



**Energy challenges in the industrial sectors:
the transition to a low-carbon economy**

**Luca Bragoli – Head of Institutional Affairs ERG Group
Milan, 2 December, 2016**



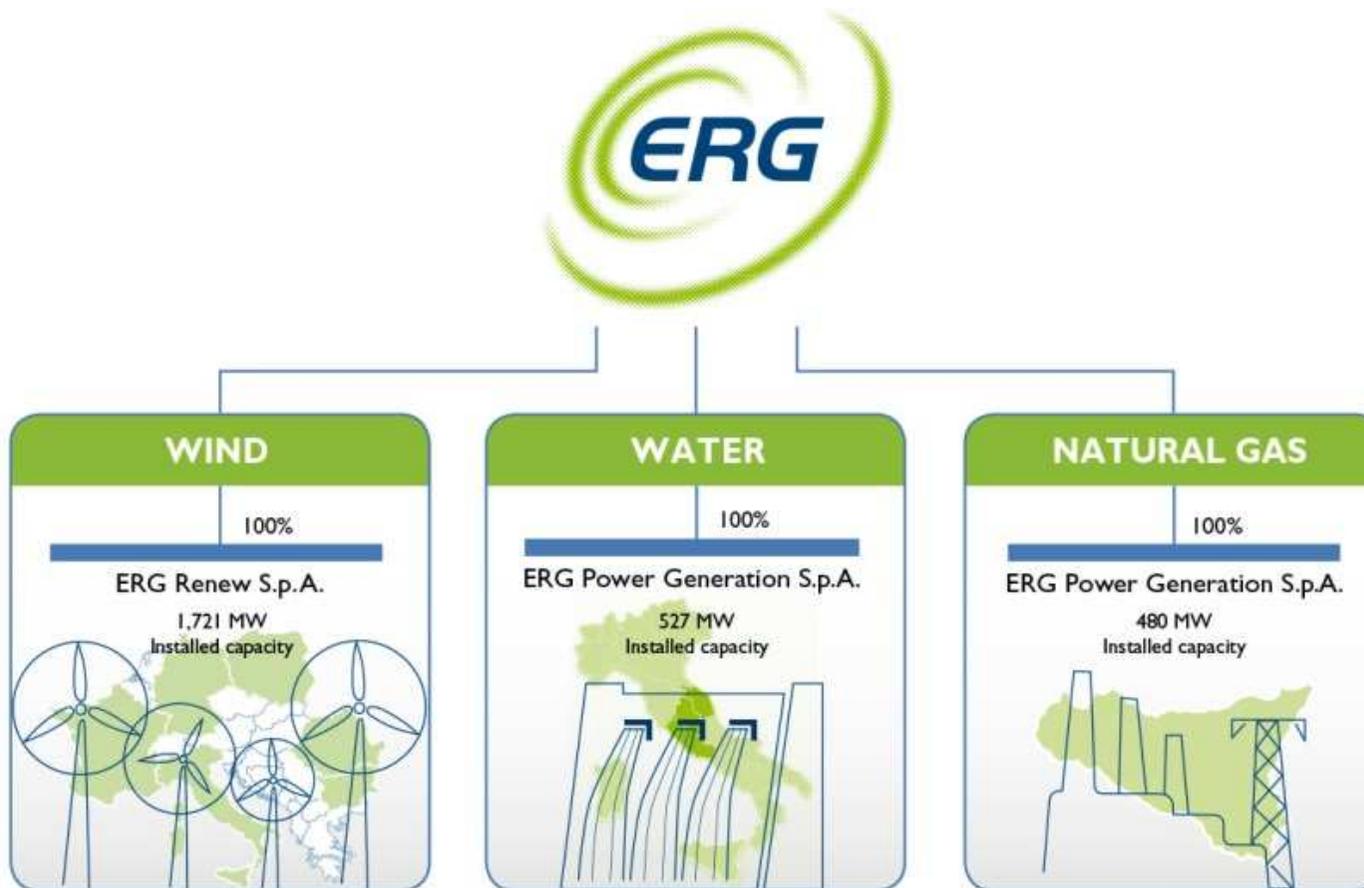


The ERG Group today

ERG has been operating successfully in the energy sector for almost 80 years.

We are the leading wind power operator in Italy and amongst the main players in Europe, with an installed capacity of 1,721 MW.

