

# The Renewable Energy Industry and Drivers

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Any Questions?

Introduce RES

Overview of the Industry in the UK

Review the drivers for renewables

Challenges





**Sir Robert**  
**M<sup>c</sup>ALPINE**

Established  
150 years ago



Established  
37 years ago



The background of the slide is a photograph of a renewable energy landscape. In the foreground, there are rows of solar panels stretching towards the horizon. In the background, two large wind turbines stand against a sky with soft, orange and yellow clouds, suggesting a sunrise or sunset. The overall scene is hazy and atmospheric.

To create a future where  
everyone has access to  
affordable zero carbon energy



**16** GW

PROJECT  
PORTFOLIO

**37**

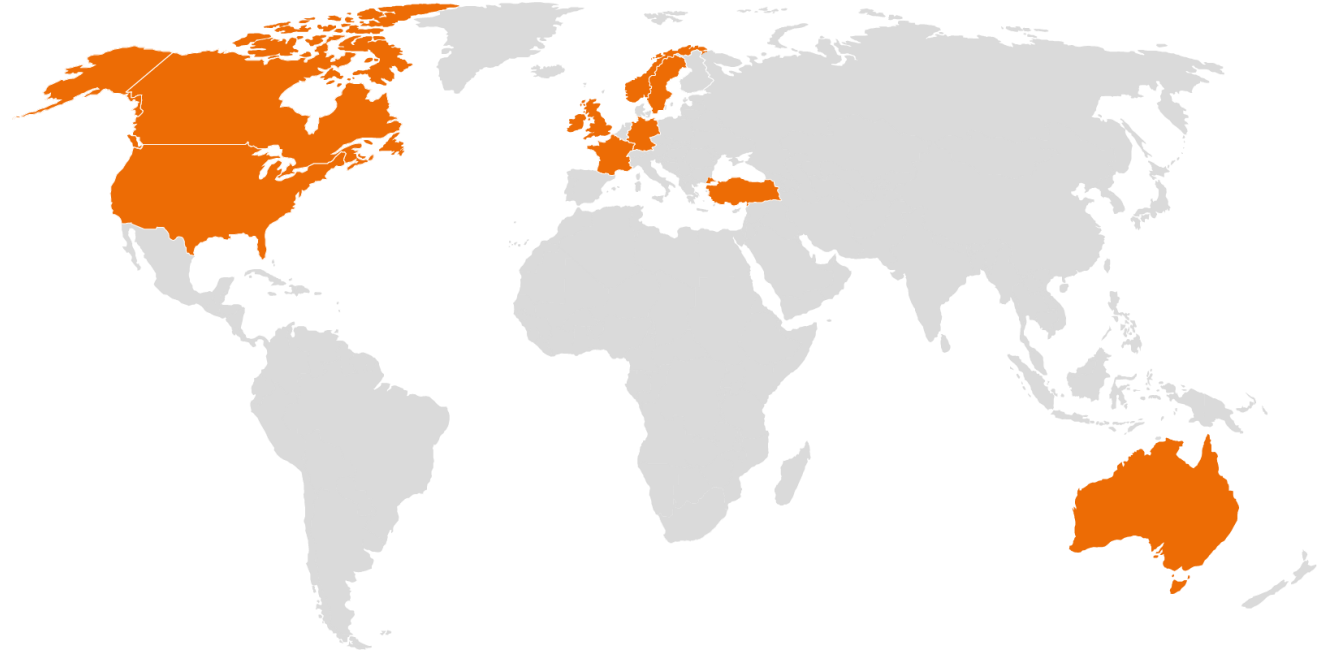
YEARS OF  
EXPERIENCE

**5** GW

OF OPERATIONAL  
ASSETS SUPPORTED

**2,000+**

EMPLOYEES



## ACTIVITIES



DEVELOP



CONSTRUCT



OPERATE

## TECHNOLOGIES



WIND



SOLAR



STORAGE



T&D





# Example Storage Project

**Location:**  
Near Broxburn, West Lothain, Scotland

**Power rating**  
20 MW

It will be Scotland's first battery energy storage system to provide a dynamic frequency service in sub-second timescales to the National Grid.





