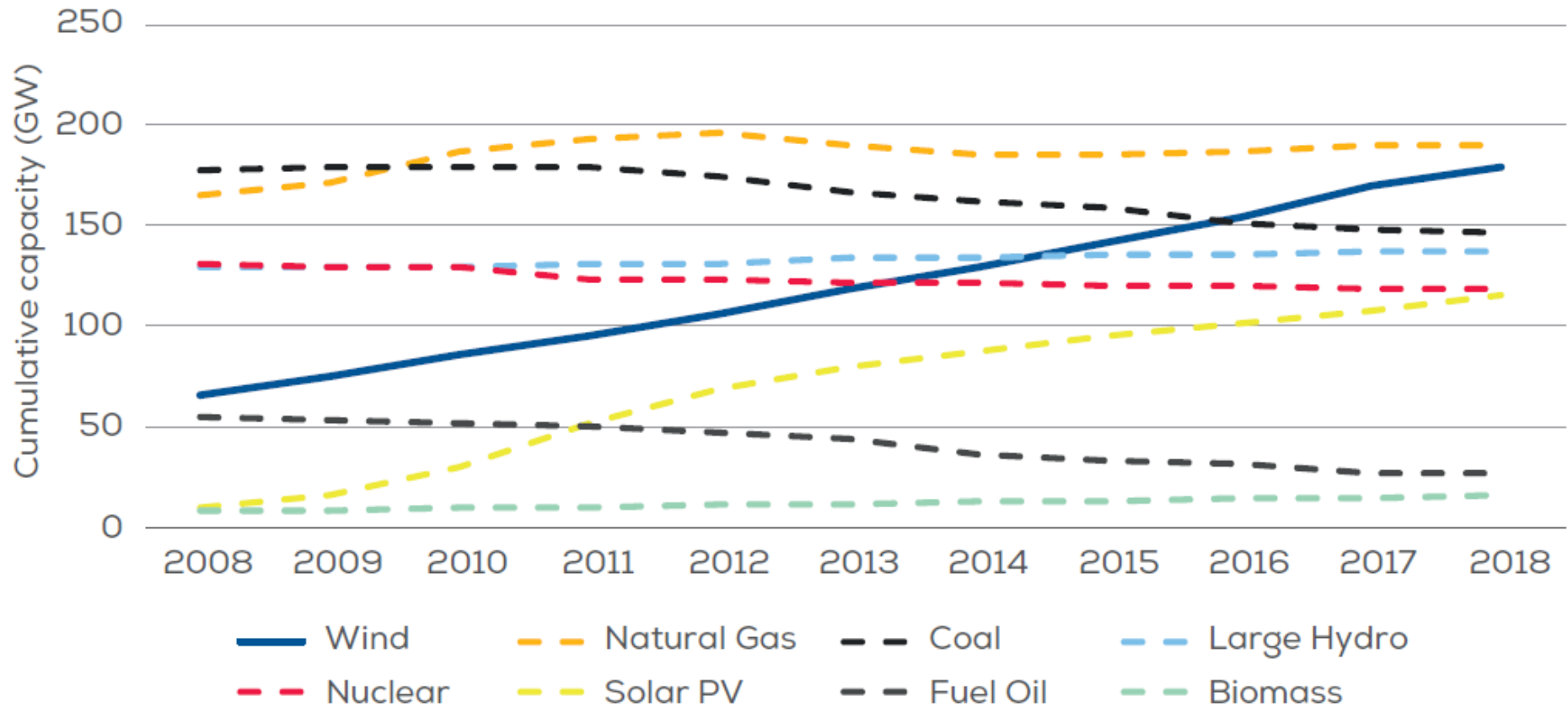
14%

of 2018 EU  
power demand

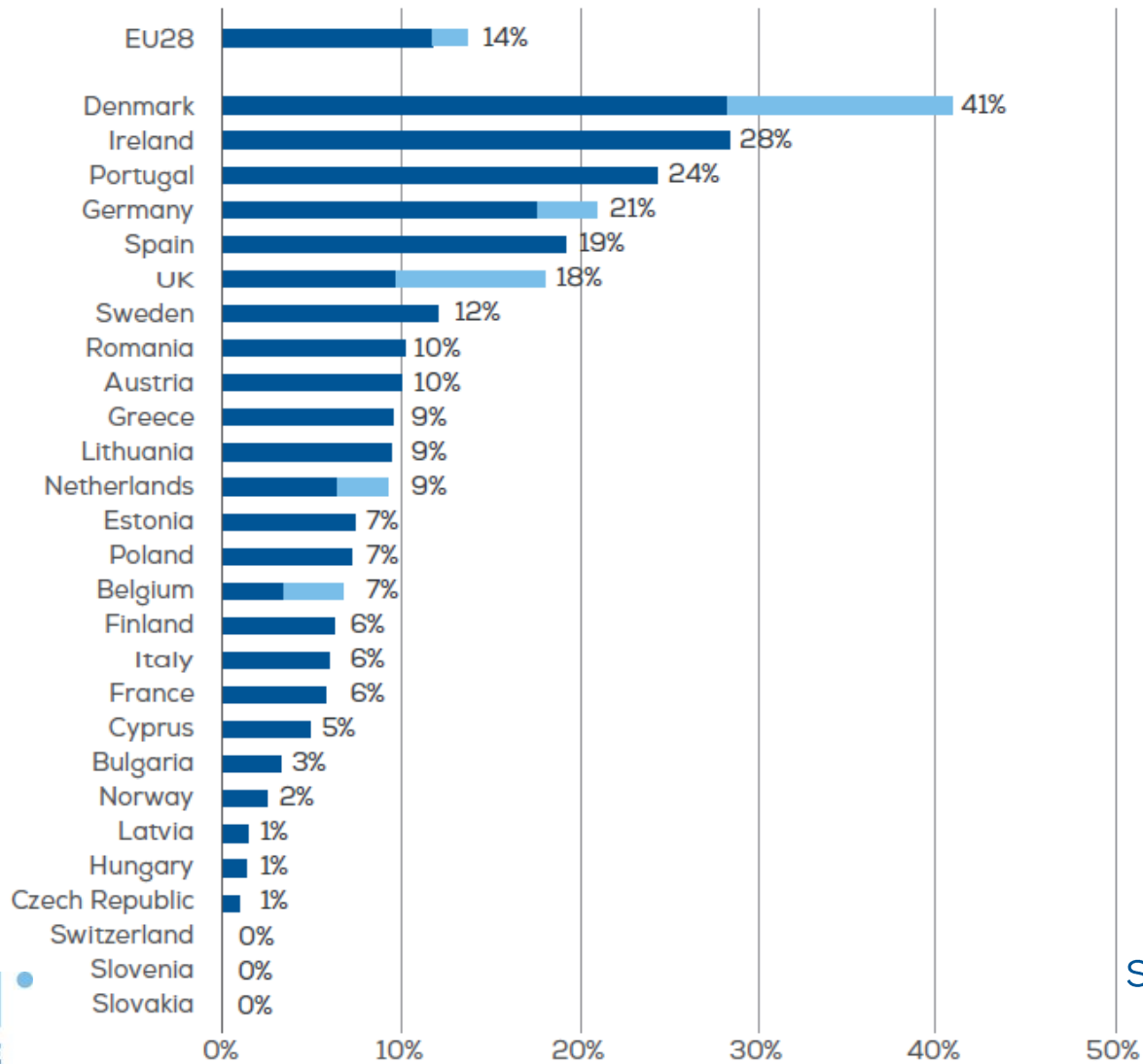
- GW installed
- Penetration



# Wind has the 2<sup>nd</sup> largest power capacity in the EU



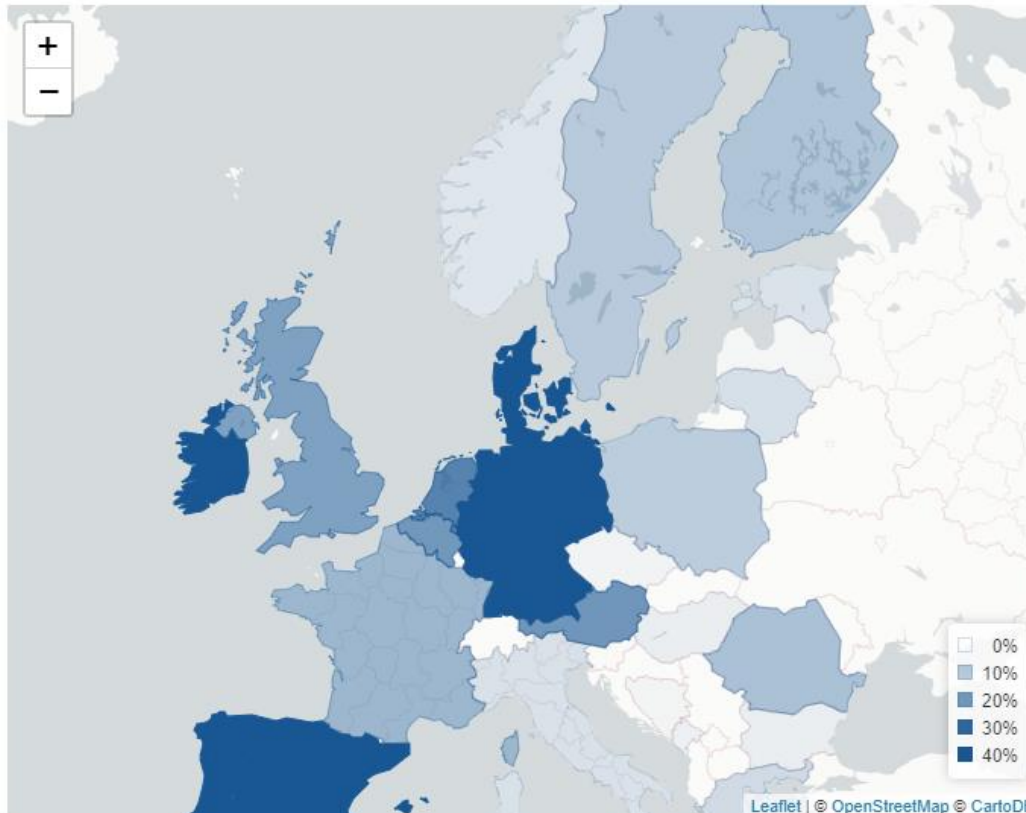
# Wind is now 14% of EU's electricity demand



# How much wind was in Europe's electricity yesterday?



-   
DAILY WIND ENERGY
-   
YESTERDAY'S TOP 20 COUNTRIES
-   
HOURLY ELECTRICITY MIX
-   
HOURLY WIND ENERGY GENERATION
-   
CAPACITY FACTORS



