

EU Storage Market, Status Of Energy Storage In Europe And Key Developments

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Manufacturing and deployment of
battery storage systems

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EU Energy Transition

What is planned for 2030 and 2050

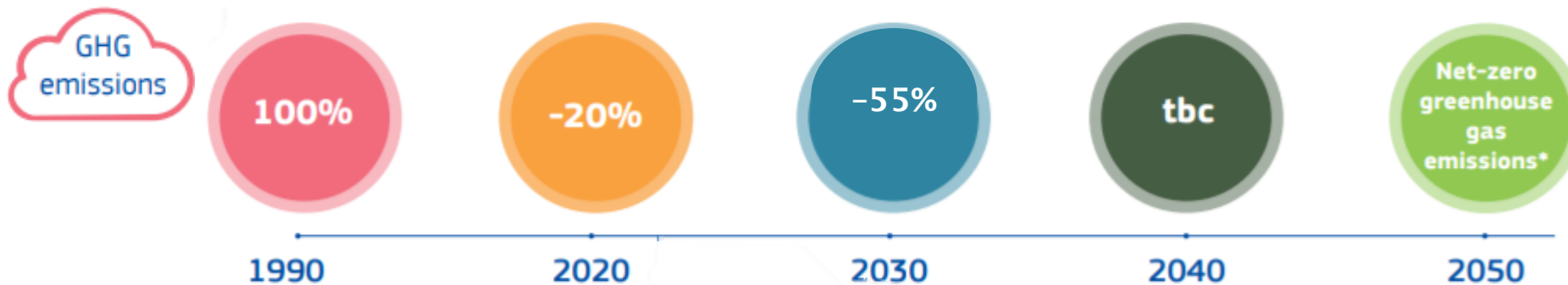
❖ EU Green deal– general goals

- ✓ 2030: reducing net GHG emissions by 55%
- ✓ 2050: becoming climate neutral

❖ Goals for energy sector

- ✓ 2030: up to 67% renewable electricity
- ✓ 2050: more than 85% renewable electricity

