Webinar organised by Elettricità Futura

EF Technology Watch Webinar Series:

Technology and R&D Funding Trends in the Wind Sector

Discussing with key Associations and leading Market Players

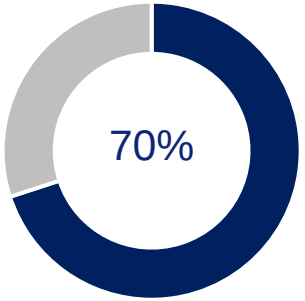
Online, 23rd July 2020

Welcome by Elettricità Futura

Elettricità Futura is the Italian leading association representing the national electricity industry. It encompasses electrical energy generators involved in RES as well as traditional sources, distributors, traders, retailers and service providers. It represents and stands up for its members interests in Italy and Europe, contributing to making today's electricity market more efficient, enhancing the sector and exploiting the potential of the energy transition.

Andrea Zaghi, General Director
Elettricità Futura

Elettricità Futura in figures:



of the **electricity consumed in Italy** is covered by companies that are part of Elettricità Futura

600	40,000	75,000 MW	1,150,000 km
OPERATORS	**WORKERS**	**INSTALLED CAPACITY**	**ELECTRICITY LINES**

We are member of:

CONFINDUSTRIA · CONFINDUSTRIA ENERGIA · FREE coordinamento · MOTUS-E · eurelectric · SolarPower Europe · Wind EUROPE · BioEnergy EUROPE · RES4AFRICA FOUNDATION

Panel

Moderator:

Nigel Hawkins,
Head of European Affairs and Studies
Elettricità Futura

Speakers:

Alessio Cipullo
European Affairs and Studies

Elettricità Futura

Davide Astiaso Garcia
Secretary General

ANEV

Marco Guarneroli
General Manager

Windfor, a company of Falck Renewables

Giancarlo Potenza
Innovation Project Manager

Enel Green Power

Gianluca Teodori
Country Manager Italy

ERG

Alexander Vandenberghe
Advisor Research & Innovation

WindEurope

Webinar organised by Elettricità Futura

Setting the Scene:
Wind technology trends and presentation of the EF Technology Watch Newsletter – July 2020 Issue

Alessio Cipullo
European Affairs and Studies, Elettricità Futura

Online, 23rd July 2020

Wind Energy Technology has come a long way….

Traditional Windmill in Utrecht, The Netherlands

One of the first wind turbines made in Europe – a 22 kW Bonus model, 1982

Vindeby in Denmark as the world's first offshore wind farm, 1991

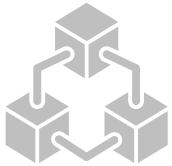
107 m long LM Wind blade for GE's Haliade-X 12 MW turbine, 2019

Source: Wikipedia, WindEurope, GE

Examples of relevant Emerging Technologies

Several emerging technologies are having or are likely to have a profound impact on the development of the wind and power sector in general. As a non-exhaustive list…

Smart materials

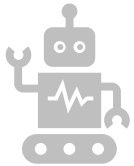


Internet of Things

Data science applications

Information and Communication Technologies (such as blockchain)

