Opportunities and challenges for utility scale Photovoltaics

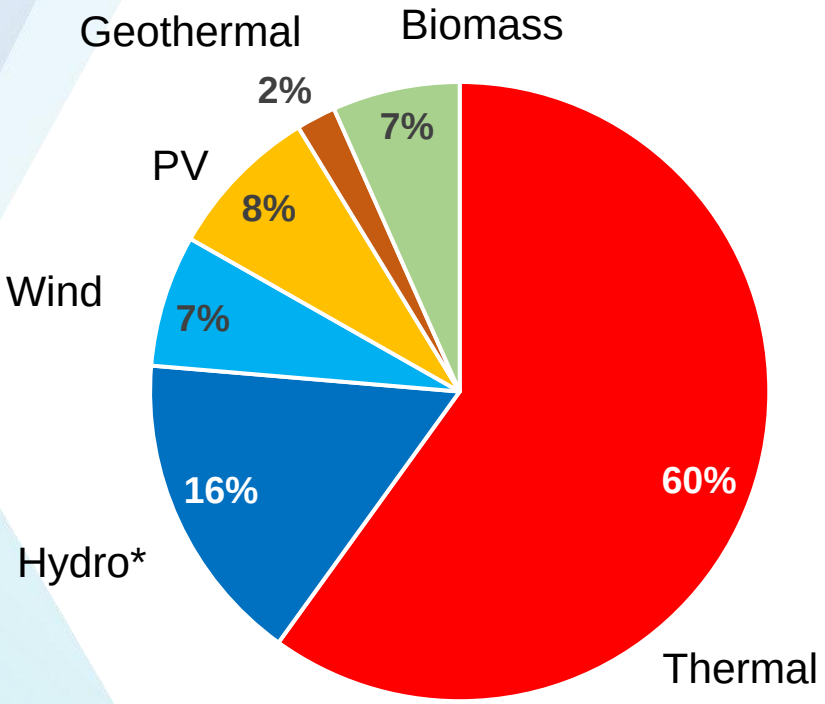
Webinar: “Opportunities and challenges for utility scale Photovoltaics”
Online, 5 november 2020

Role and perspectives of Utility Scale PV in Italy

Alessio Cipullo
Head of European Affairs, Studies and HSE

The electricity production by RES in Italy was equal to 39.4% of the total in 2019

BREAKDOWN OF GROSS ELECTRICITY PRODUCTION BY SOURCE (2019)



OVERALL GROSS ELECTRICAL ENERGY PRODUCTION IN ITALY (2019):

293,853 GWh (+1.4% vs 2018)

GROSS ELECTRICAL ENERGY PRODUCTION BY RES (2019):

115,778 GWh (39.4% of total)

Italy has a balanced generation mix, ready for the energy transition

Source: EF elaborations on Terna's 2019 annual data *RES = Renewable Energy Sources*