Listed on the Milan Stock Exchange, ERG is also active in the production of power from water and thermoelectric sources, with highly efficient plants and low environmental impact.



We are also involved in the fuel distribution sector through shares in the TotalErg JV (51% ERG).

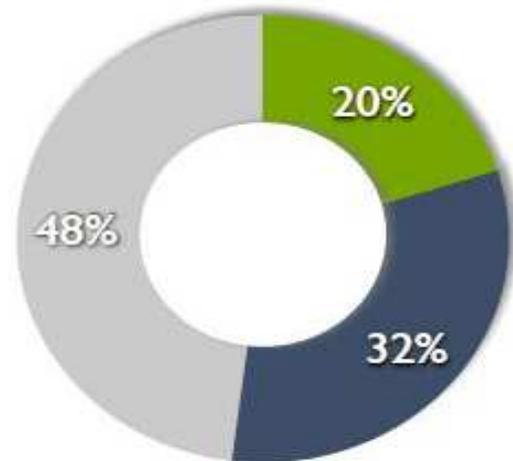


ERG investments in clean energy

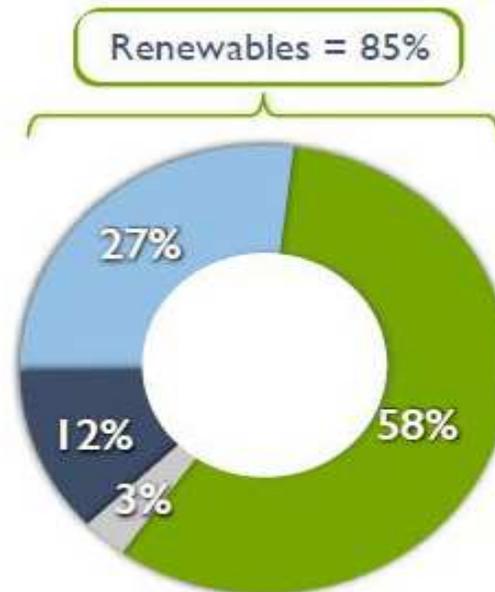
Since 2008 we have gone from 80% conventional/oil to 85% renewable, investing billions of euros in the process.

Capital employed

2008 (€2,2 bn)



2015 (€3,1 bn)



● OIL ● THERMO ● HYDRO ● WIND

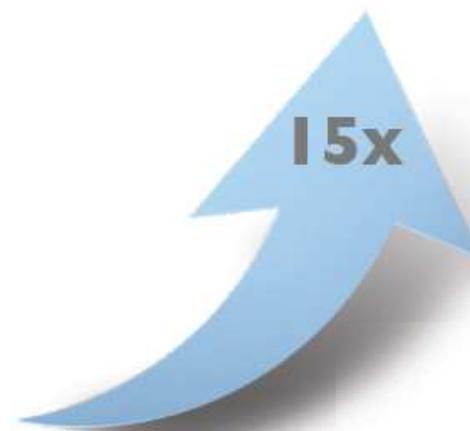


ERG emission reduction path

Our continual investment in zero-emission capacity, such as wind and hydro, helps avoid an increasing amount of CO₂ emissions.

From 2008 to 2016 we increased the amount of avoided emissions by a factor 15 from 125 to 1.900 kt.

The plan to add 600 MW of wind energy to our portfolio before 2018, will allow us to avoid, from 2016 to 2018, 9 Mt of CO₂ emissions adding up to a total of around 13 Mt since joining the renewable energy sector (baseline 2006 - Sustainability Commitments 2016-2018).



Conversion factor for avoided emissions based on methodology from Terna, published in their annual reports and referring to the electricity output of the Italian system.⁽¹⁾ Estimate based on the current asset base



2020 & 2030 emission reduction targets

2020 Target

- 20% Greenhouse gas emissions	20% Renewable energy	20% Energy efficiency	10% interconnections
- 40% Greenhouse gas emissions	27% Renewable energy	27% Energy efficiency	15% Interconnections