Artificial intelligence

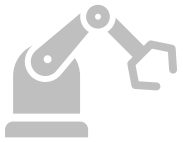


Wearable technologies

Augmented and Virtual Reality

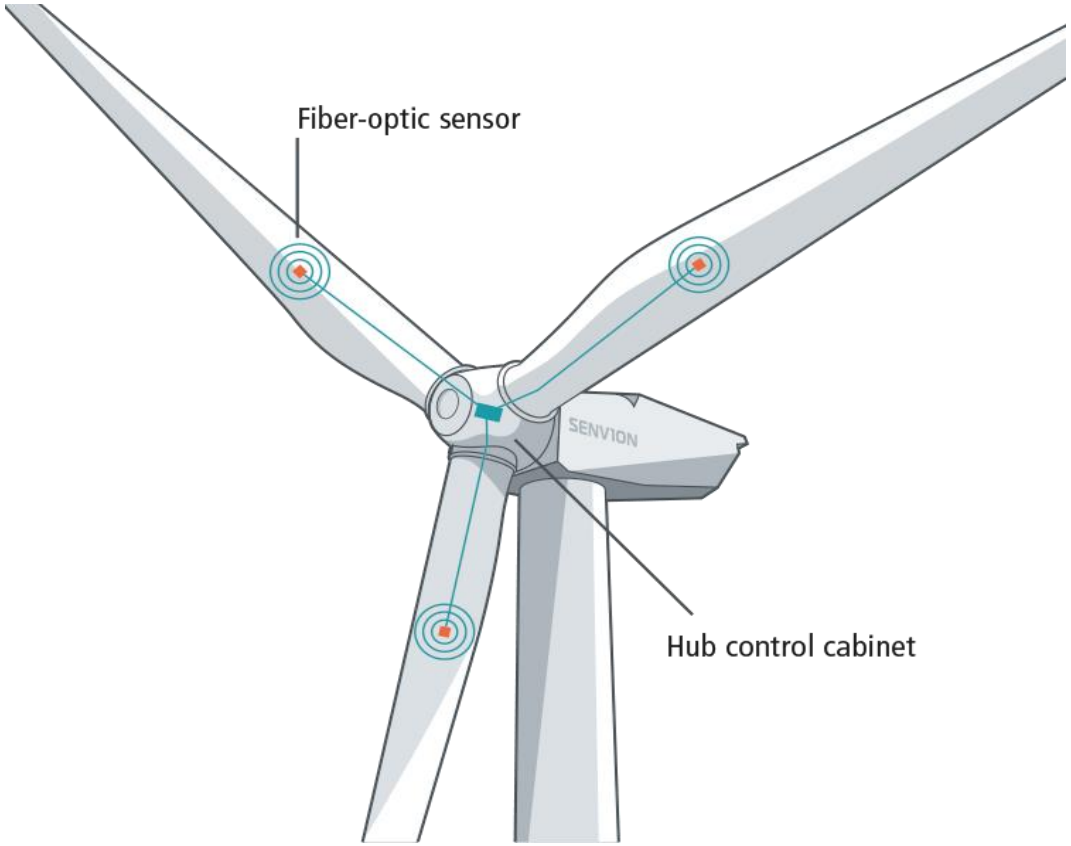
Robotics and autonomous systems

Advanced design and manufacturing concepts



Long duration energy storage

Smart Materials

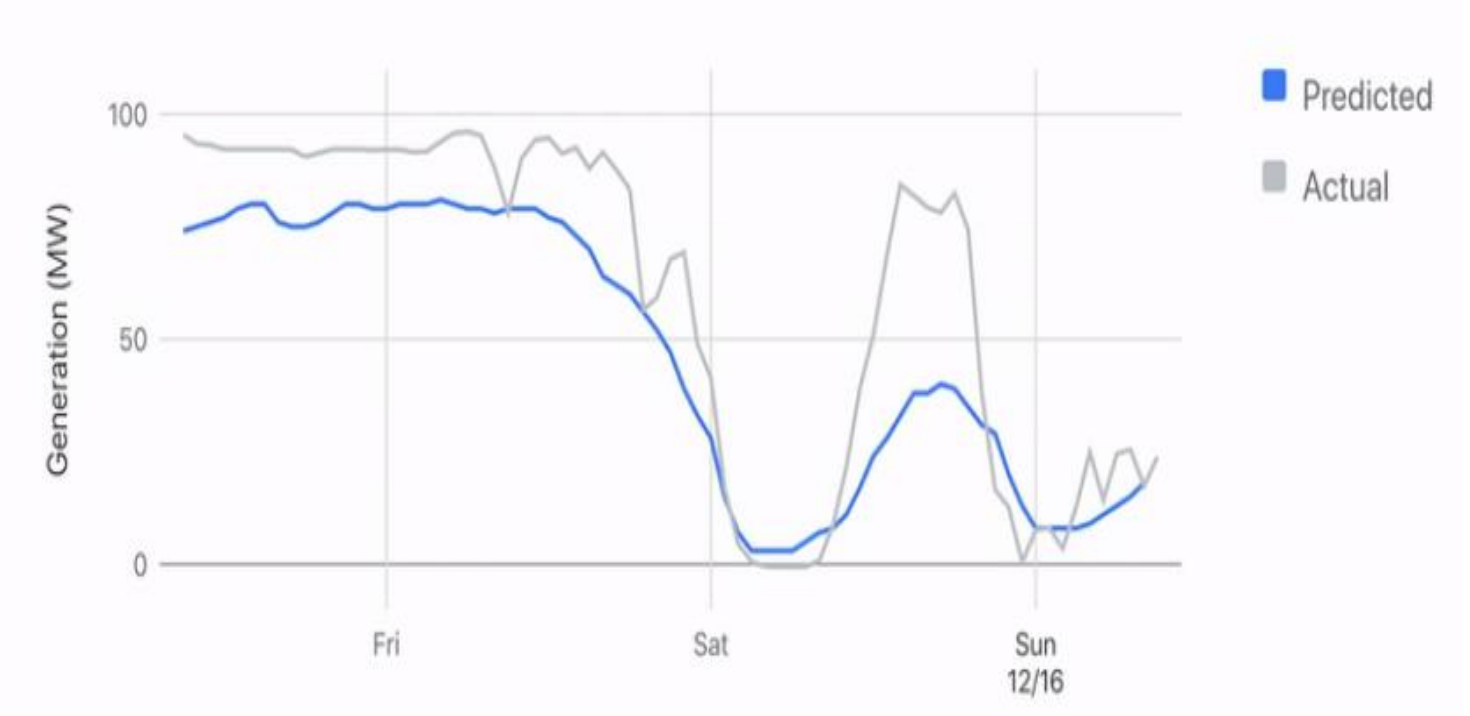


- Example of "**smart composites**" embedding optical fibre sensors in wind turbine blades to monitor structural performance, optimise performance and maintenance and potentially extend the operating life of the turbine itself