Share of wind energy in electricity demand

# 19.6%

 **16.9%**  
1,622 GWh onshore wind

 **2.7%**  
262 GWh offshore wind

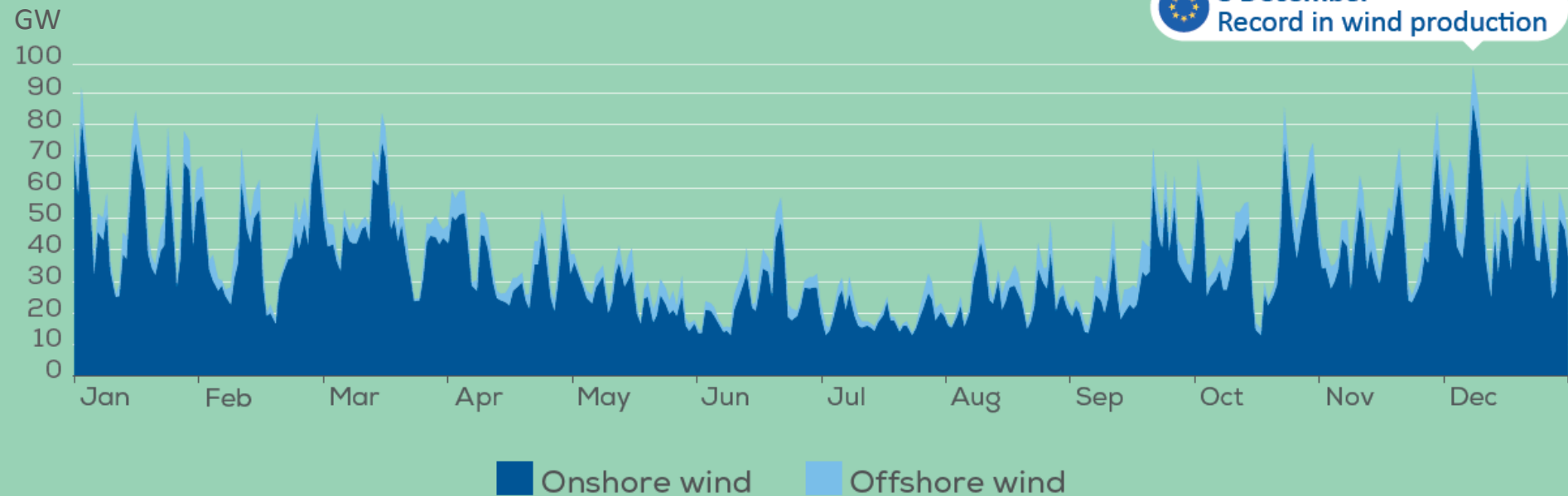
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[See the explanation](#)