2030 Target



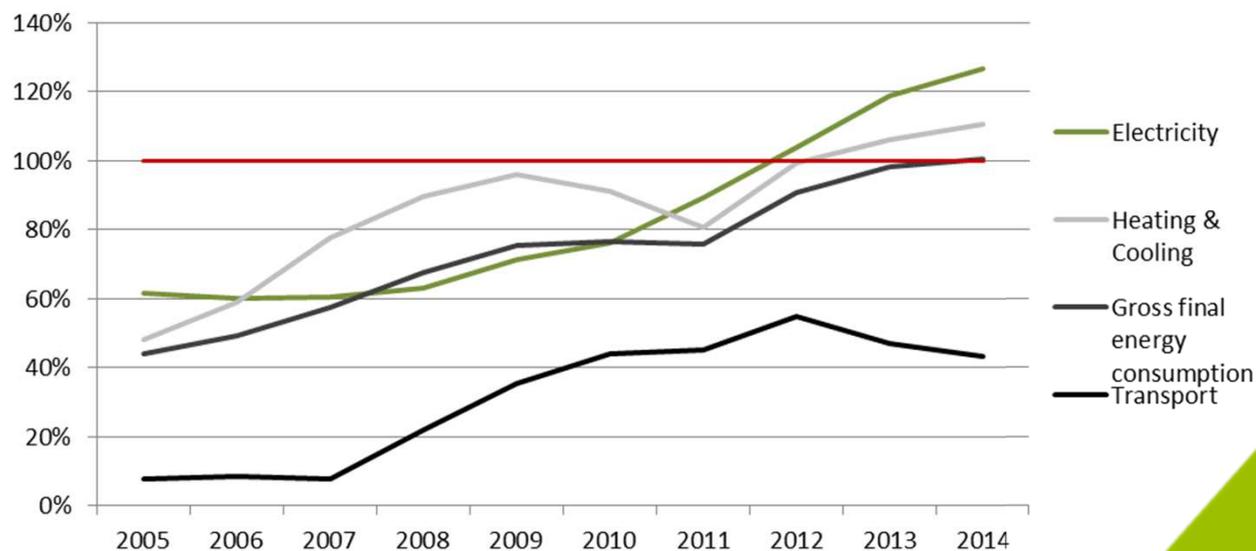
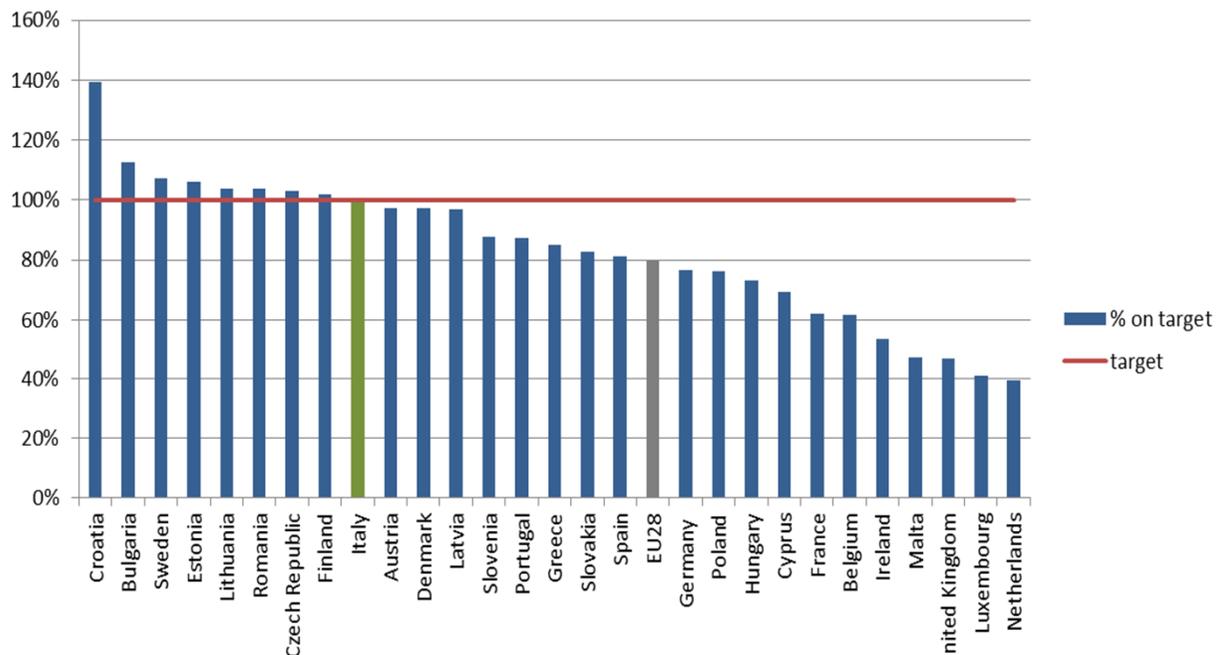


EU emissions reduction 2020 - Italy

In **2014 Italy reached its 2020 EU target** on emissions reduction on gross final consumption.