Source: EF Technology Newsletter #3 2020 and references thereby

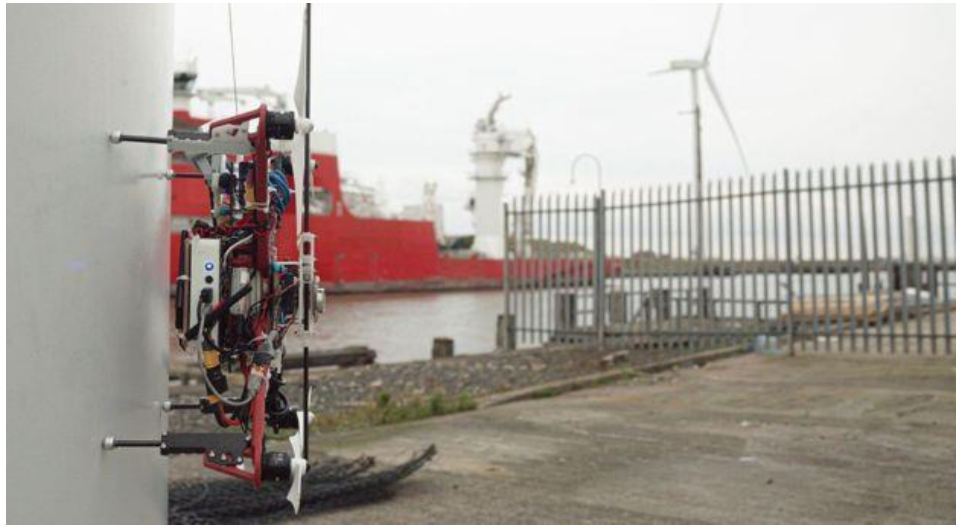
Artificial Intelligence

- DeepMind, a Google company, has developed an algorithm to provide a **forecast of the output of a 700 MW wind farm 36 hours in advance** and allow the optimization of dispatching and delivery to the grid. According to DeepMind, this has **increased** the value of **electricity produced by 20%**