# Providing baseload power

## European wind energy generation in 2018

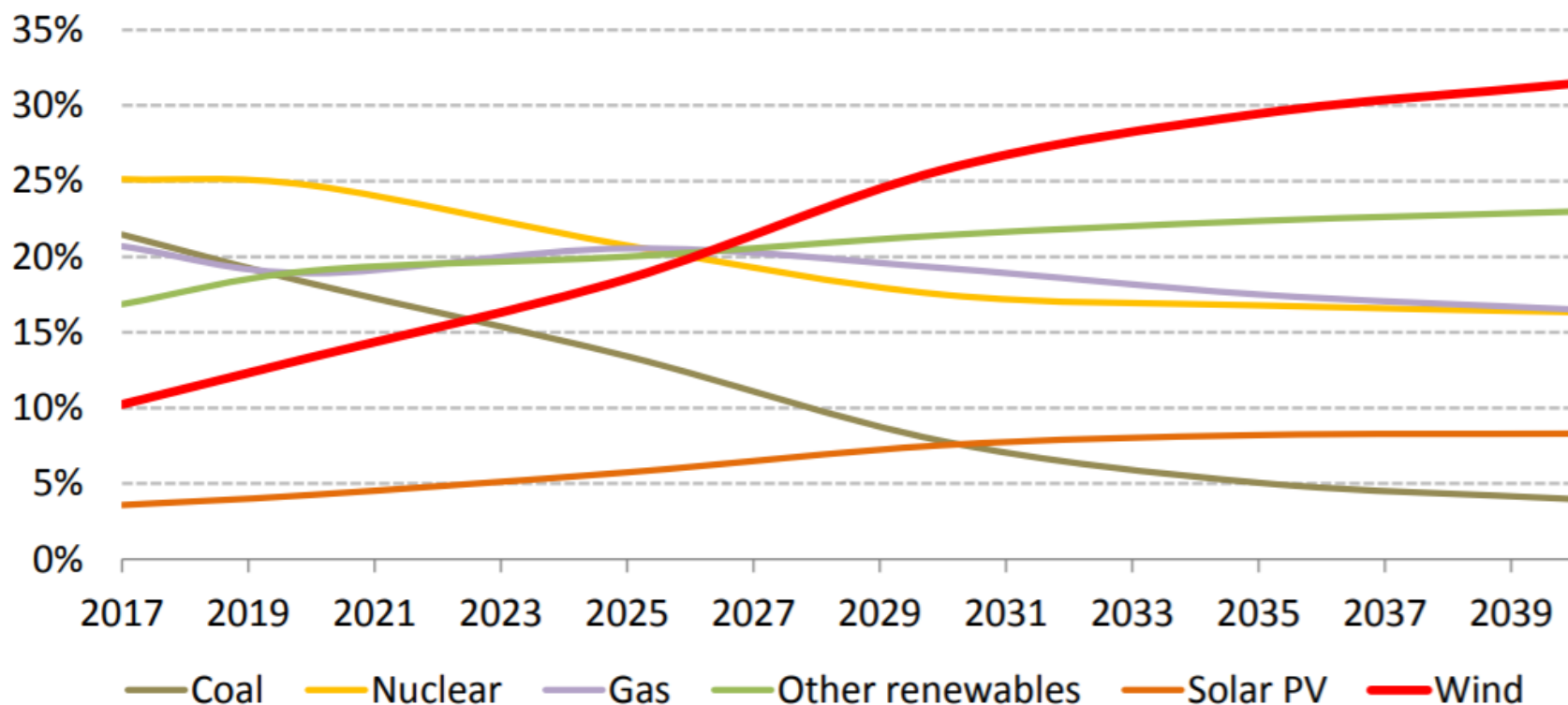


 **8 December**  
Record in wind production

Data refers to EU Member States only

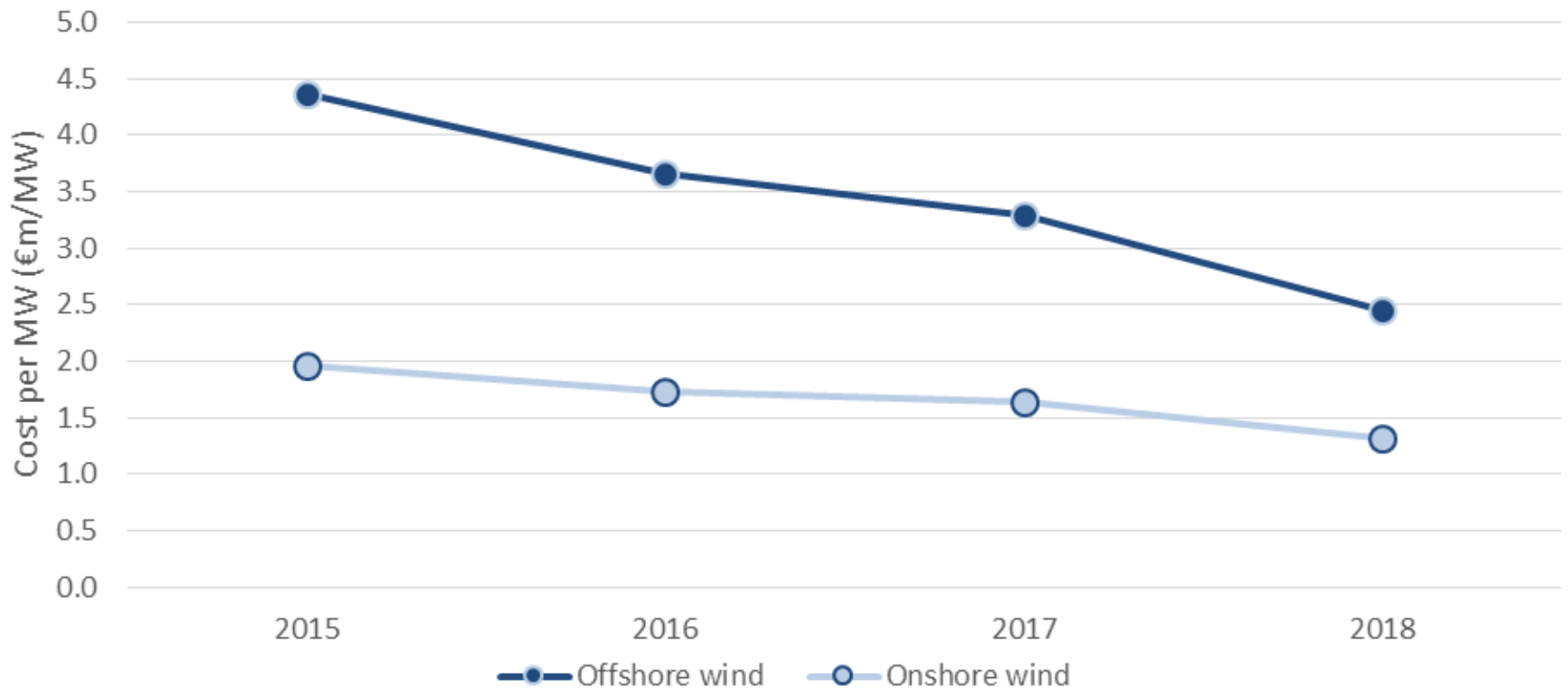
# Wind will become the largest power source in the EU by 2027