Between the three sectors with national emission reduction targets in Italy, the **Electricity sector has reduced its emissions the most (33,4%),** reaching 127% of the sector's 2020 target in 2014.

Actually an underestimation of the consumption of biomass (wood) as primary heating source in 2010 led to reaching the target prematurely. **Consequently the 2030 target will take more of an effort to reach.**



Source: ERG elaborations on data from Eurostat

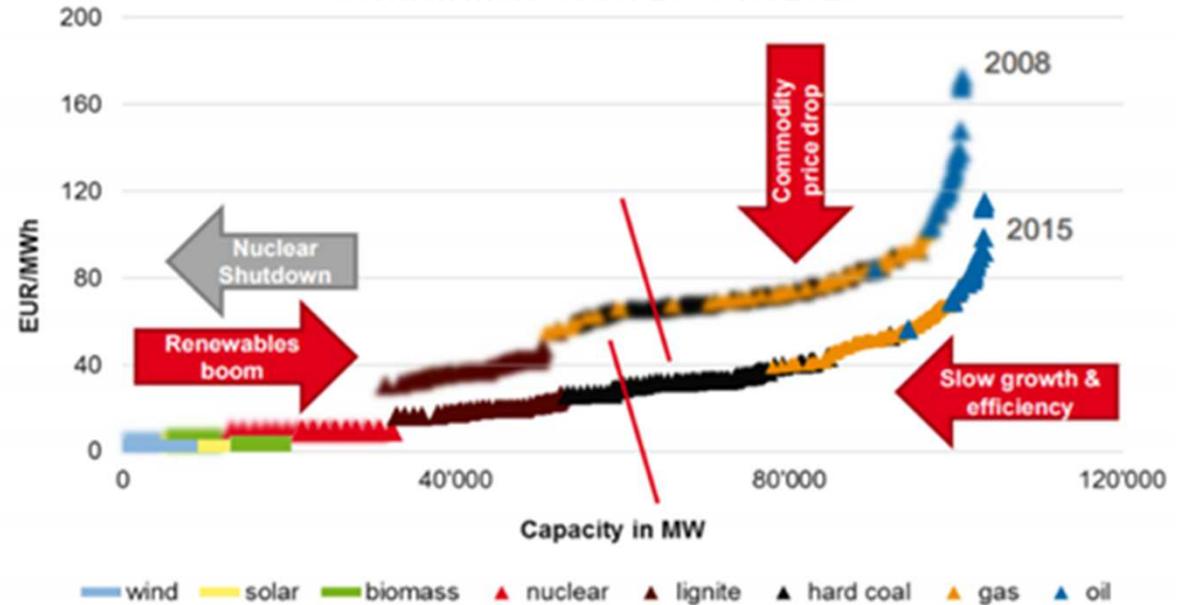


Falling electricity prices in Europe

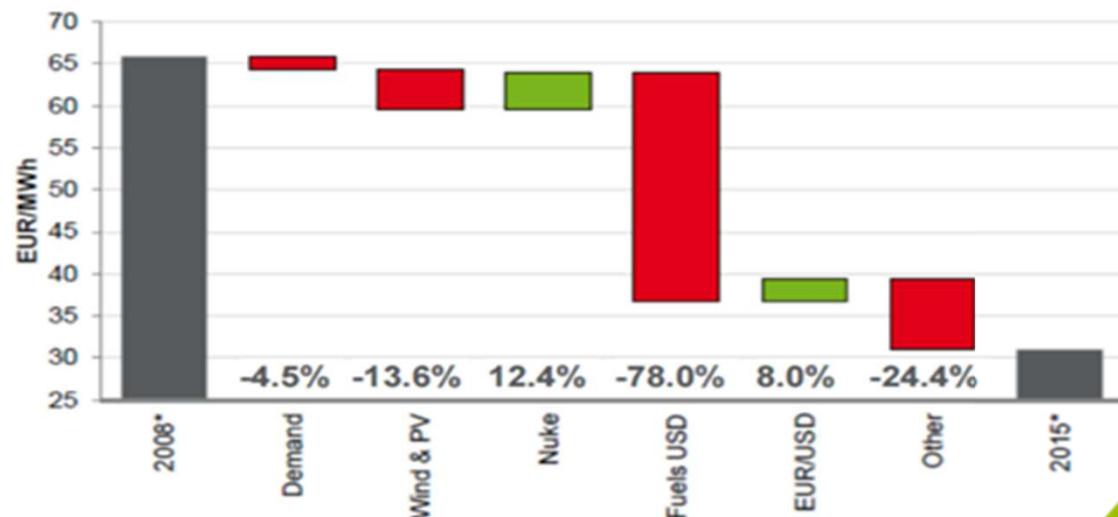
In **Europe** falling fossil prices, in particular coal, the low value of CO2, the increase of renewable energy together with a stagnant (or decreasing) demand have pushed down the electricity price equilibrium.

