Adequacy Studies at ENTSO-E

Mid-term Adequacy Forecast & Seasonal Outlook

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Security of Supply Coordination Group 19th December Vienna

Programme

1. **Adequacy at ENTSO-E**
2. **MAF 2018:** methodology & outcomes
3. **Seasonal Outlook:** methodology and outcomes

Different risks addressed with different timeframes

Long term

>10 years

Mid term

Several years

Short term

Several months **1 week**

Policy decisions

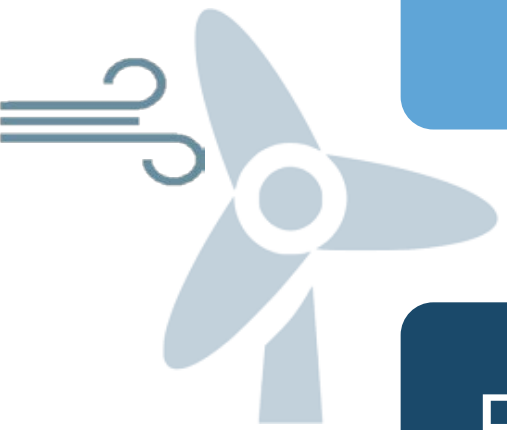
Investment decisions

Operational decisions

REAL TIME

UNCERTAINTY INCREASES

Energy transition requires a robust methodology



High ***temporal*** volatility

Probabilistic (hourly)

High ***spatial*** volatility

Interconnections (Pan European)

MAF 2018 methodology and main outcomes

Resource Adequacy: General Methodology

Storage

Available Generation | **Network Infrastructure** | **Demand**

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Deterministic Forecast:
- ENTSOs' Scenarios
- Planned Outages

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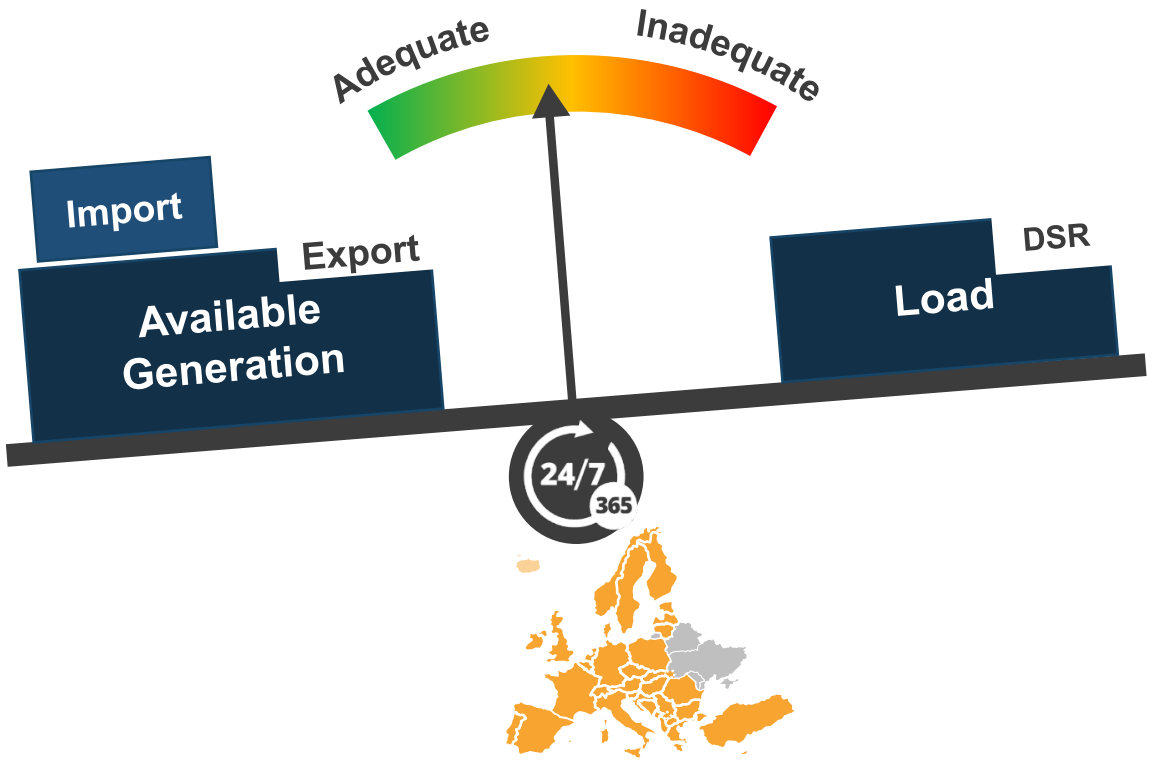
Uncertainty:
- Wind generation
- Solar generation
- Forced outages