Share of electricity generation by source in the EU, 2017-40

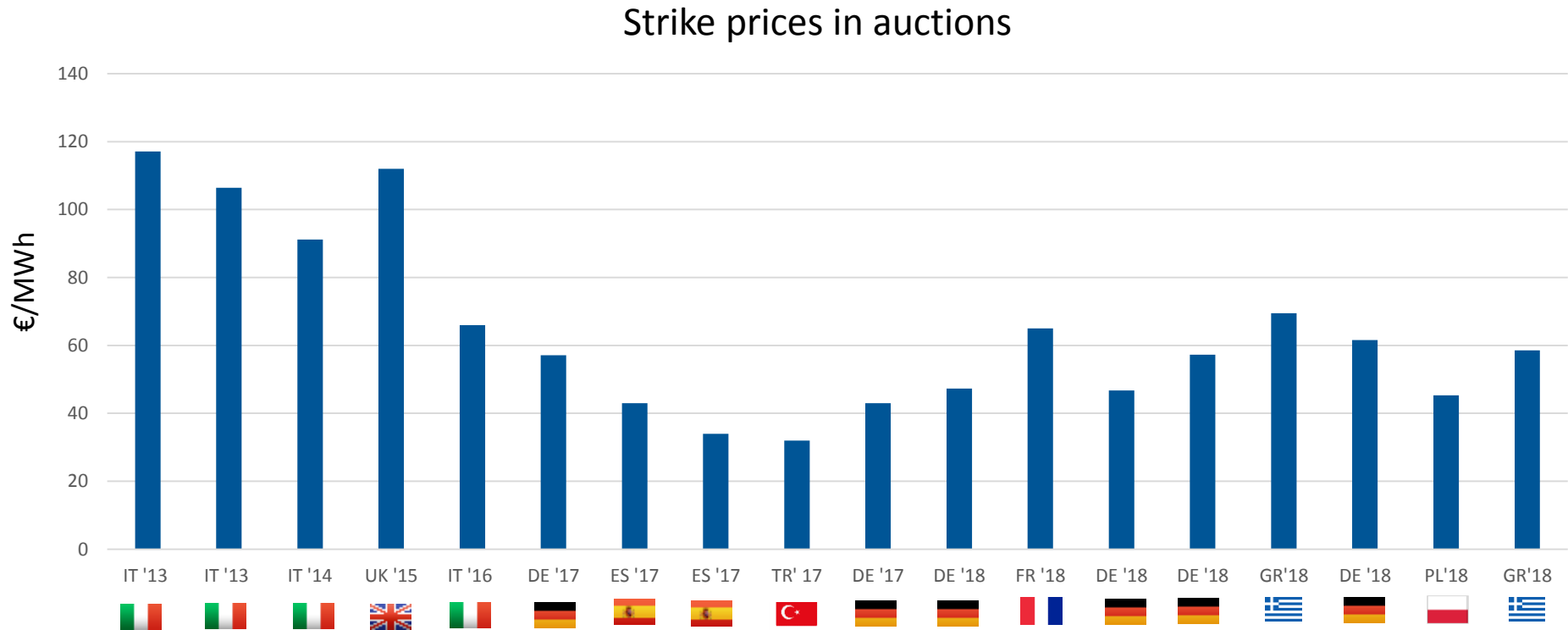




# CAPEX of new wind farms is steadily decreasing



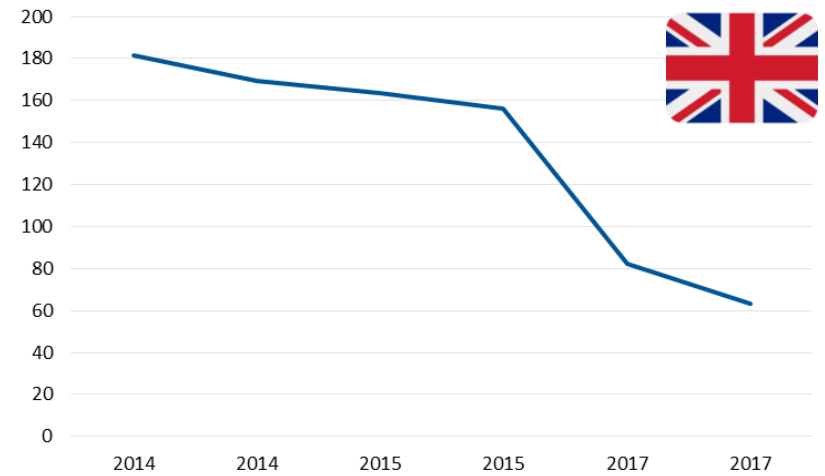
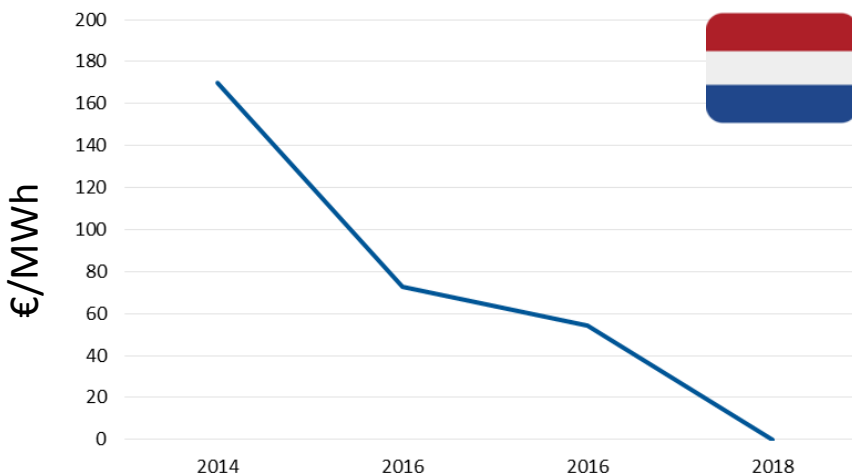
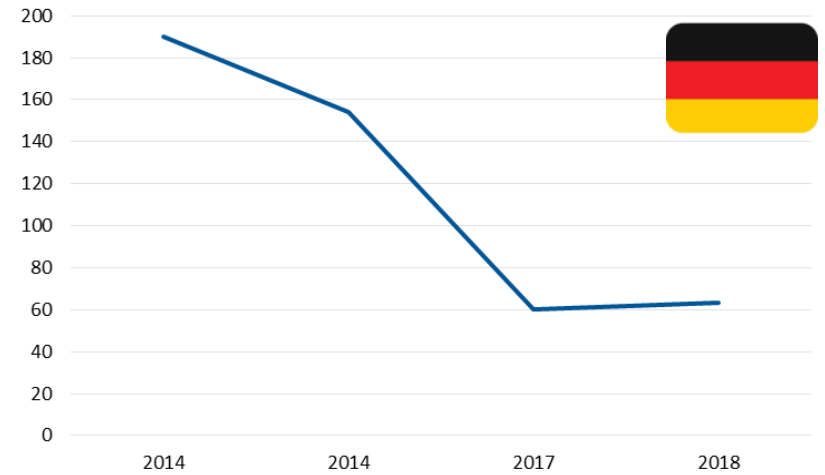
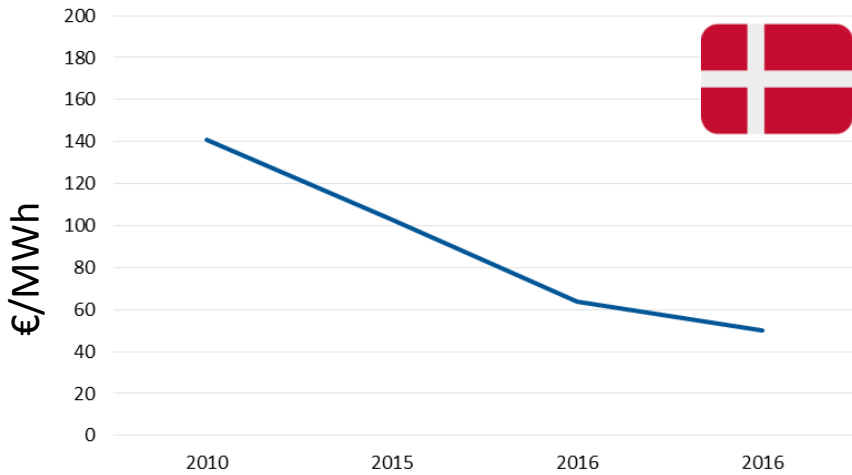
# The cost of onshore wind is decreasing