Source: EF Technology Newsletter #3 2020 and references thereby

Robotics and Autonomous Systems

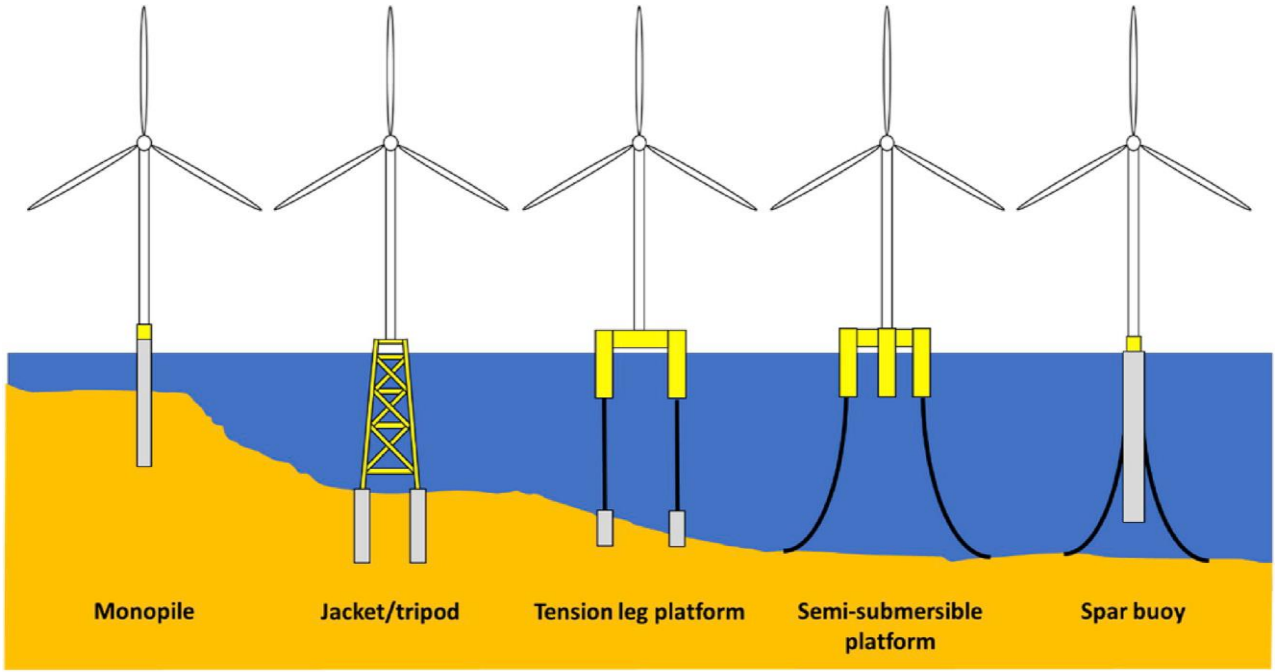


- The combination of **Robotics** and **Artificial Intelligence** (AI) might disrupt the way maintenance and inspections are done in the power sector, for instance by avoiding/limiting human intervention in labour-intensive and dangerous tasks
- They can be also used in a context where social distancing and stringent health measures e taken (e.g. **COVID-19 emergency**)

Source: EF Technology Newsletter #3 2020 and references thereby

Advanced design and manufacturing concepts

- **Floating wind** is not a novel technology, but a wide adoption could further boost offshore wind installations

