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# Flexibility and the Italian electricity market's future

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# Agenda

- 1. Transition is happening and storage is a key enabler**
2. How to approach the rising storage business in the Italian power market?
3. Q&A



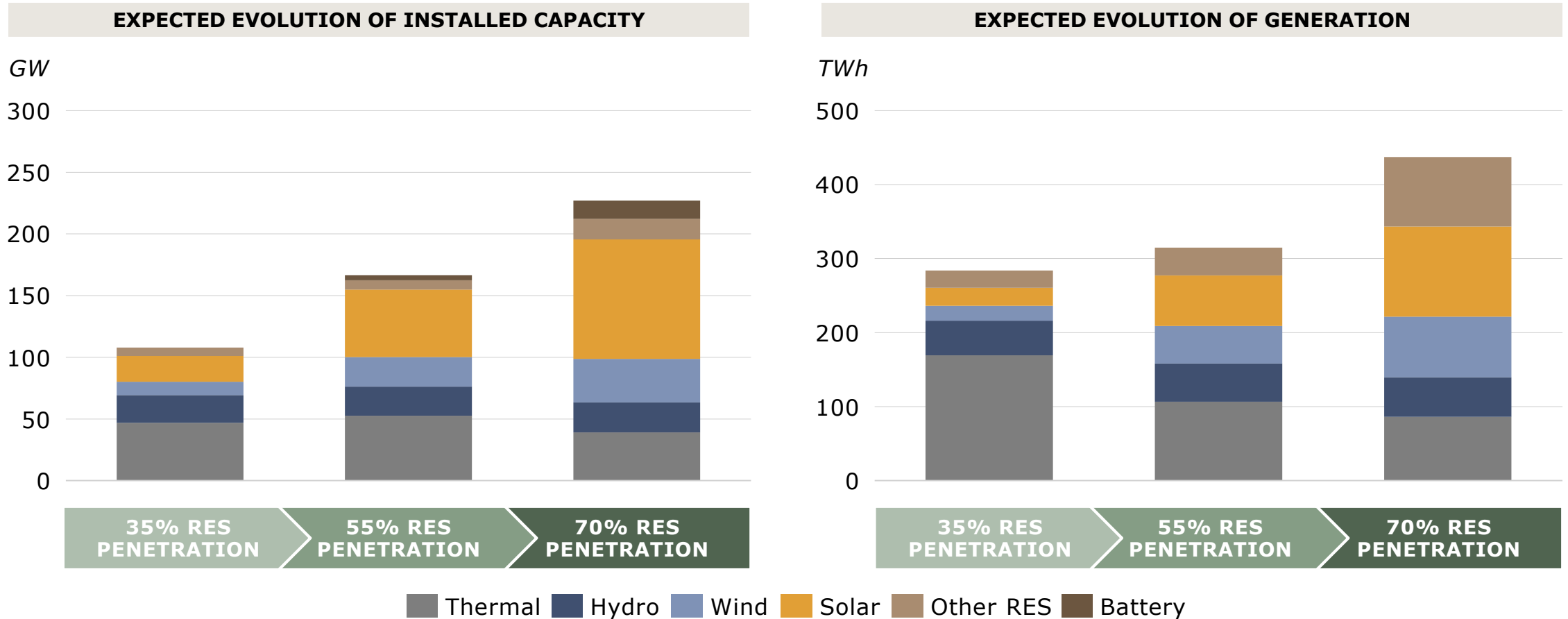
The electricity system is changing on a global scale, EU is pushing more and more on decarbonisation and electrification of consumption



Note: 1) Preliminary guidelines (document under consultation, published on 24<sup>th</sup> Nov. 2020)

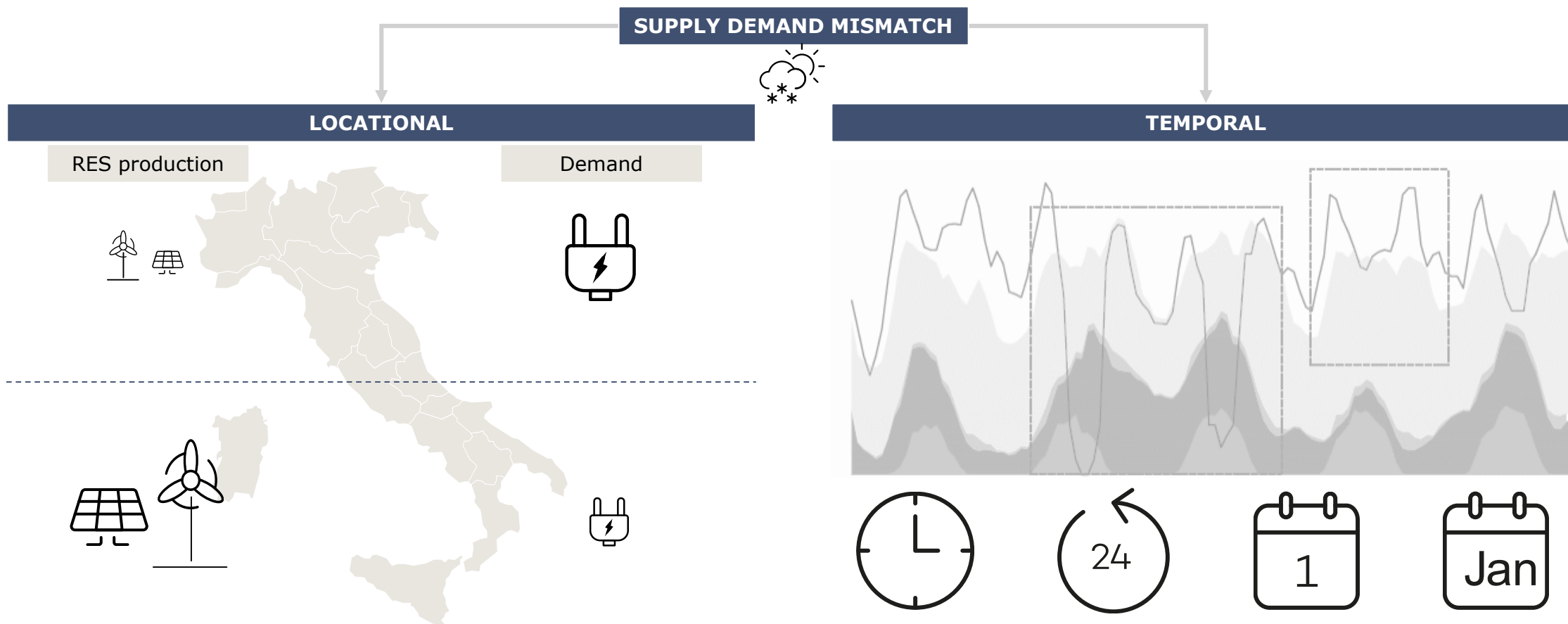
TRANSITION IS HAPPENING

Policy targets will lead to a massive deployment of RES generation, whose intermittency will need to be managed