Source: Fit For 55 impact assessment



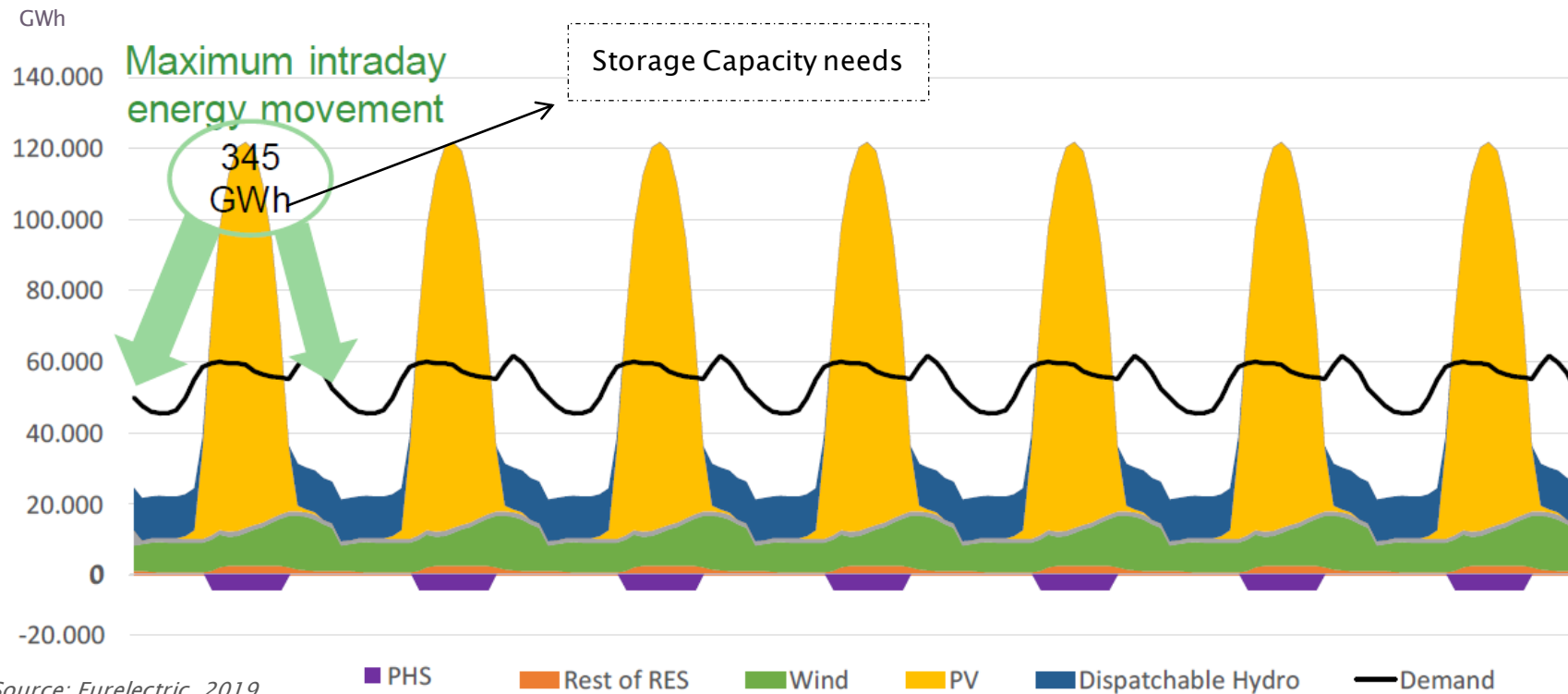
Source: European Commission, 2019

⇒ Problem: Most renewable sources are variable (e.g. solar PV and wind)