Prices have now reached a level that not only is unable to support new investments in RES, but neither investments in any other (conventional) energy source.

German merit order 2008 vs. 2015



Decomposition of the price destruction



Source: WindEurope and AXPO

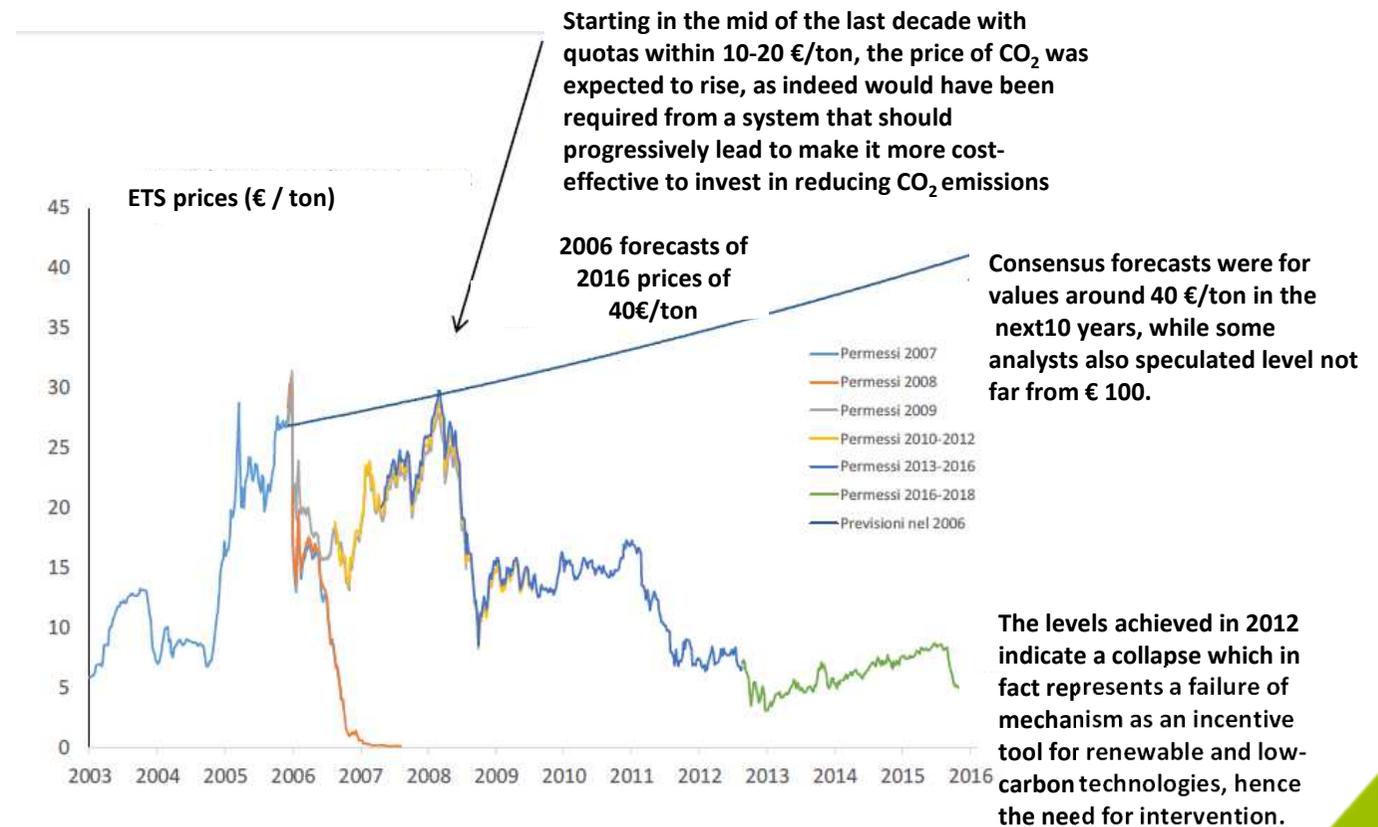


External costs of CO₂

The renewable sources are penalized by an emissions trading scheme which is unable to express the external cost – economic and environmental - of CO₂ emissions and therefore unable to change the merit order of conventional and renewable sources.