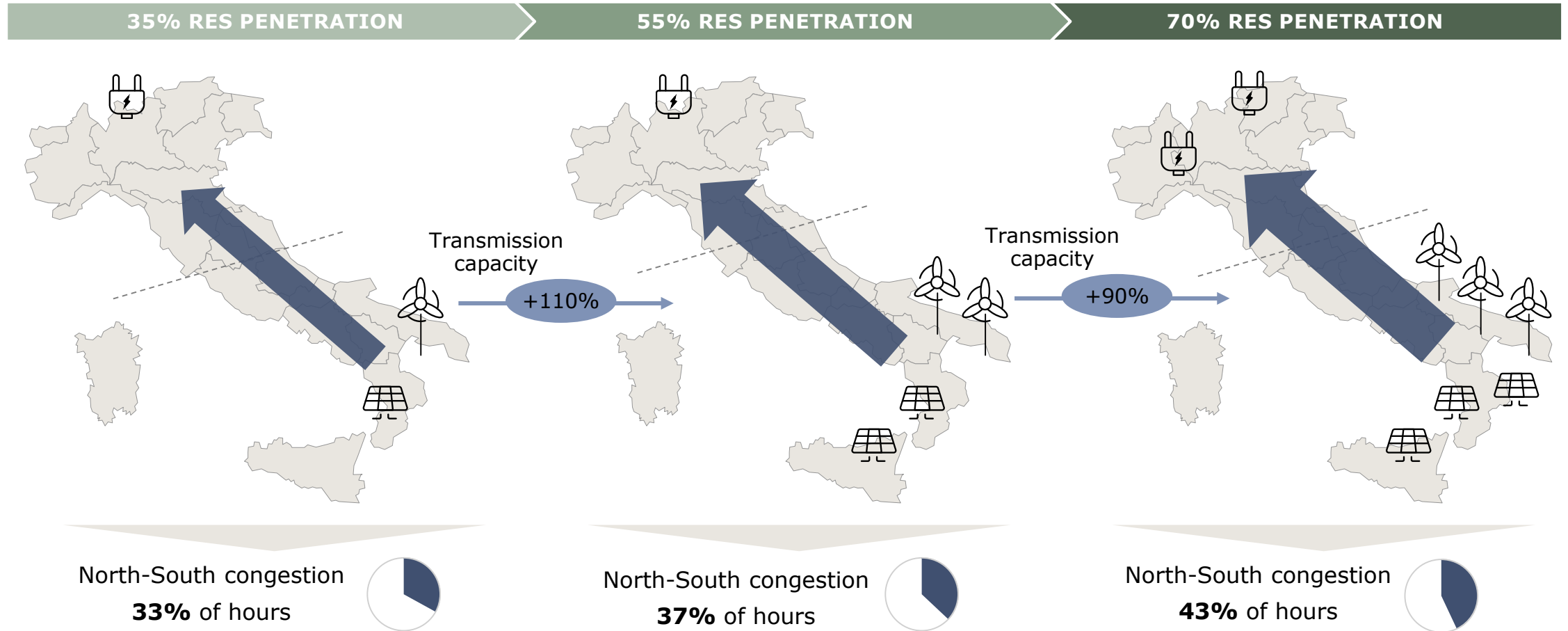


Source: AFRY Management Consulting

'Where' and 'When' electricity is produced and consumed is critical in an electricity system whose production is governed by the weather

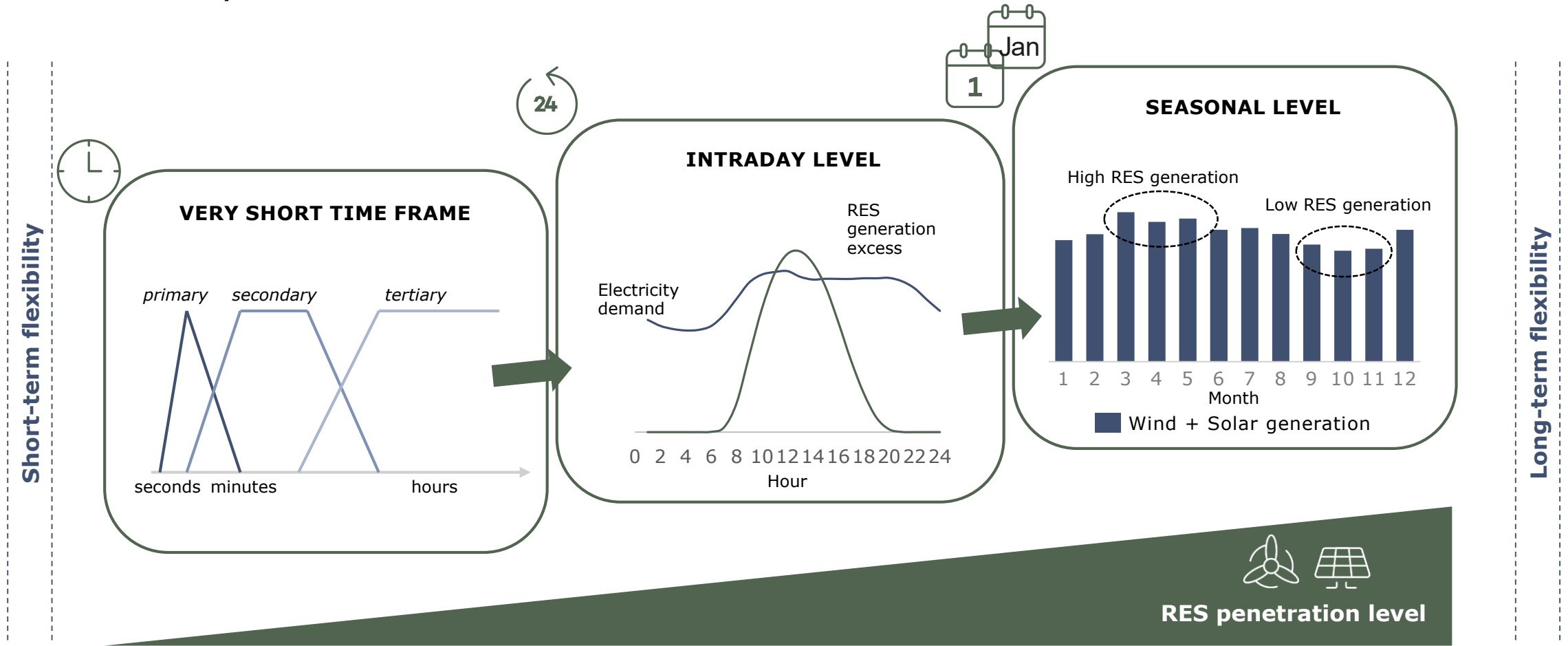


# Despite network improvements, the locational mismatch between demand and RES generation will continue to be an issue for the Italian system