The Role of Energy Storage for the Energy Transition

Intra-day storage – The example of Spain in 2050

In 2050: Total demand – 470 TWh; Peak Demand – 70 GW



Source: Eurelectric, 2019

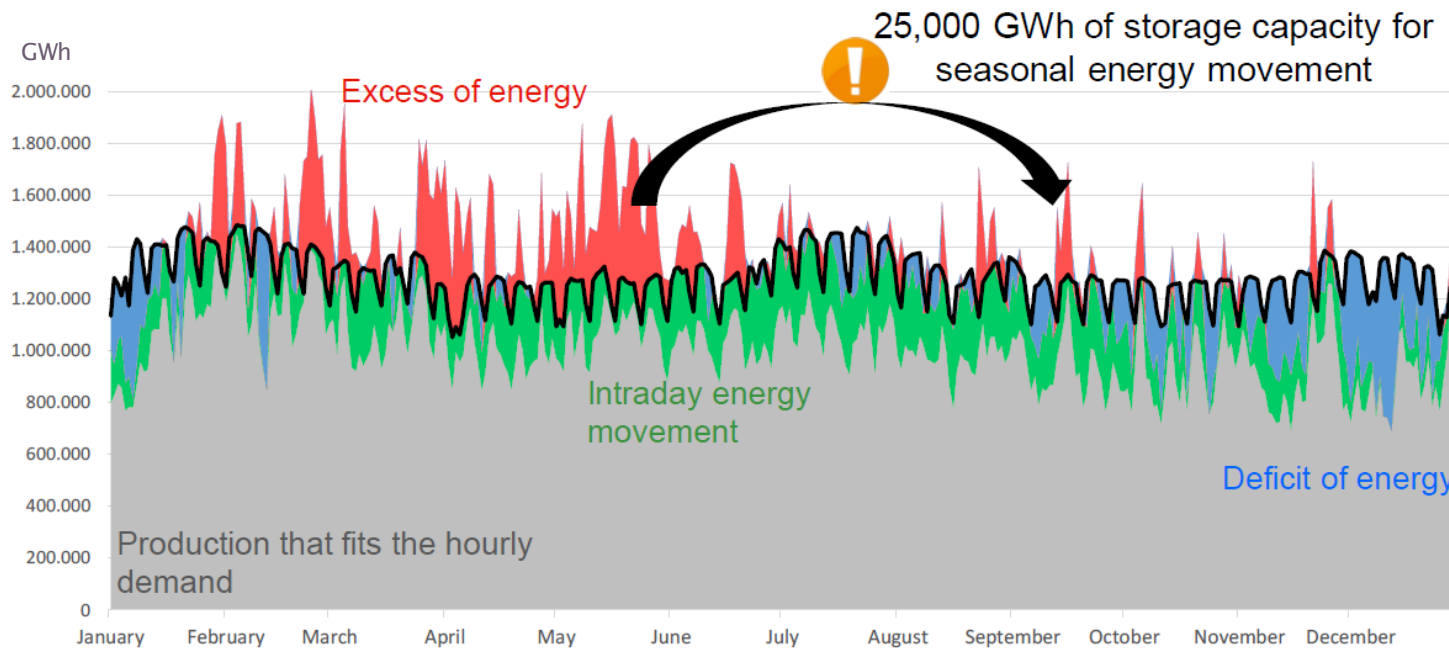
by 2050



97% renewable energy in the total energy mix

The Role of Energy Storage for the Energy Transition

Seasonal needs – The example of Spain in 2050



Source: Eurelectric, 2019

ES can provide seasonal storage – 72 times the capacity needed for intraday storage

How to minimise curtailment?

The role of Energy Storage

The higher the penetration of renewable energy, the higher the need for flexibility



Flexibility options:

Demand Side Management

Interconnectors

Energy Storage

Only **energy storage** can provide the critical 'energy-shifting' service reducing Renewable Energy Sources curtailment



Energy Storage technologies can store energy when production in excess and discharge when needed

The importance of Energy Shifting

Possibility of using the full potential of RES

Installing 20GWh of energy storage in the UK

Halves the curtailment of wind and enables the use of 1,8TWh electricity instead of wasting it

Corresponds to the annual consumption of over 400.000 UK households

Source: LCP, 2021

EU Energy Storage Key Developments

Clean Energy Package

- **Technology neutral definition** for energy storage
- Requires system operators to move towards **market-based tendering of flexibility services**
- **Support to active consumers**
- **High Renewable Energy Sources targets** open up possibilities and need for more flexibility services

Renewable Energy Directive

Establishes rules instructing Member States to increase the share of renewable energy sources (RES) in **heating & cooling** by 1.3% annually (Art. 23)



Drive demand for thermal storage

EU Energy Storage Key Developments

Electricity Directive

Establishes the use of **dynamic price contracts** (Art. 11) meaning electricity tariffs varying during the day depending on supply and demand. This incentivises **active customers** to modify their consumption and invest in energy storage



Time-of-Use and
Energy storage
investment

Energy Taxation Directive

Double taxation is one of the main regulatory barriers for Energy Storage deployment. The new Directive proposal considers energy storage facilities as **redistributors** so to avoid double taxation.



Reduce barriers that
hamper robust
storage business case

TEN-E Regulation

Aims to **connect regions** currently isolated from European energy markets and considers **flexibility** as a tool to improve infrastructure planning for **energy system integration**. Although the revision excludes **natural gas** from priority corridors, fossil fuels projects may still de facto be selected.



Improvement and
development of
energy infrastructure

EU Energy Storage Key Developments

EU Recovery and Resilience Facility

- €723.8 billion in loans and grants
- Climate target of 37% for each Member State's recovery and resilience plan

The RRF has the potential to play a decisive role in **accelerating energy storage deployments**:

- 3 out of 7 “Flagship Areas” for investments and reforms are of particular interest for Energy Storage:

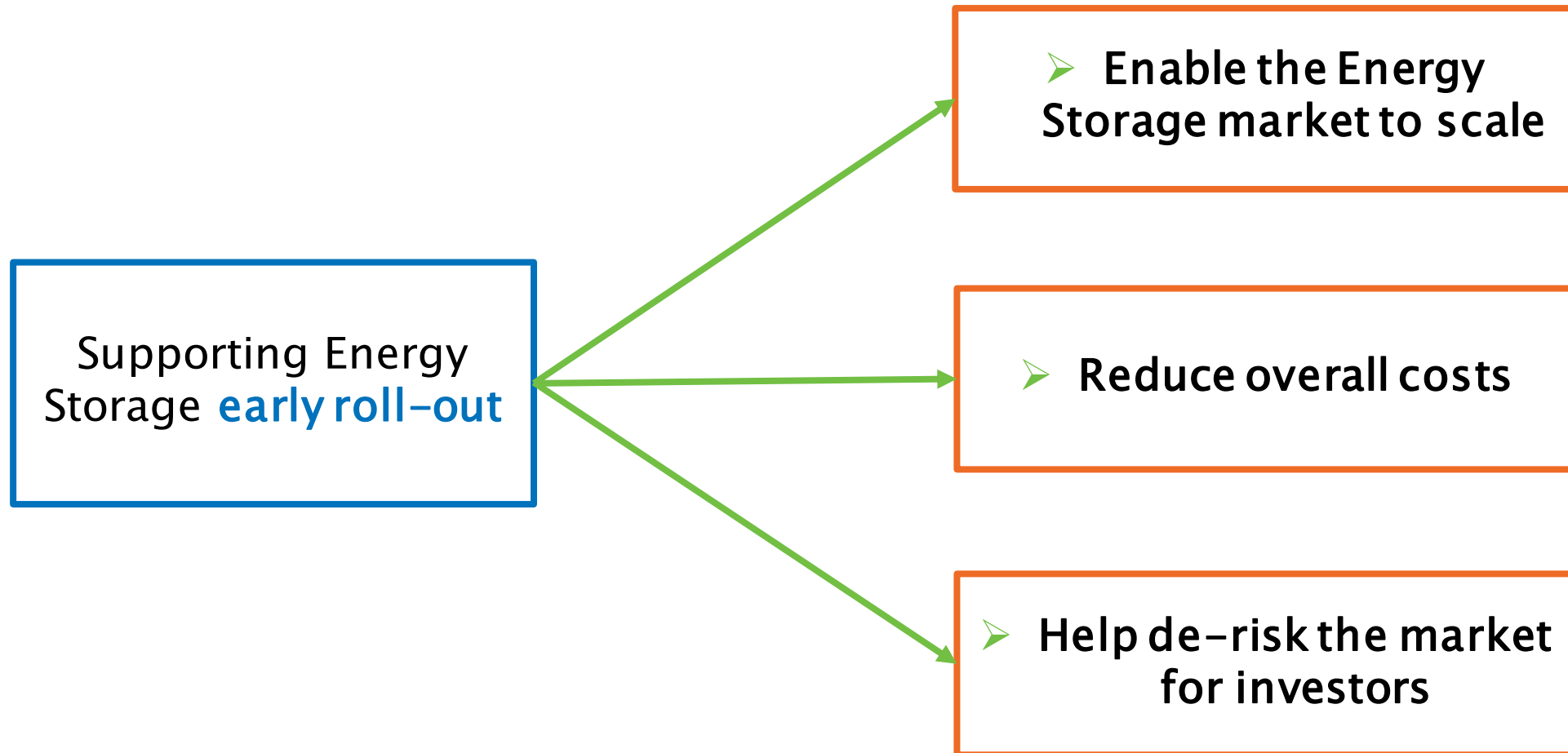
✓ Power up ✓ Renovate ✓ Recharge and Refuel

In most of the RRFs, **too little attention and funding** is dedicated to the energy storage sector.