Source: WindEurope

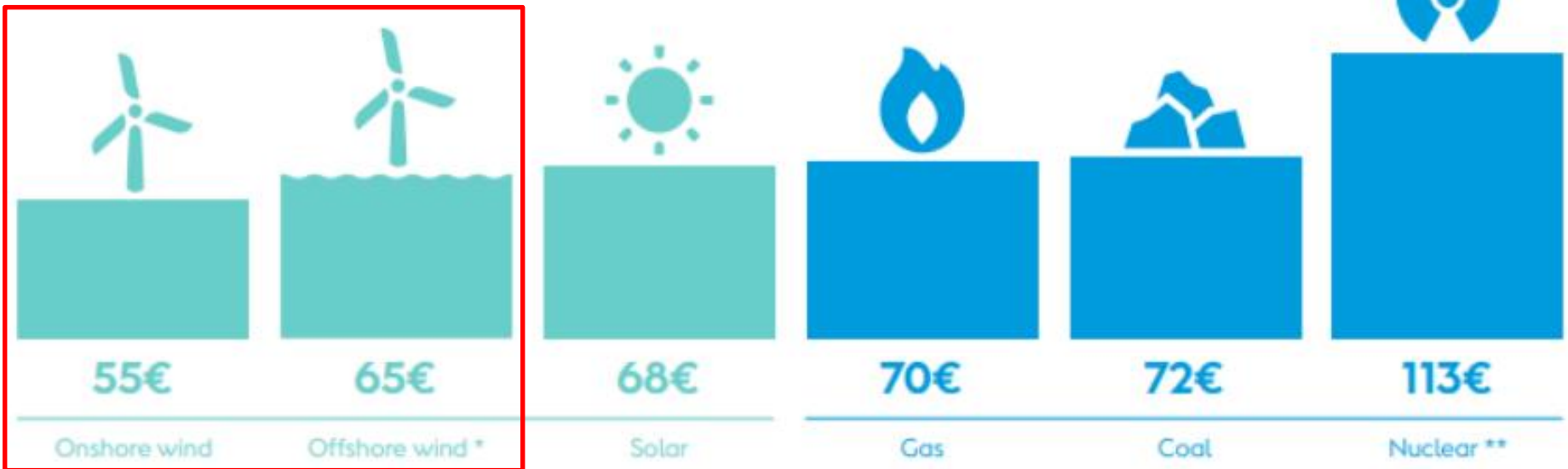
# The cost of offshore wind is also decreasing

## Strike prices in auctions



# Wind the cheapest form of new power generation

Levelised cost of electricity/MWh

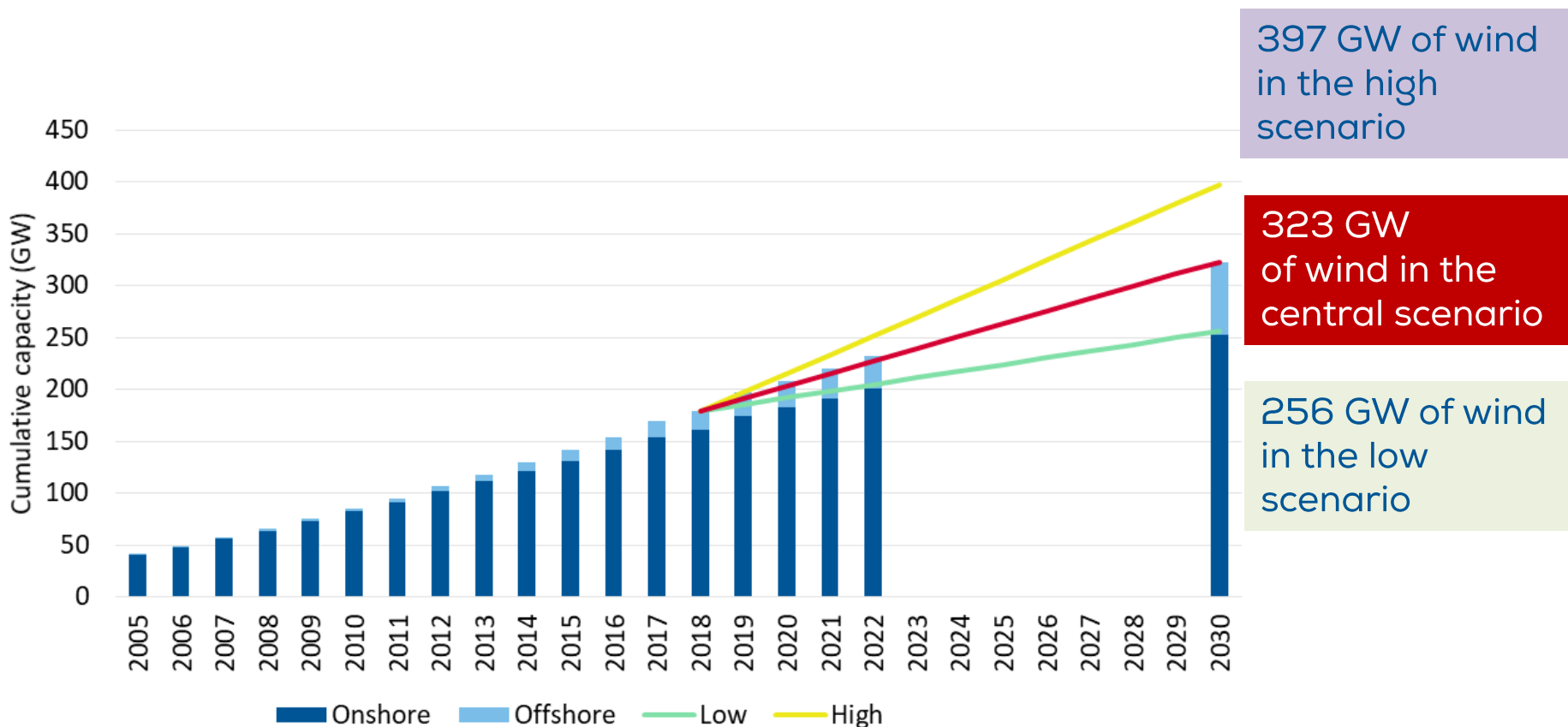


Source: Bloomberg New Finance (2016-prices), Year of FID.