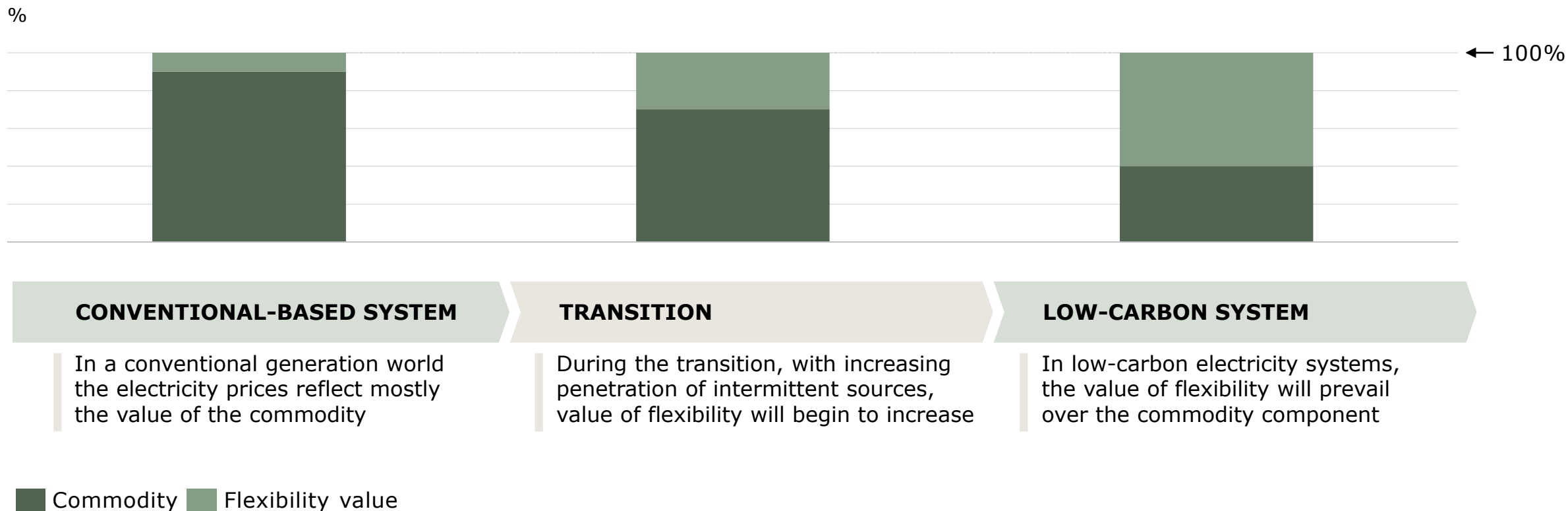
Source: AFRY Management Consulting

Flexibility will also become essential for allowing a safe management of the electrical system at different time frames



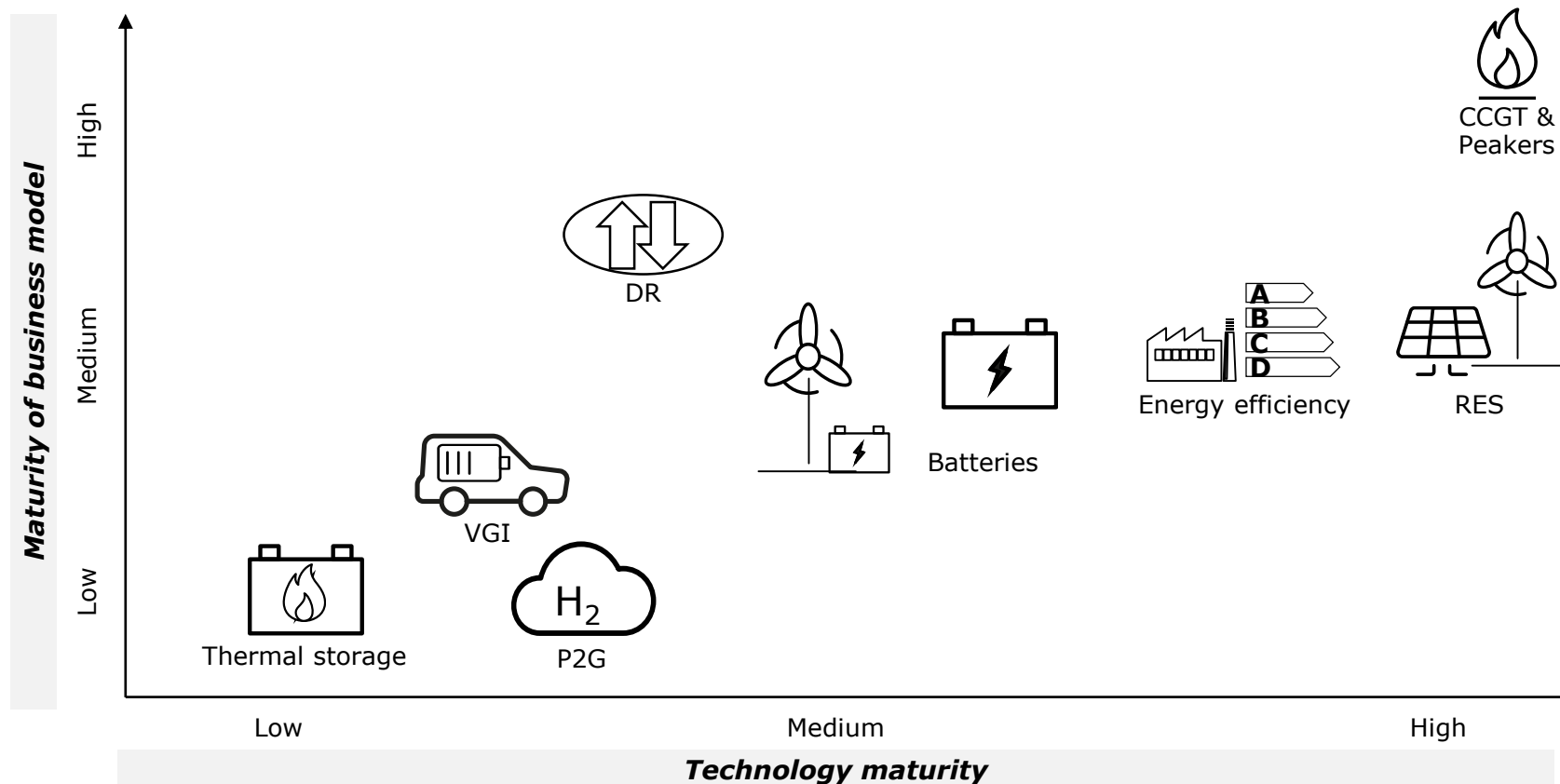
# In a RES dominated market the value of electricity will shift from generation towards flexibility