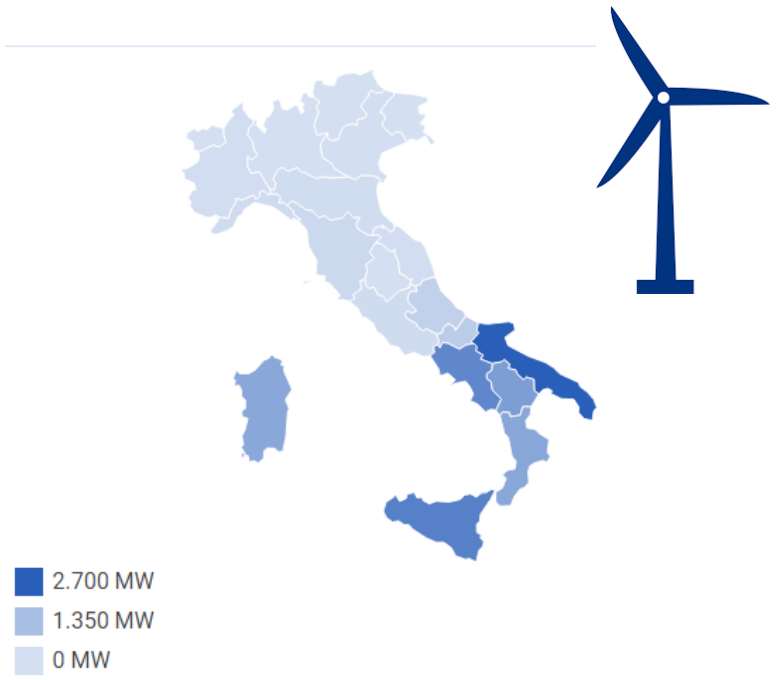


- Other more “exotic” concepts exist, such as: **multirotor turbines**, airborne wind energy, wind turbine with tip-rotors, …

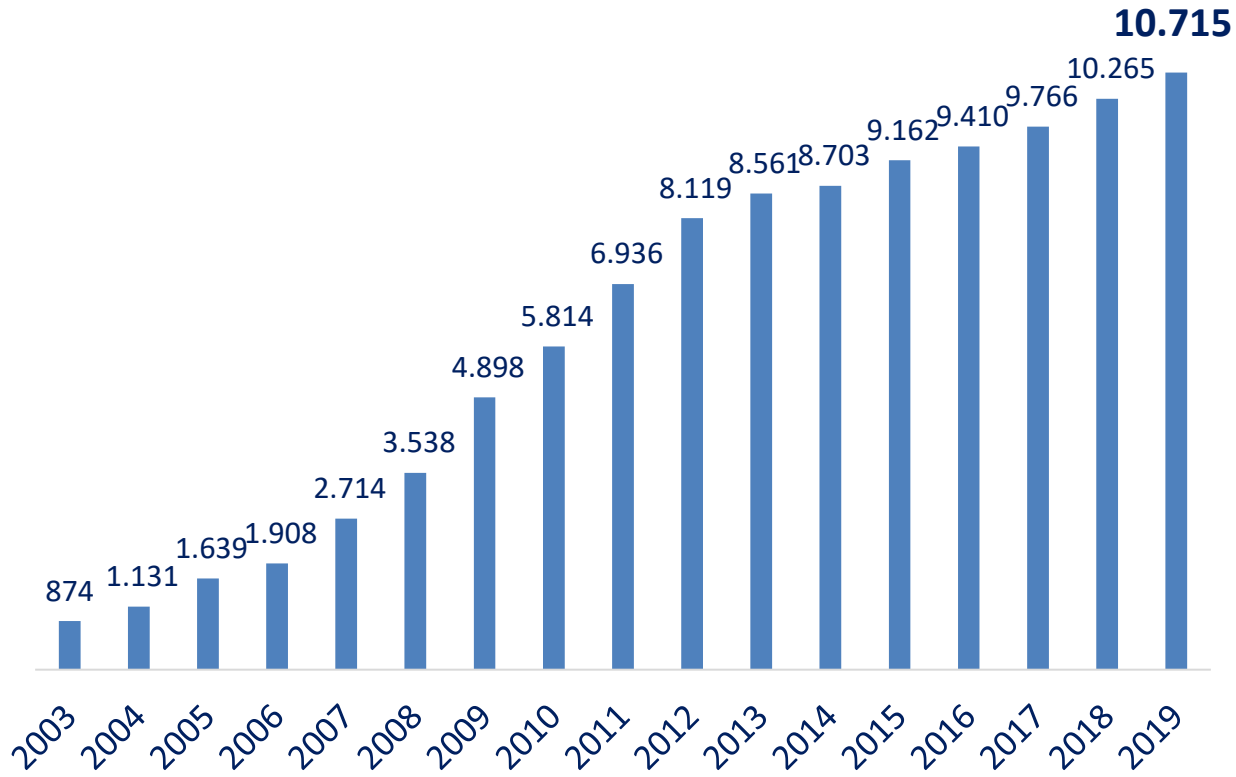
Source: EF Technology Newsletter #3 2020 and references thereby