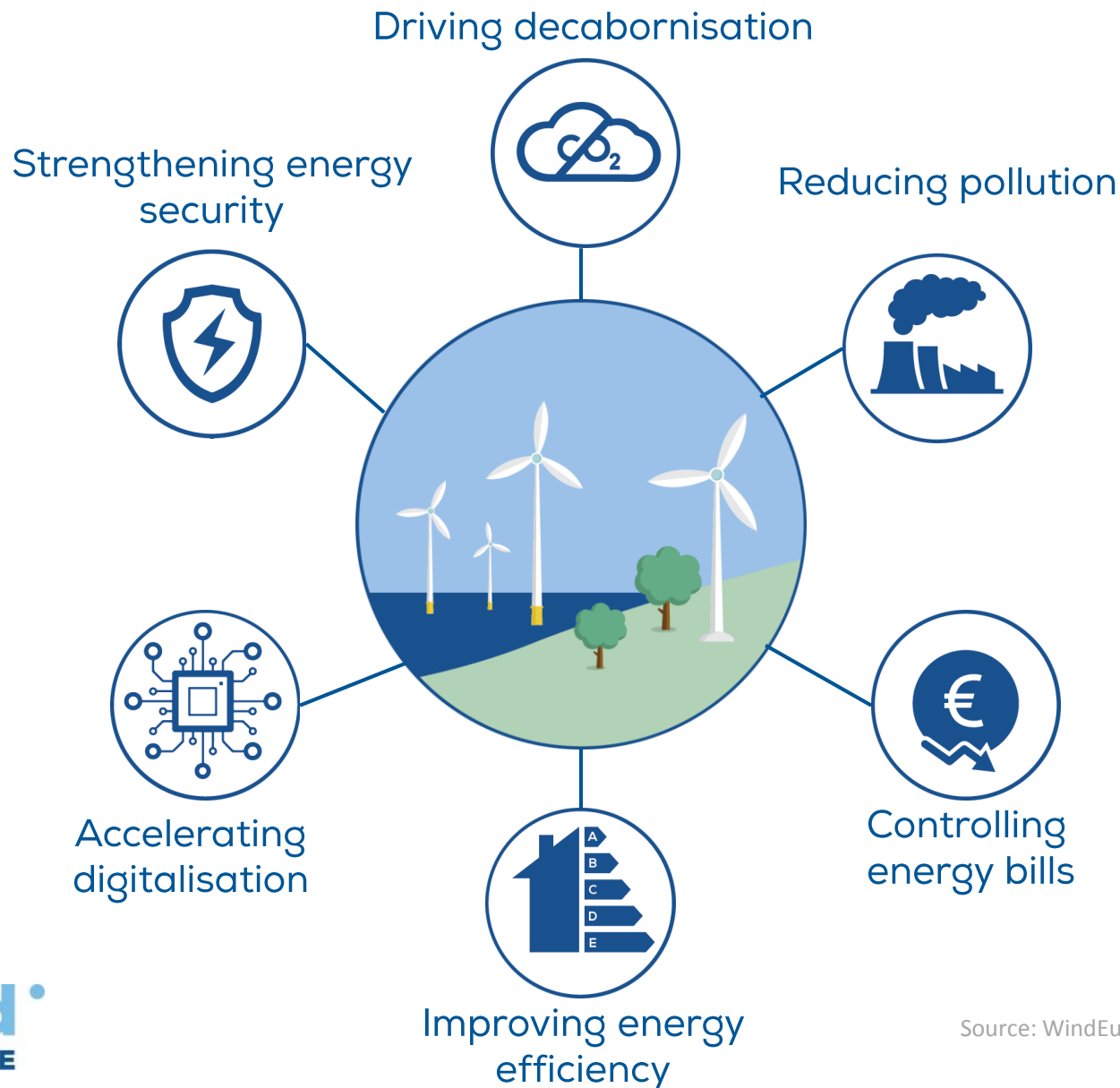
Prices reflect North Western European market conditions, which express a global trend. Specific prices may vary across regions.

\* Offshore: Hornsea 2, UK (cost including transmission) \*\* Nuclear: Hinkley Point, UK