## ELECTRICITY PRICE COMPOSITION (ILLUSTRATIVE)



Notes: BESS – Battery Energy Storage System | DSR – Demand Side Response

Different sources of flexibility in various energy value chains will contribute, depending on maturity of both technologies and business models...

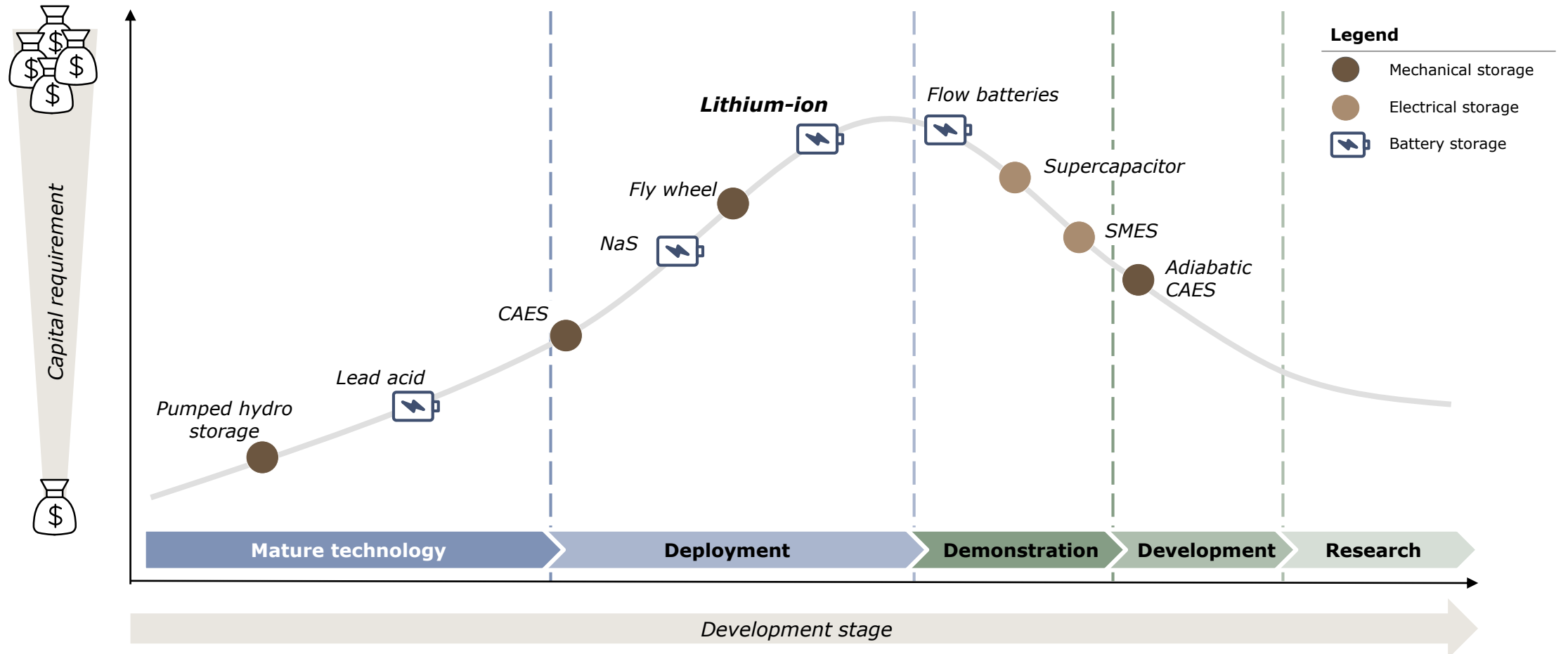


- Different new players will enter the market depending on technology maturity and business model attractiveness

- Flexibility can be provided by different services and technologies, mainly storage but also demand side response and electric vehicles

FLEXIBILITY PROVIDERS

... and in particular storage will be key provider of flexibility in the future Italian electricity system



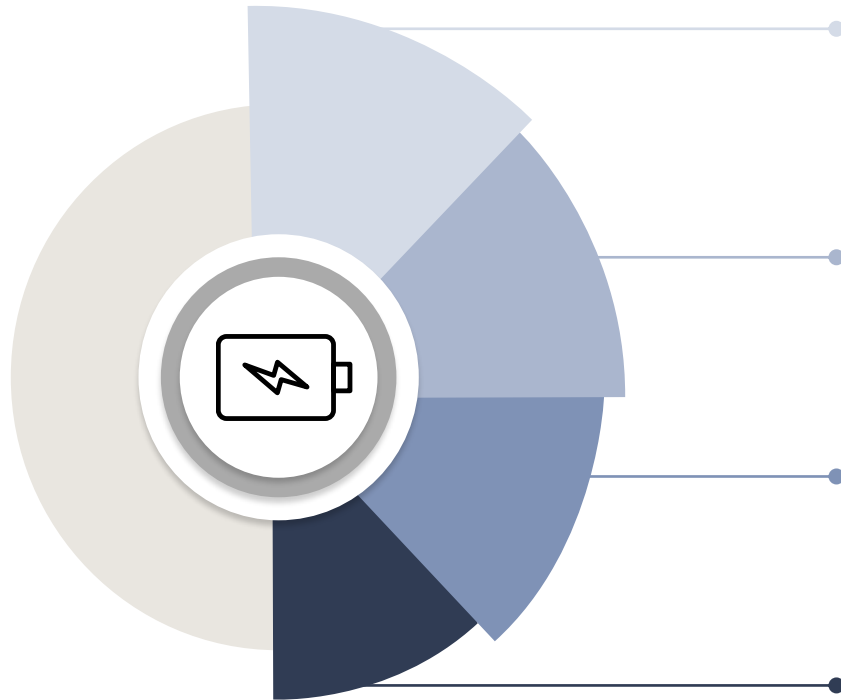
Notes: CAES – Compressed Air Energy Storage | SMES – Superconducting Magnetic Energy Storage | Source: AFRY analysis on public data

# Agenda

1. Transition is happening and storage is a key enabler
- 2. How to approach the rising storage business in the Italian power market?**
3. Q&A



# New opportunities are opening in the Italian market for storage development, but how to approach this new business?



## **WHICH BUSINESS MODEL?**

- Stand-alone?
- Co-located with RES?