Energy Storage early deployment

Significant benefits from supporting Energy Storage early deployment

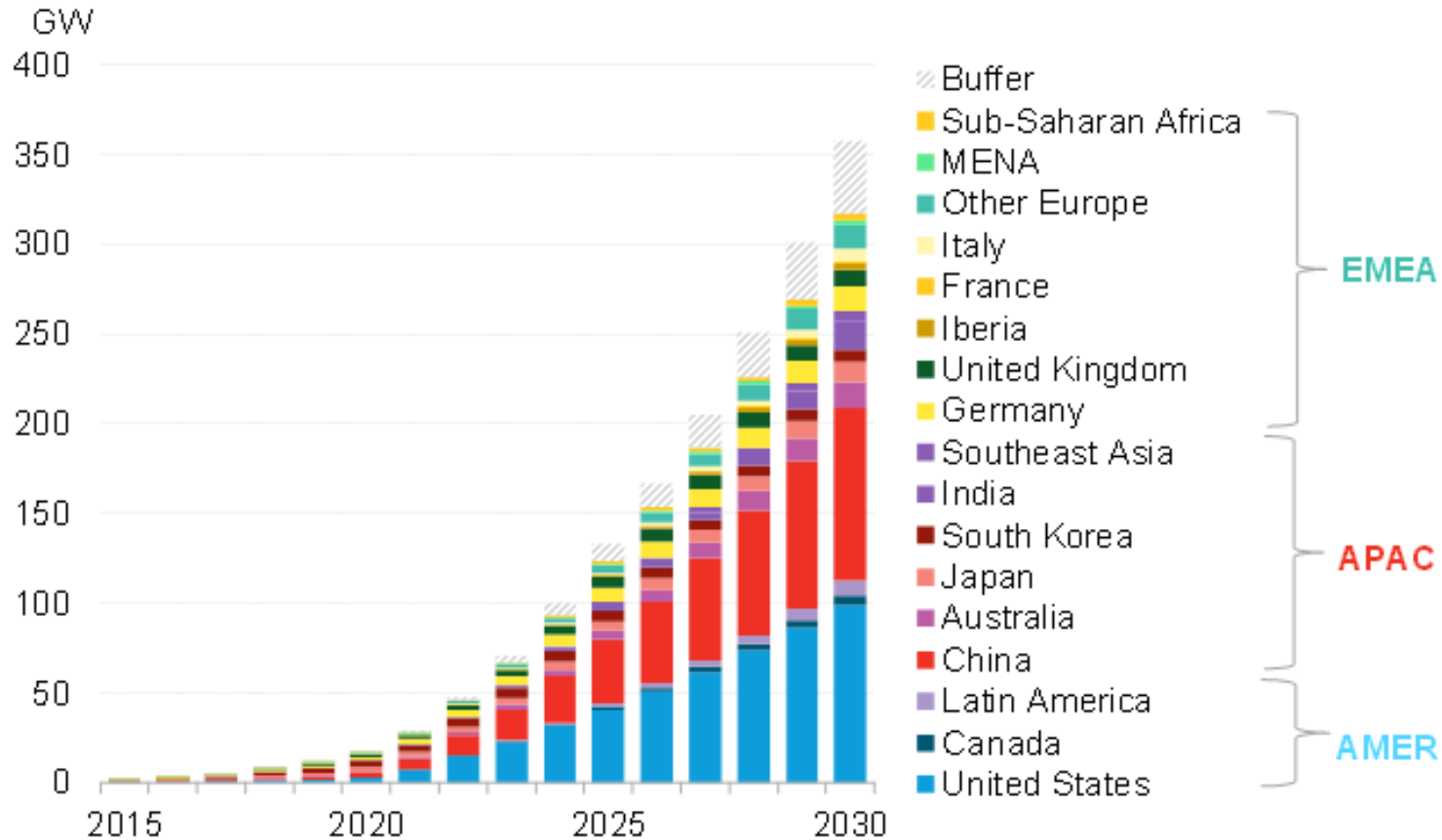


What to focus on:

- UK – Ireland **energy market** → example of how services can be designed and launched (cooperation, innovation, and transparency between the DSO and TSO)
- **Dispatchable Renewable Energy Sources** are necessary to ensure the secure and cost-effective operation of the network
- Need for **long term contracts**: i.e. UK has Enhanced Frequency Response (EFR) contracts which are aimed at storage assets to provide frequency response in 1 second or less and they have a maximum duration of **four years**
- Investments to **secure energy supply and infrastructure** reducing imbalances and disruptions
- **Time of use** and support to active consumers increasing their participation in the energy management
- **Stopping fossil fuels subsidies** will increase the uptake of Renewable Energy Sources

Energy Storage Market Overview

Figure 1: Global cumulative energy storage installations, 2015-30



Source: BloombergNEF. Note: MENA = Middle East & North Africa. Buffer represents markets and use-cases that we are unable to forecast due to lack of visibility.

Main takeaways

- ❖ Significant policy changes over last few years in EU energy sector → Energy storage outlook for the EU very strong
- ❖ Need to reward the benefits energy storage brings to the energy system e.g. with longer contracts, new ancillary services, ensure market based tendering ...
- ❖ India can benefit from the EU's regulatory and policy expertise in energy storage
- ❖ Deployment of energy storage is only possible through a comprehensive, fit-for-purpose regulatory framework
- ❖ Early energy storage systems deployment reduce overall costs



©Voith-Hydro - Frades II pumped storage station, Portugal.





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