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Deterministic Forecast:
- ENTSOs' Scenarios

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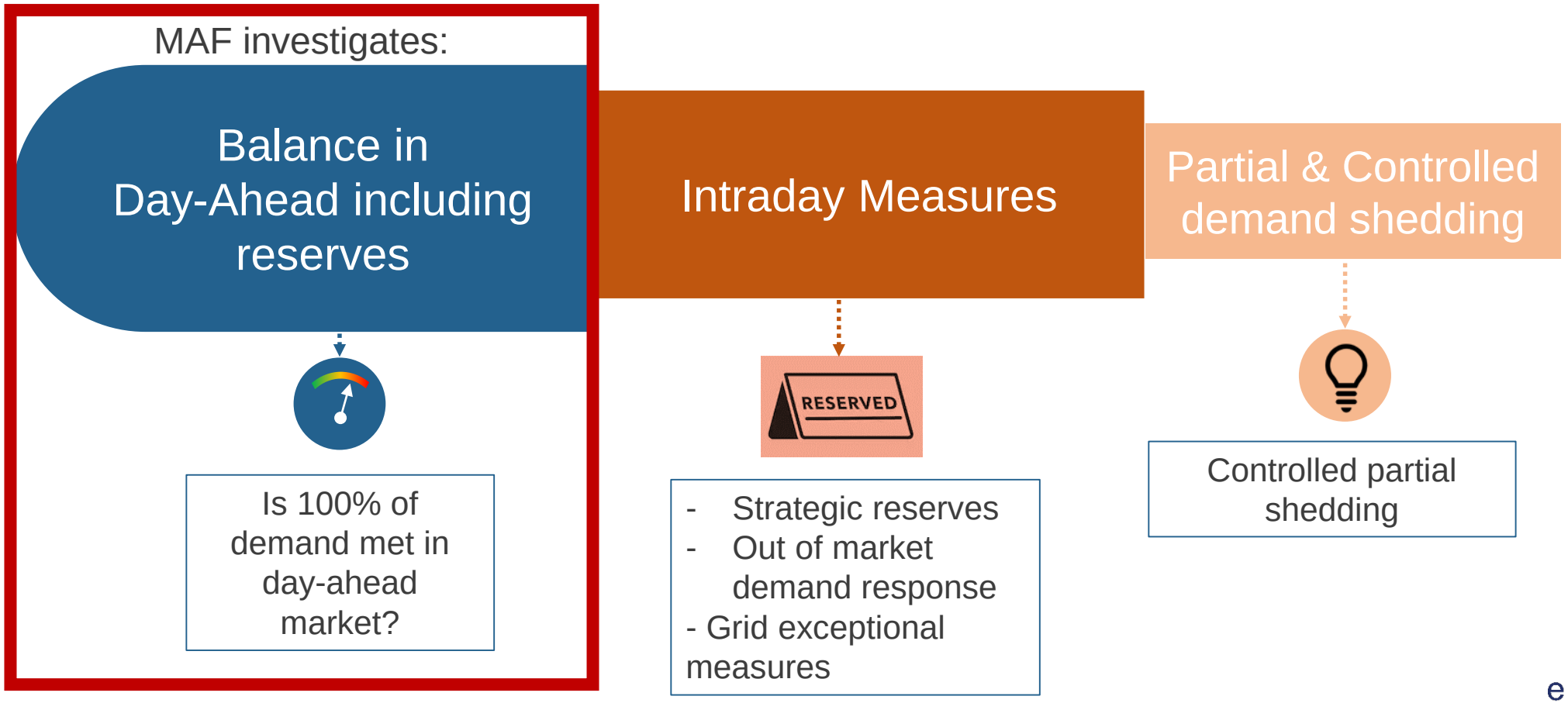
Uncertainty:
Temperature