## **WHERE?**

- Where is best to build new storage capacity?

## **WHEN?**

- Early mover?
- Which opportunities in future?

## **HOW BIG?**

- Which is the best energy capacity size?

WHICH BUSINESS MODEL?

Co-location can be beneficial in particular in terms of infrastructural synergies, but also barriers are in place



## SYNERGIES

### 1 **INFRASTRUCTURAL SYNERGIES**

Already existing infrastructures like connection can be exploited, implying a reduction in Capex

### 2 **IMBALANCE REDUCTION**

The presence of a battery may partially mitigate the imbalance costs of the wind farm

### 3 **CURTAILMENT REDUCTION**

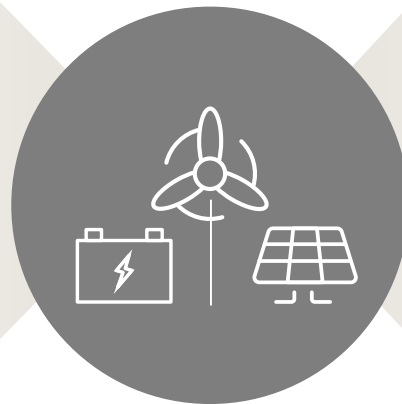
A battery could be useful to recover curtailed energy of the wind farm. However, the impact of curtailment could be already mitigated by the opening of the ancillary services market to renewable sources



## BARRIERS

### **CONFLICTING INCENTIVES**

Risk of potential conflict with some incentive schemes for renewables according to current regulation



## **BATTERY CO-LOCATION WITH RES**



WHERE?

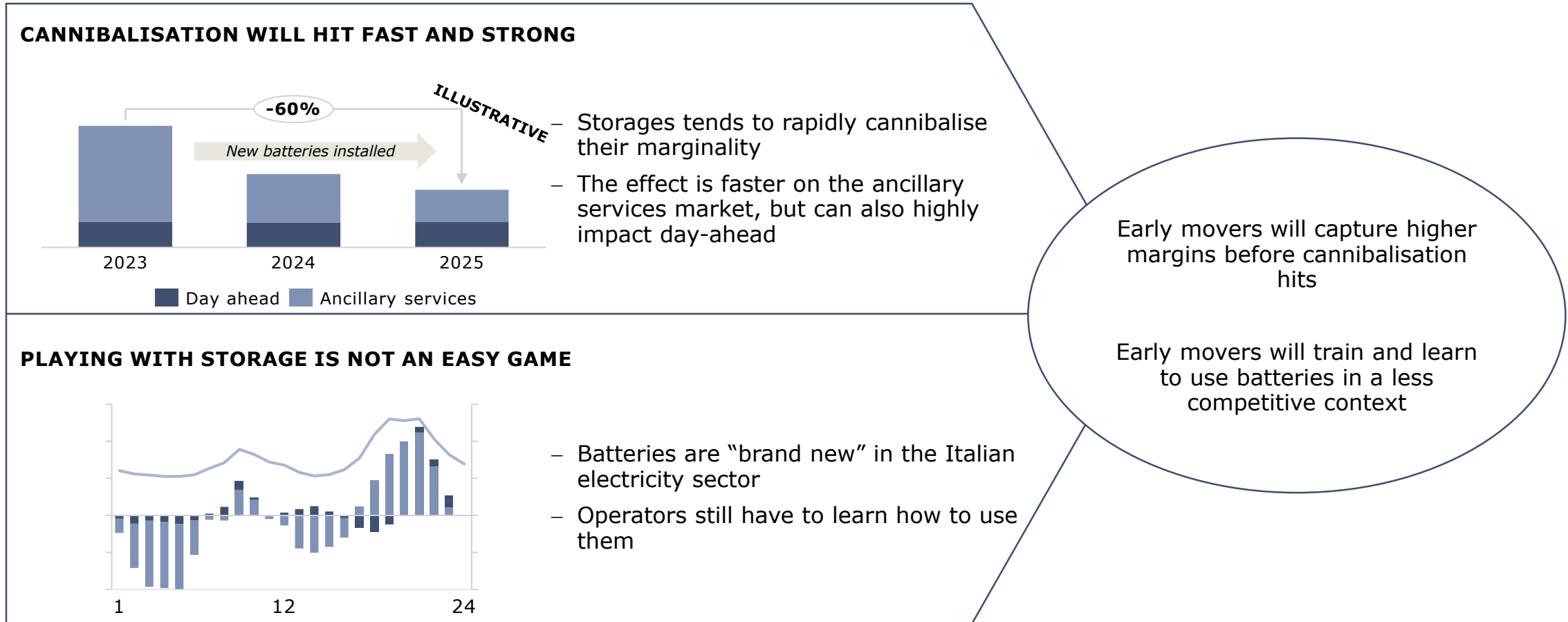
Each area has specific characteristics, but... is there enough space?



Note: Marginality from different markets is referred to 2h batteries

WHEN?