**Note: Hydro percentage in the histogram includes pumping production (equal to 0,6% of the total)*

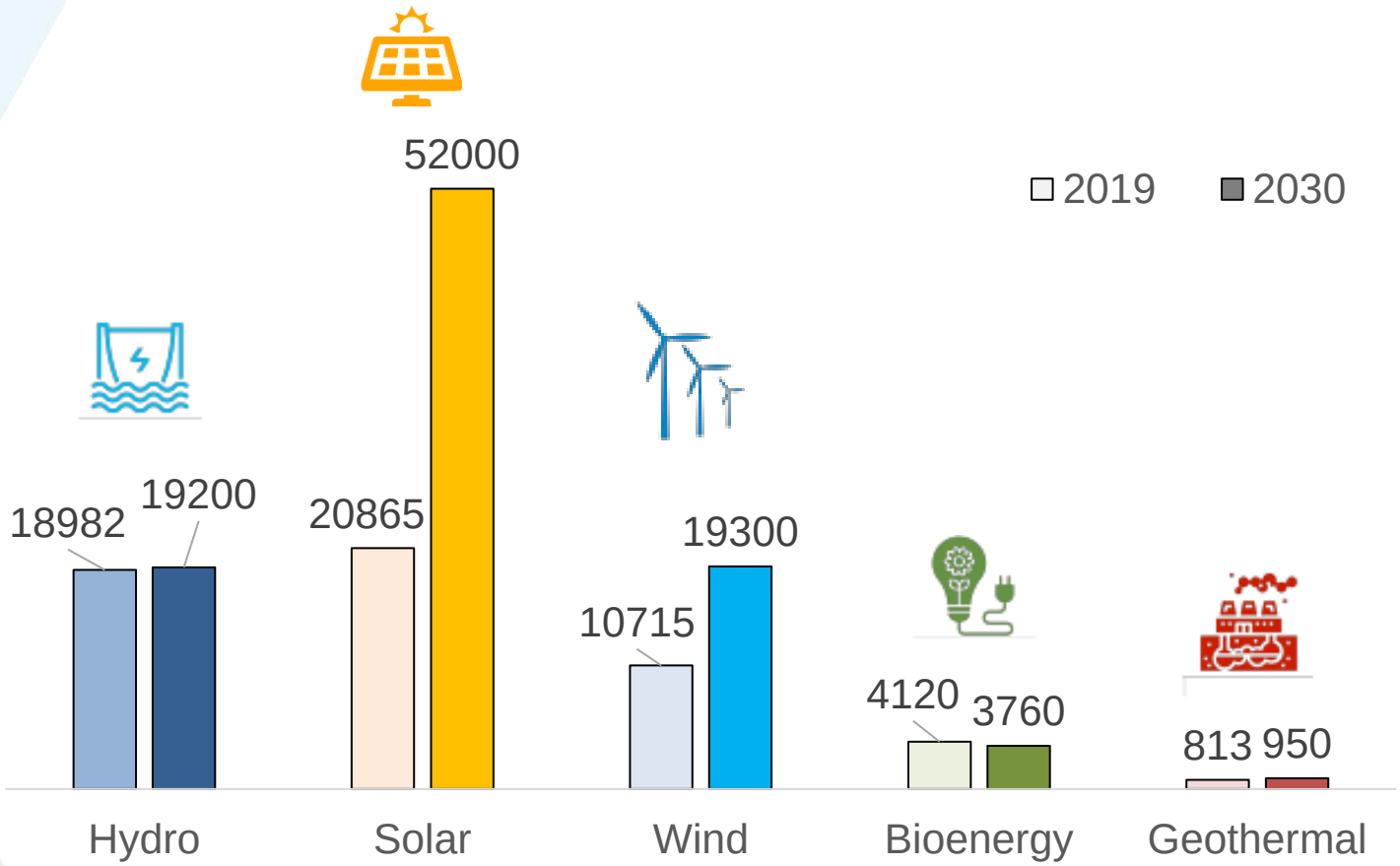
Energy transition: 2030 targets for Italy

	Clean Energy Package NECP 2019	Green Deal REVISED NECP*
GHG emissions reduction wrt 1990 (in Europe)	40%	55%**
RES share of inland gross consumption **for electricity**	55%	70%
RES share on gross **final energy** demand	30%	40%***
Energy efficiency target (wrt to PRIMES 2007 scenario)	43%	58%***

** Still to be defined by the Italian government*
***official proposal by the Commission – September 2020*
****preliminary EF elaborations based on the official proposal by the Commission – September 2020*

RES 2030 objectives according to the Italian NECP

COMPARISON OF EXPECTED RES 2030 CAPACITY VS 2019 – CEP SCENARIO [MW]