**1981**

A small team within Sir Robert McAlpine began innovative wind turbine engineering.

**2003**

RES moves to Beaufort Court, Kings Langley, Hertfordshire.



**2009**

RES provides engineering support for Centrica's offshore wind farm in the North Sea, Lynn and Inner Dowsing (194MW).

**1GW**

**8GW**

**2016**

RES delivers wind projects in the UK

**13GW**

**2018**

RES reaches financial close on Stage 1 of Murra Warra Wind Farm in Australia. When constructed it will be one of the largest wind farms in the Southern Hemisphere.

**1992**

The UK's second utility scale wind farm, Carland Cross in Cornwall, becomes operational. Now there are more than 1,000 wind farms in the UK.



**2001**

RES constructs the World's largest wind farm. The King Mountain wind farm was 278 MW. It remained the World's largest for over 5 years.



**5GW**

**2014**

RES' first energy storage project becomes operational in Ohio, USA.



**2015**

RES acquires System 3, a large US transmission company.



**2017**

RES signs Power Purchase Agreements with corporations including General Motors, General Mills, Telstra, Puget Sound Energy.

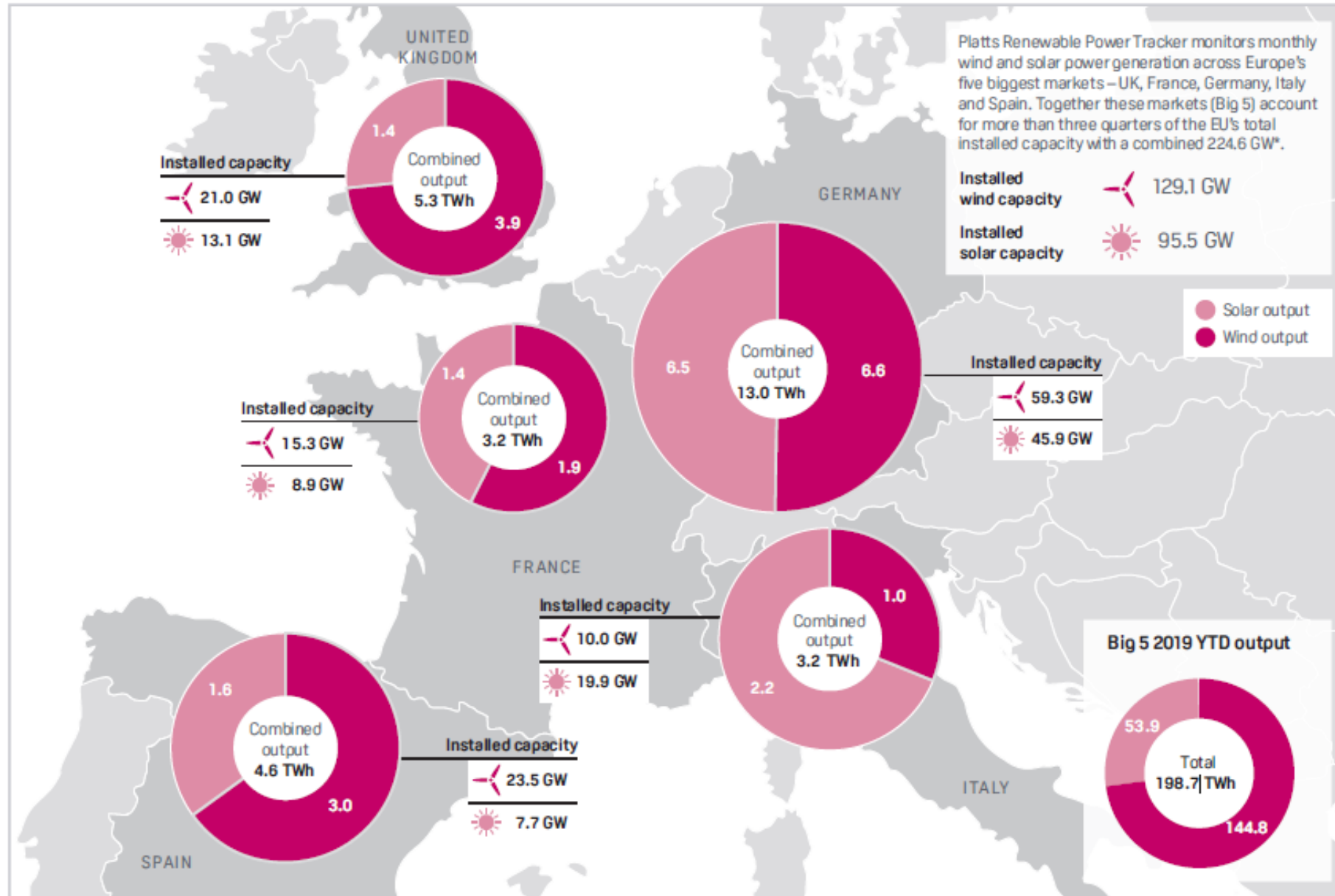




# Current state of the industry



## WIND, SOLAR OUTPUT IN EUROPE'S BIG 5, JUNE 2019



- Subsidy removal and emergence of Contracts for Difference auctions
- Renewables is the cheapest form of generation/ retiring thermal-based generation
- Technological Innovation – Floating offshore, kites, all types of energy storage
- Continuing cost reduction
- Subsidy-free projects are a reality and being
- Investors

The electric power industry has changed enormously over the last ten years. Ten trends shaped this transition:

- Decline of coal power
- Rapid growth of natural gas
- Grid parity of renewables (i.e., cost of alternative energy equal or less than traditional energy forms)
- Load defection (i.e., large companies and others bypassing their utility company to buy renewable energy directly from supplier)
- Utilities getting into solar energy
- Changing design of utility rates (e.g., what just happened in Spain)
- Modernization of electricity grid (to be able to meet needs of renewable energy)