# Early movers will take advantage of higher market revenues, cannibalisation will hit fast and strong

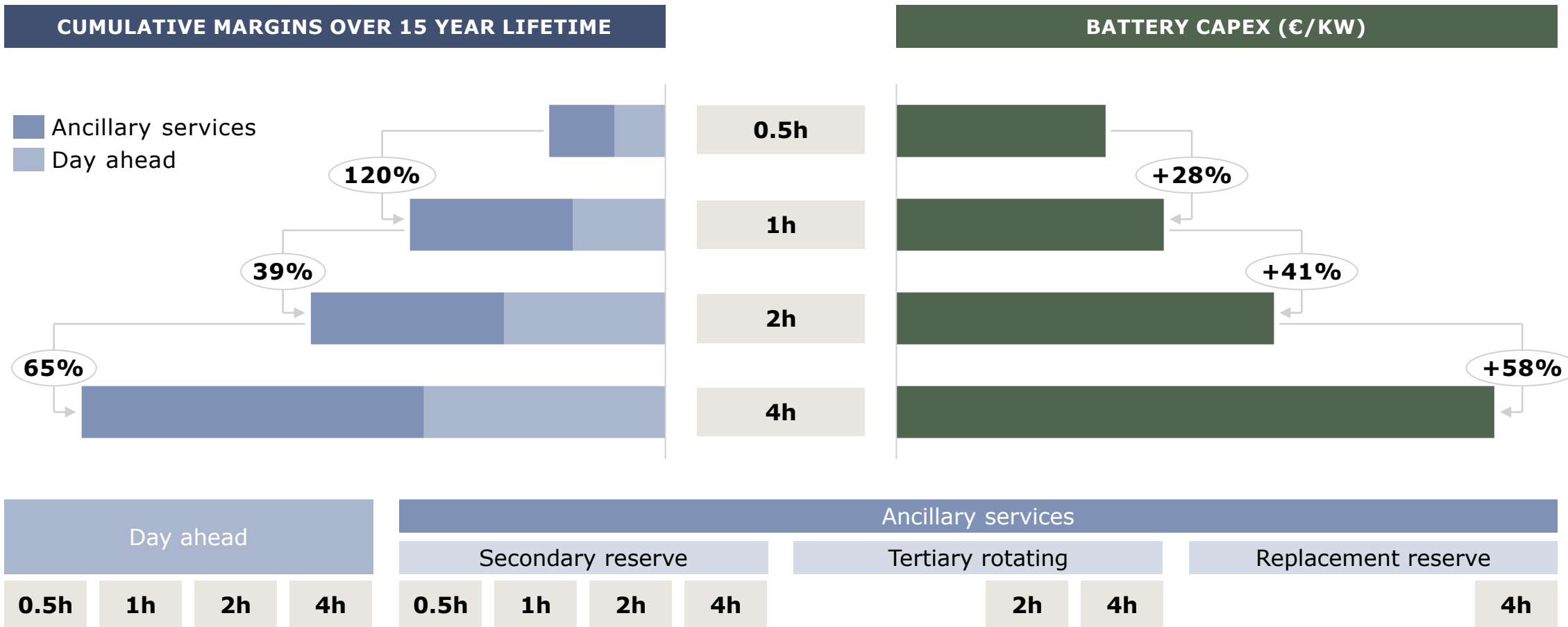


Note: Reported values are illustrative | Source: AFRY Management Consulting



HOW BIG?

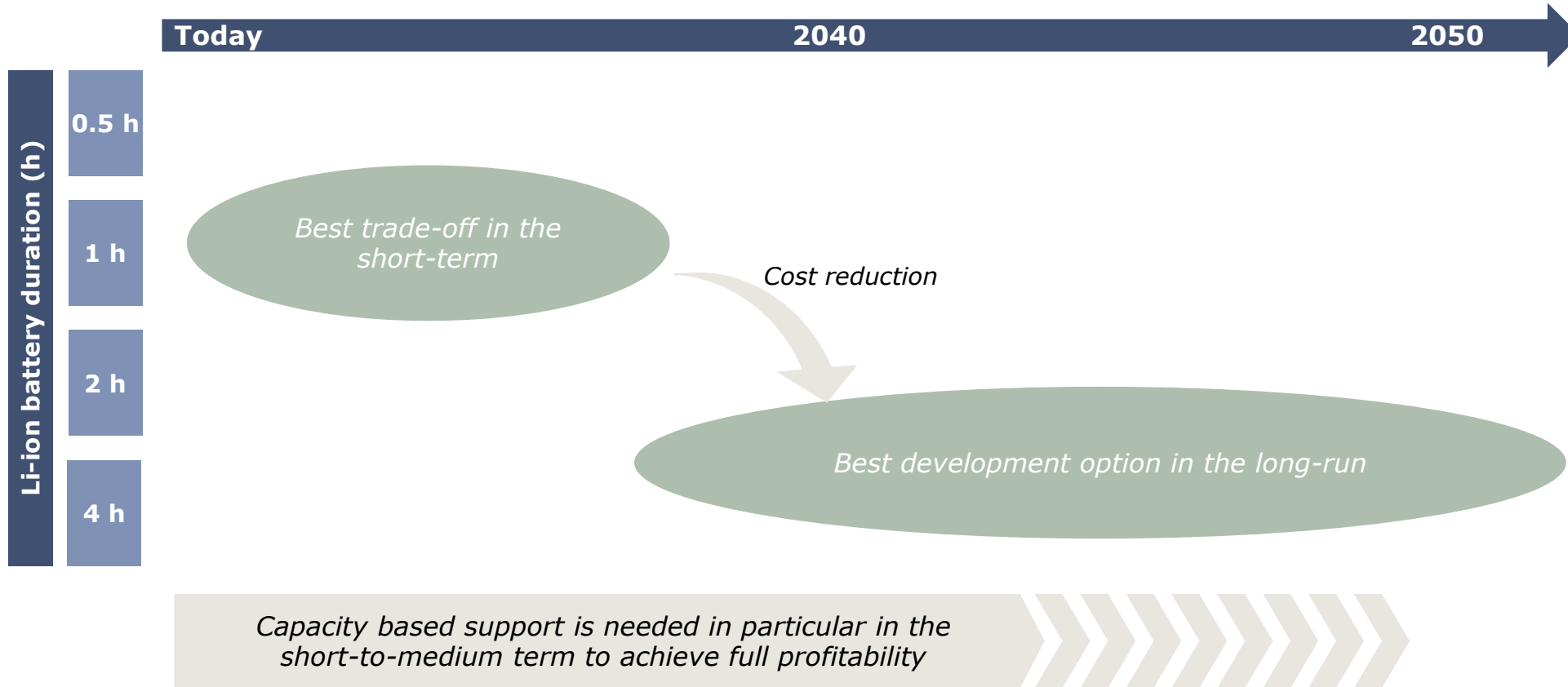
Sizing comes down to a trade-off between costs and revenues, as participation in most profitable services requires greater investments