The original idea behind the EU ETS was to achieve a carbon price of 30 euro in 2020. At the moment prices are below 6 euro.

The EU-ETS is currently under revision in order to reflect the actual costs of CO₂ emissions. The reform will not have effect before 2021, why something has to be done in the meantime.



Source: Nomisma Energia elaboration of Intercontinental Exchange data (ICE), 2016

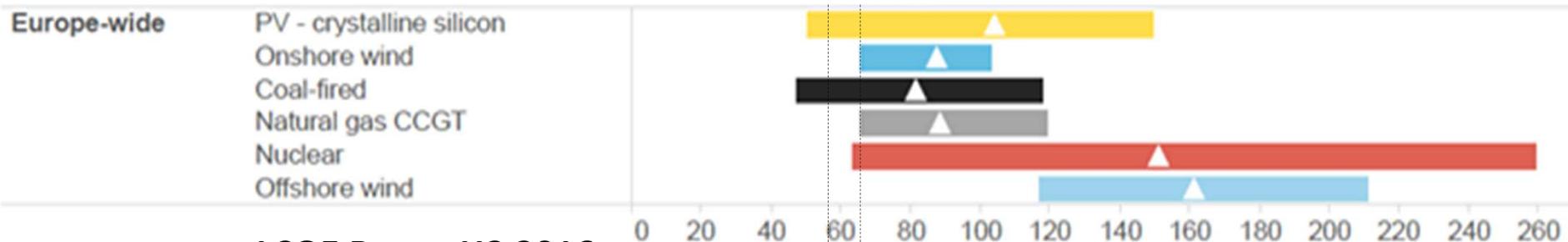


The decreasing LCOE of RES

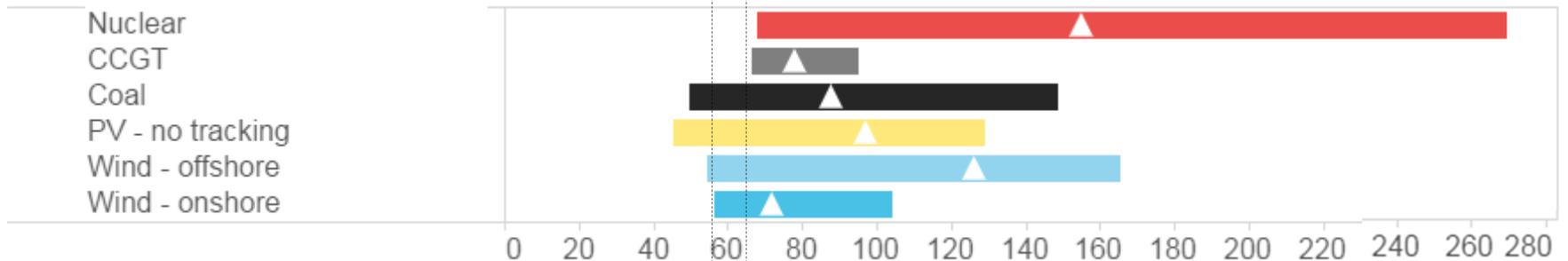
Along with the falling energy prices also the Levelized Cost of Energy (LCOE) of renewable sources – particularly wind and solar – is decreasing, making the two sources competitive with conventional sources such as gas and coal.

RES LCOEs are however still much higher than current marginal wholesale prices.

LCOE Range H1 2016



LCOE Range H2 2016



← LCOE low onshore wind H1 2016 = \$66

← LCOE low onshore wind H2 2016 = \$56



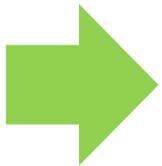
Our view for further renewables development

2030 PACKAGE

- target of 27% of RES penetration in energy consumption
- other than 40% reduction in GHG emissions,
- which implies a share of RES in power production above 55%.



To reach such ambitious levels and further develop RES, it is necessary to set...