+40 GW

RES capacity needed

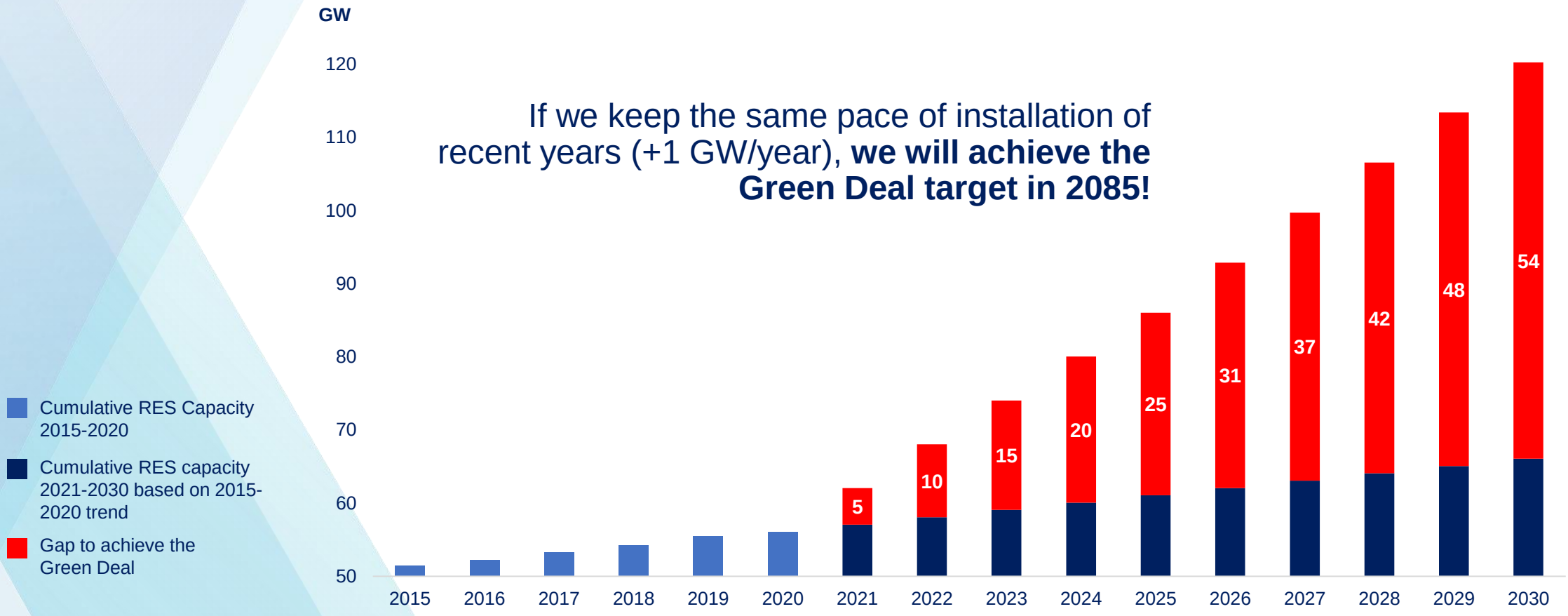
According to the current Italian NECP

According to preliminary EF estimates, at least **+65 GW RES capacity** will be needed in the 2030 Green Deal Scenario, with **up to 100 Billion euros** cumulative investments and **90,000 new jobs** across the power sector in Italy

Source: Italian National Energy and Climate Plan (NECP) – December 2019, Terna

RES development needed in Italy to achieve the Green Deal 2030 target

If we keep the same pace of installation of recent years (+1 GW/year), **we will achieve the Green Deal target in 2085!**



Source: EF elaborations on data from the National Energy and Climate plan – December 2019 and European Commission

The role of Innovation and Technology in the Solar PV sector

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Technology and Innovation in the Solar PV sector and its role for the Green Recovery

Alessio Cipullo
Head of European Affairs, Studies and HSE

Image linked to the development of the first photovoltaic cell at Bell Labs in 1954

Image linked to the advertising, in 1956, of the first photovoltaic cells produced by Bell Labs

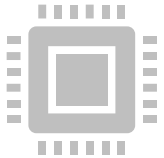
Source: https://www.elettricitafutura.it/Ufficio-Studi/Technology-Watch-/Focus-Solare-Fotovoltaico_2177.html

Examples of relevant Emerging Technologies

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

Smart materials

Robotics and autonomous systems



Data science applications

Information and Communication Technologies (such as blockchain)

Wearable technologies

Artificial intelligence

Augmented and Virtual Reality

Internet of Things

Smart Sensing

Advanced design and manufacturing concepts

In 2017, the Massachusetts Institute of Technology (MIT) developed a transparent photovoltaic cell that combines low-cost organic materials with **graphene electrodes**.

The ability to use graphene has made possible prototypes of fully flexible, low-cost and transparent solar cells that could turn virtually **any surface into a source of electrical energy**

Source: https://www.elettricitafutura.it/Ufficio-Studi/Technology-Watch-/Focus-Solare-Fotovoltaico_2177.html

Digitisation and its applications could have significant benefits also in relation to the current situation of the COVID-19 emergency.

For example, the use of **drones enabled by artificial intelligence** allows remote inspections and interventions by limiting human presence in the field and allowing significant savings in terms of costs for the management and maintenance of the plant

Source: https://www.elettricitafutura.it/Ufficio-Studi/Technology-Watch-/Focus-Solare-Fotovoltaico_2177.html

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