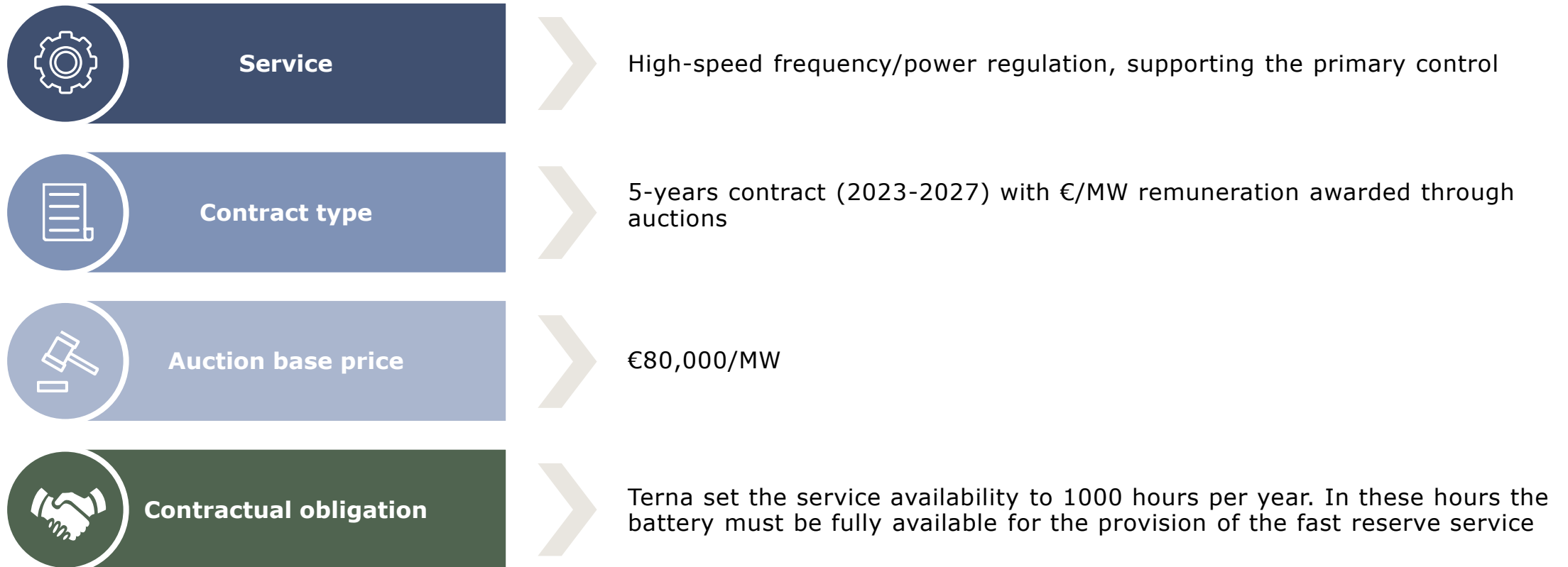
Note: Reported values are illustrative | Source: AFRY Management Consulting

HOW BIG?

With increasing RES penetration and decreasing cost of battery modules, higher duration batteries will ensure better profitability



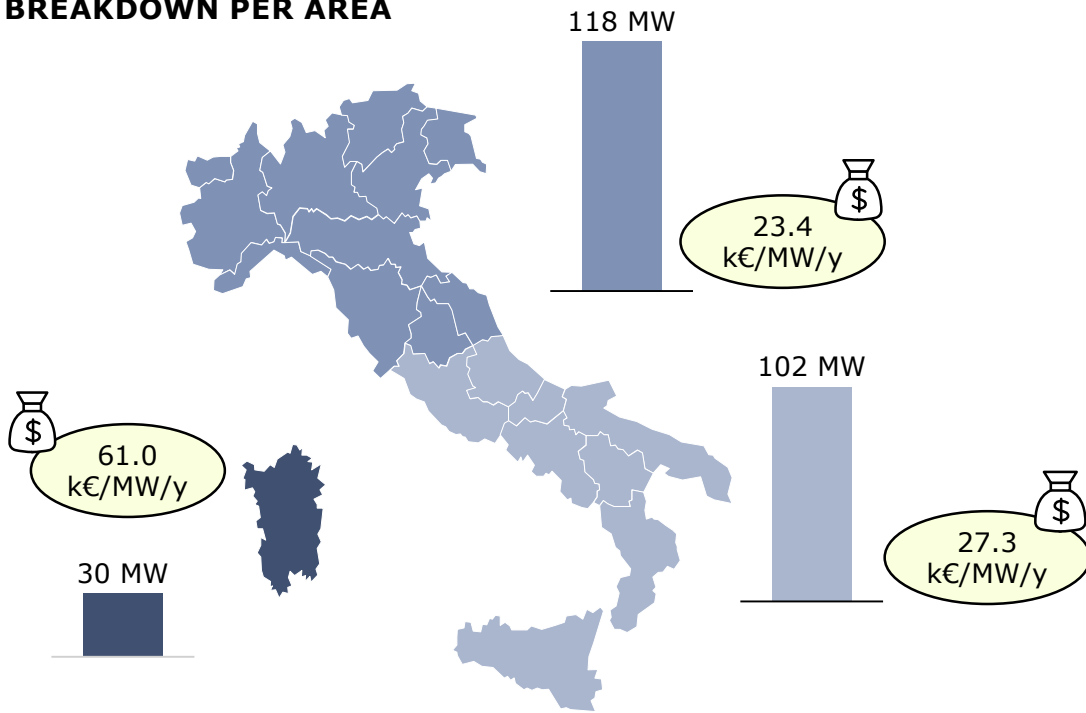
# Terna's "Fast reserve" project has been the first action to push the development of batteries in Italy...



... and the strong participation to the auctions is a clear signal that storage is seen as a very interesting opportunity

Capacity participating in auction: **1327.3 MW** → Assigned capacity: **249.9 MW**