- **Strong governance at European level to lead MS action plans**
- **ETS mechanism reform to achieve a functioning CO₂ price**
 - Possible solutions:
 - ✓ strong reduction of allowances amount [MSR strengthening]
 - ✓ Carbon floor prices [at a EU or national level]
 - ✓ EPS
- **Revenue stabilization through long term power purchasing agreement (PPA)**
- **Enhance V-RES integration in electricity markets**
 - ✓ Market gate closure
 - ✓ Liquid intraday market
 - ✓ Aggregation
 - ✓ Ancillary services
- **Improving electrification of energy demand**
 - ✓ domestic / heating / cooling
 - ✓ Mobility / transports
- **Repowering of end-of-life V-RES (wind) plants**



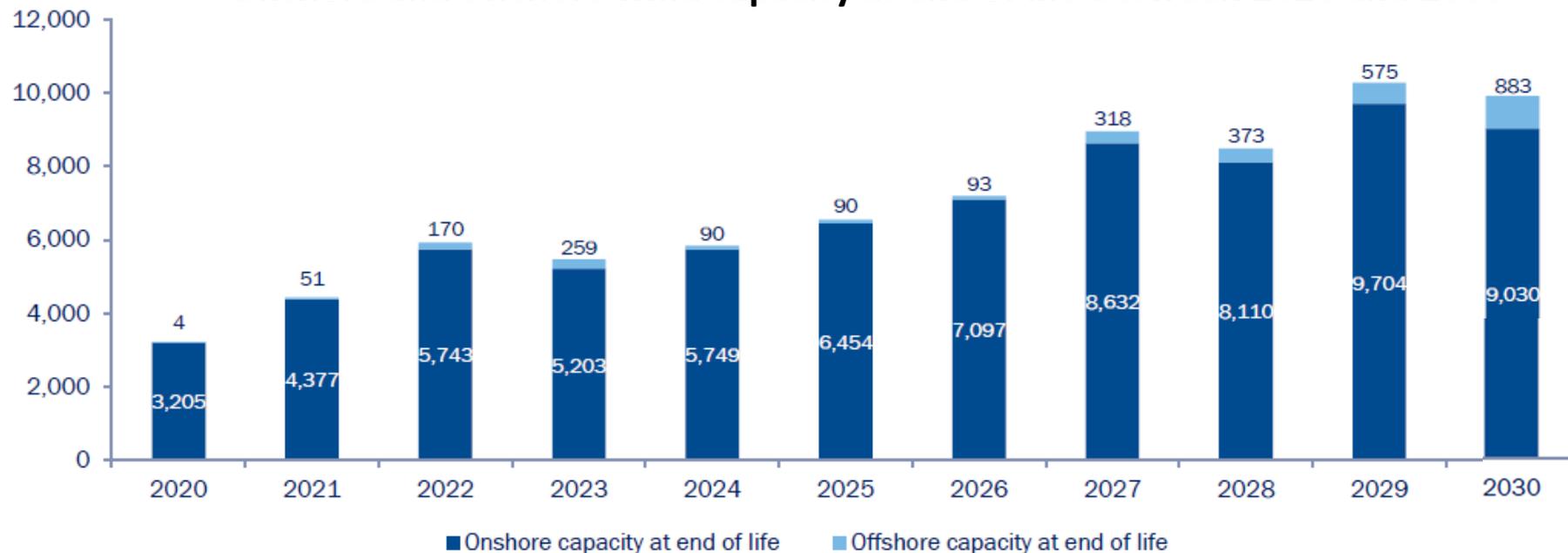
Repowering

Repowering is a clear opportunity for modernizing the European wind fleet with the newest technology available. Many countries will face declining wind energy production rates, if wind farms coming to their end of life are not upgraded or repowered (76 GW of installed power between 2020 and 2030).

In Italy 20% of wind power capacity (ca 9 GW) is more than 10 years old and, considering current depressed CO2 and wholesale prices, risk to be progressively dismantled.

Policies to support end-of-life measures – financial and procedural support - are needed to reach both national and European targets.

Onshore and offshore wind capacity at end of life between 2020 and 2030



Source: WindEurope, 2016

A high-speed photograph of a water splash against a clear blue sky. The water droplets are captured in mid-air, forming a circular ring that frames the central text. The background shows a bright blue sky with soft, wispy white clouds. The overall composition is clean and modern, emphasizing natural elements.

**Natural Energy.
Sustainable Future.**



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