# Outlook to 2030

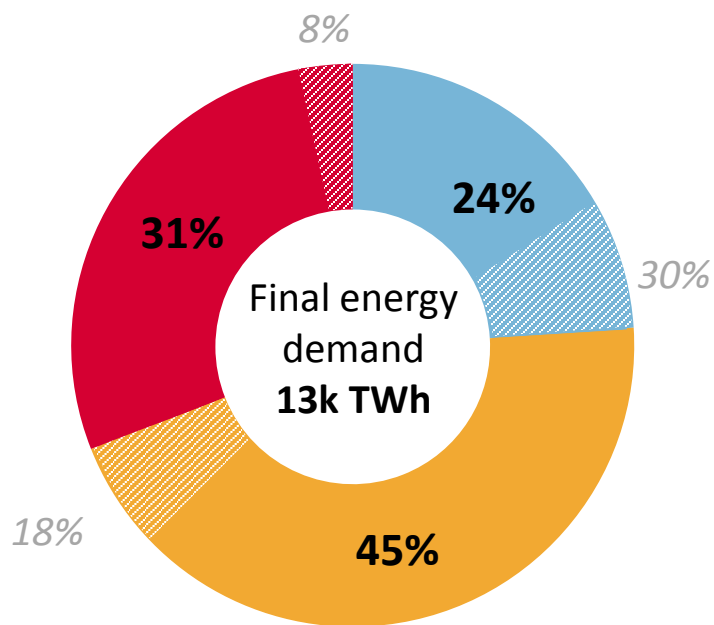


# Electrification benefits society

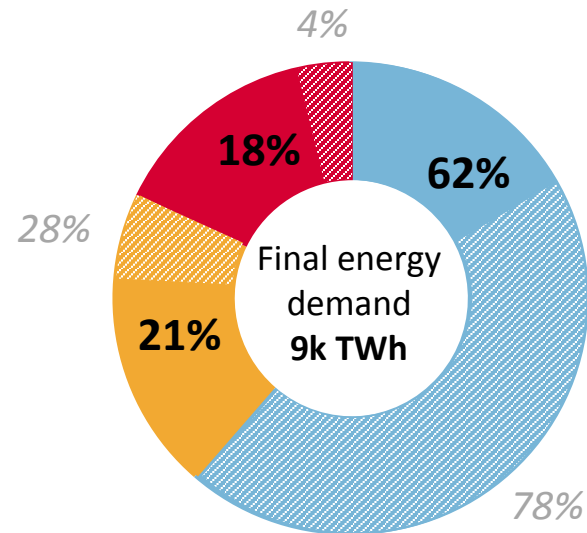


# Accelerate Renewables-based electrification

2018



2050

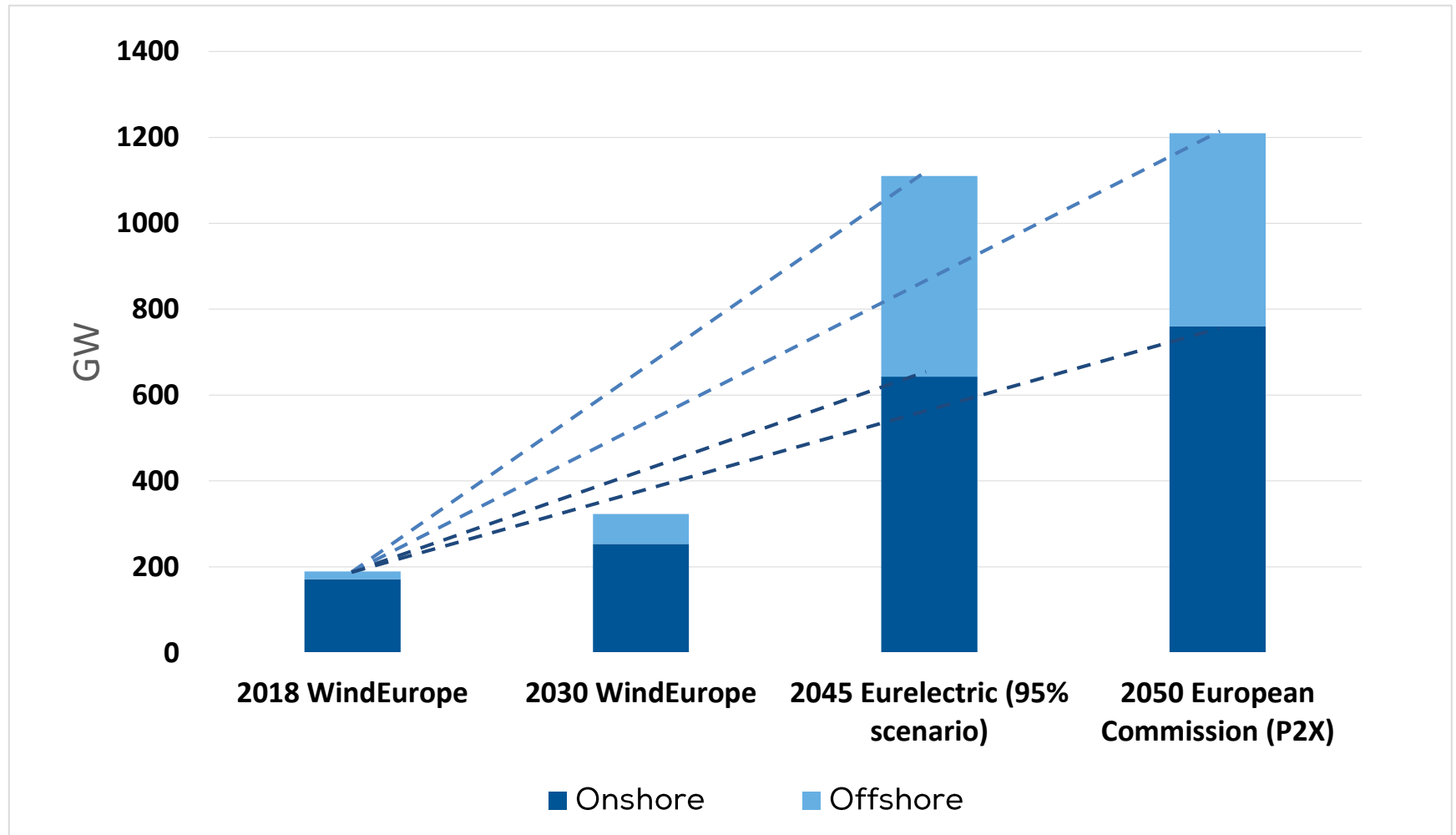


■ Power ■ Heat ■ Transport

▨ Share of renewables in the sector

# Wind capacity 2018 to 2050

50 GW pa between 2030 and 2050





# Have ambitious National Plans



# Engaging society



# THANK YOU

**Wind**<sup>•</sup>  
**EUROPE**

[windeurope.org](http://windeurope.org)



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