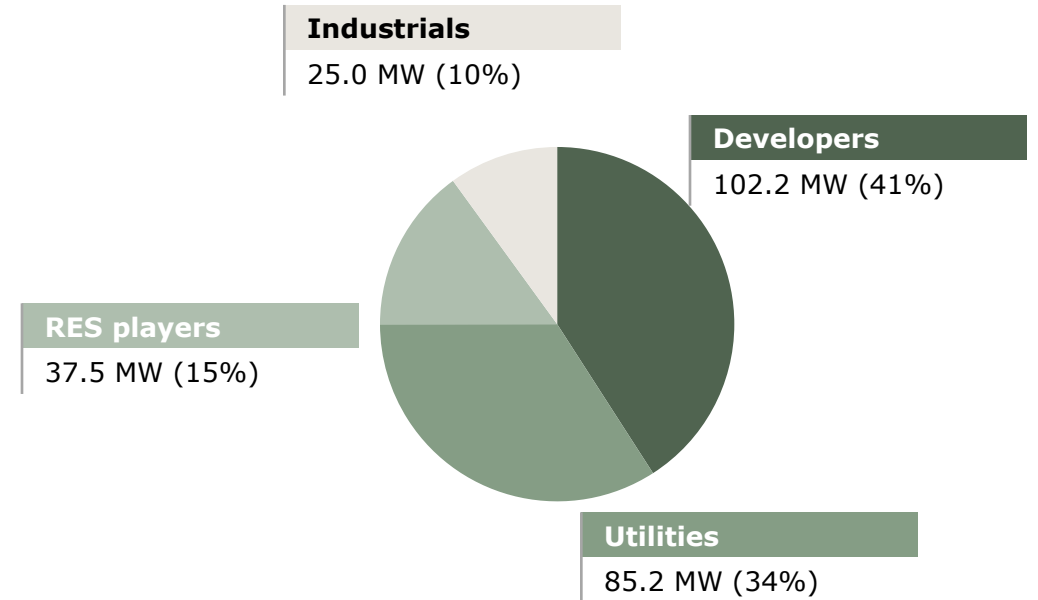
### BREAKDOWN PER AREA



#### Legend

- Assigned capacities (MW)
- Weighted average price (k€/MW/y)

### BREAKDOWN PER PLAYER TYPE



## To wrap up...

- 1** The path is set and the transition will happen anyway
- 2** Massive generation-demand mismatch, both geographically and timewise, will require flexibility in the system
- 3** Flexibility will be provided by a pool of different technologies, and storage is revealing to be a key player
- 4** New opportunities are opening for storage and will increase in the future, driven by system changes and cost reduction, but direct support will be needed in the shorter term
- 5** Strong interest in batteries has been confirmed by the very recent Fast Reserve auctions



CONCLUDING REMARKS

## Contact us

- **Reach out** to us for more information  
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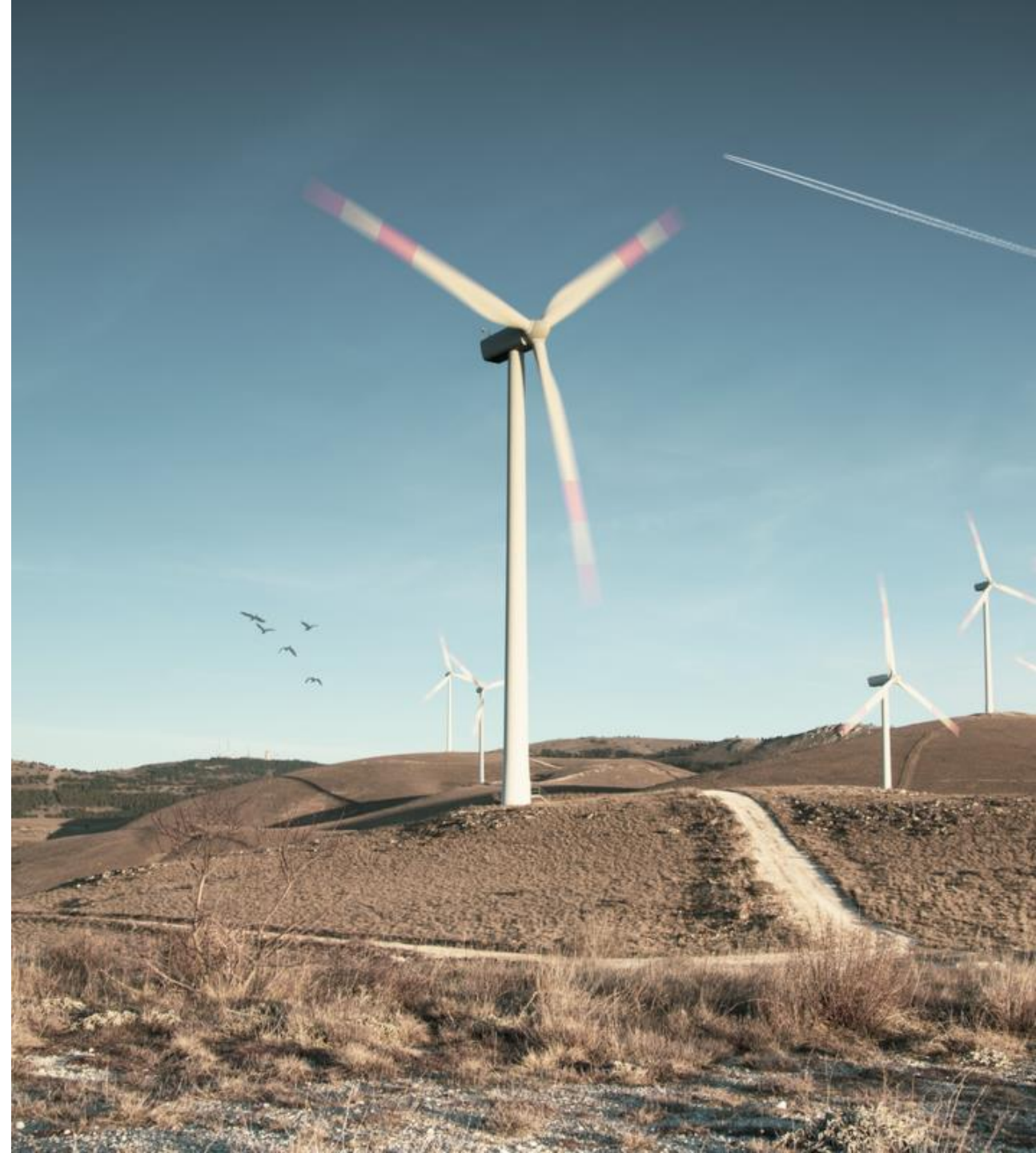
### **Fuelling the transition podcast:**

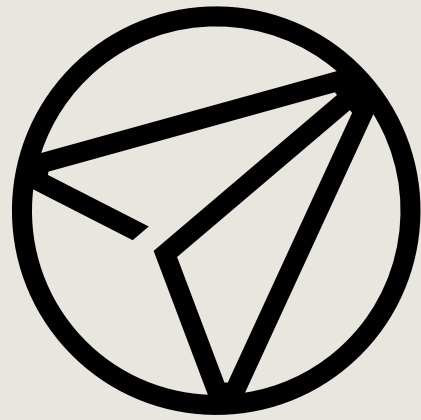
Episode 5 | Rethinking electricity markets with the Energy Systems Catapult

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