- Utilities buying energy storage (e.g., batteries)
- Utilities becoming more customer centric
- Utilities changing their business models



- IPCC Report

In 2018, the Intergovernmental Panel on Climate Change (IPCC) warned that if humans do not limit global warming to 1.5 degrees Celsius by 2040, we will be unable to reverse the damage caused by climate change. 2019 has seen mass protests against climate change, from global school climate strikes to the Extinction Rebellion protests in London. Following these protests, on 1<sup>st</sup> May 2019, Parliament declared a 'climate change emergency', and on 12 June Prime Minister Theresa May pledged to end the UK's contribution to climate change by 2050.

This strong government action means that the UK is leading the way in legislating for zero-emissions among the G7. Already, low carbon technology and clean energy contribute £44.6 billion to the UK's economy each year, 400,000 people are employed in the low-carbon sector across the country and the renewable energy sector has grown by over 230% since 2009. In 2019, London created the world's first 24 hour Ultra Low Emission zone, reducing both emissions and pollution in the Capital. Supermarkets and retailers are under increasing pressure to reduce the prevalence of single-use plastics, and local authorities and housing associations are increasingly expected to commit to a low-carbon, low-emissions agenda.

- Expected rise in demand – decarbonisation of heating and transportation
- Carbon net-zero by 2050

“UK electricity demand almost doubles to 2050 under a net zero emissions scenario, necessitating the use of carbon capture in hydrogen production, power generation and industry, UK system operator National Grid said July 11. Achieving net zero greenhouse gas emissions by 2050 implies a 140% increase in UK generation capacity, from 108 GW in 2018 to 264 GW in 2050, with nearly 50 GW of natural gas-fired capacity fitted with carbon capture, usage and storage equipment, National Grid said in its 2019 Future Energy Scenarios report.”

- Power Purchase Agreements – where corporate buy green power directly from the owner of the renewable generation.

# Thank you