The Italian wind energy landscape

Geographical wind capacity distribution in Italy*



Cumulative wind capacity evolution in Italy [GW]*

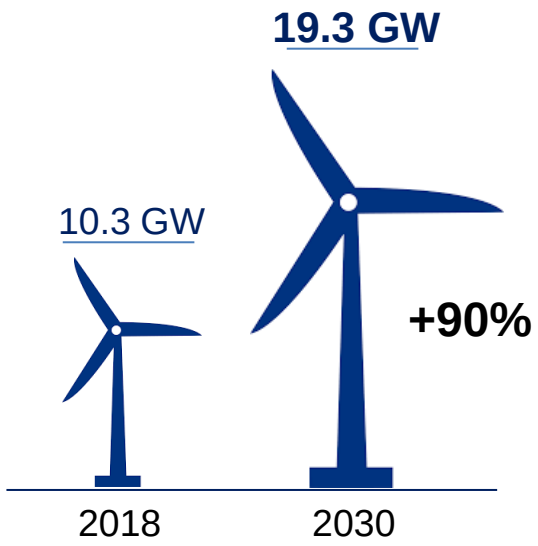


450 MW net wind capacity installed in Italy in **2019 according to official data**
No offshore wind capacity is installed today in Italy

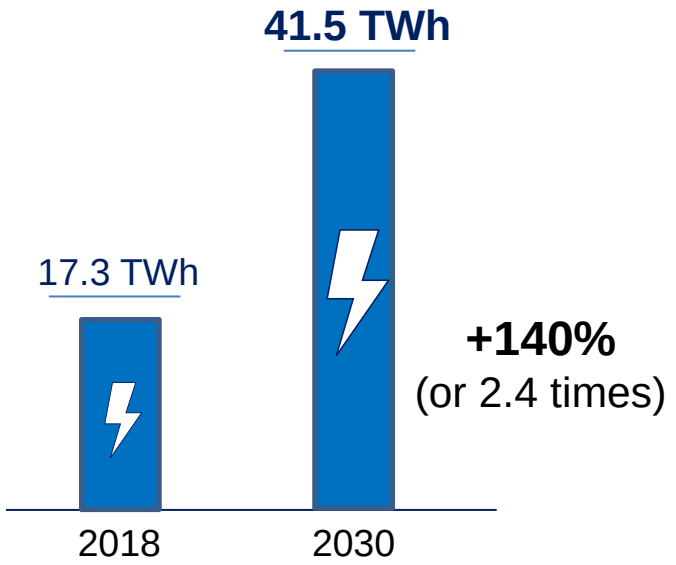
*Source: * GSE and Terna (Italian TSO)*

Wind capacity and energy NECP targets in Italy

Evolution of the overall wind capacity according to the Italian NECP proposal



Evolution of the overall wind energy production in Italy according to the Italian NECP proposal



Technology Evolution will be key in achieving the **NECP targets** and it will be necessary to **shape the regulatory and business framework** to help relevant emerging technologies contribute in the energy transition process

Source: Italian National Energy and Climate Plan (NECP) submitted to EC in December 2019 **Terna (Italian TSO) preliminary data*

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Technology Watch

Issue #3 - 2020

Technology Watch is the Elettricità Futura initiative to monitor global technology trends having the power sector at their heart, thanks to contribution of our Members and Partners

EF Technology Watch Webpage

Concluding Remarks

- **Technology evolution** is a key driver for the wind sector and power sector in general

- Emerging technologies such as **Smart Materials**, **Artificial Intelligence**, **Autonomous Robots**, **Novel design and manufacturing concepts** can shape the future wind sector and also support during the **COVID-19 emergency**

- Favouring the definition of a clear and well-balanced **regulatory and business framework** will be key to help relevant emerging technologies contribute in the **energy transition process**

Nigel Hawkins
Head of European Affairs and Studies

nigel.hawkins@elettricitafutura.it

Alessio Cipullo
European Affairs and Studies

alessio.cipullo@elettricitafutura.it

Elettricità Futura
Rome - Piazza Alessandria, 24 - 00198
Milan - Via G.B. Pergolesi, 27 - 20124
T +39 06 8537281
www.elettricitafutura.it

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