Loss of Load Expectation is not a blackout

LOLE (h) indicates inadequacy risks looking at the day-ahead market (intraday and out-of-market resources and measures not considered).



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MAF 2018 scope and limitations

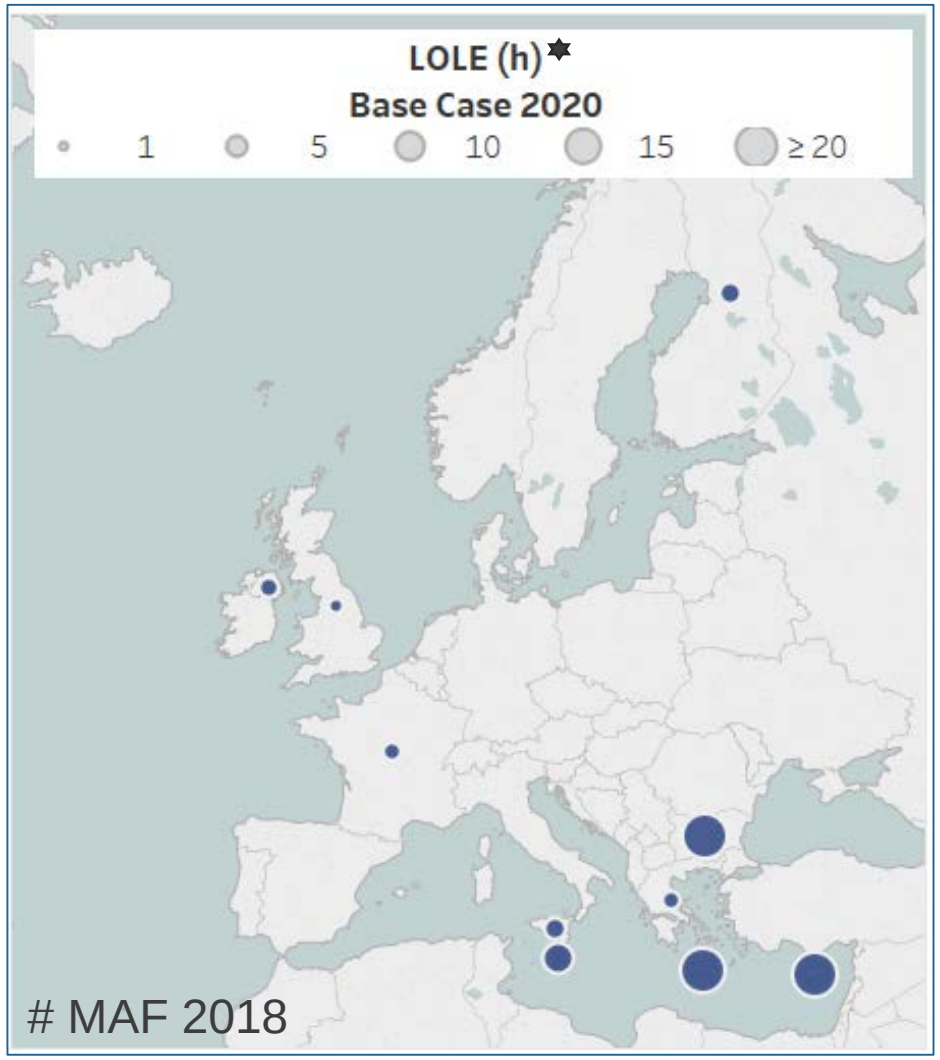
Addressed by MAF

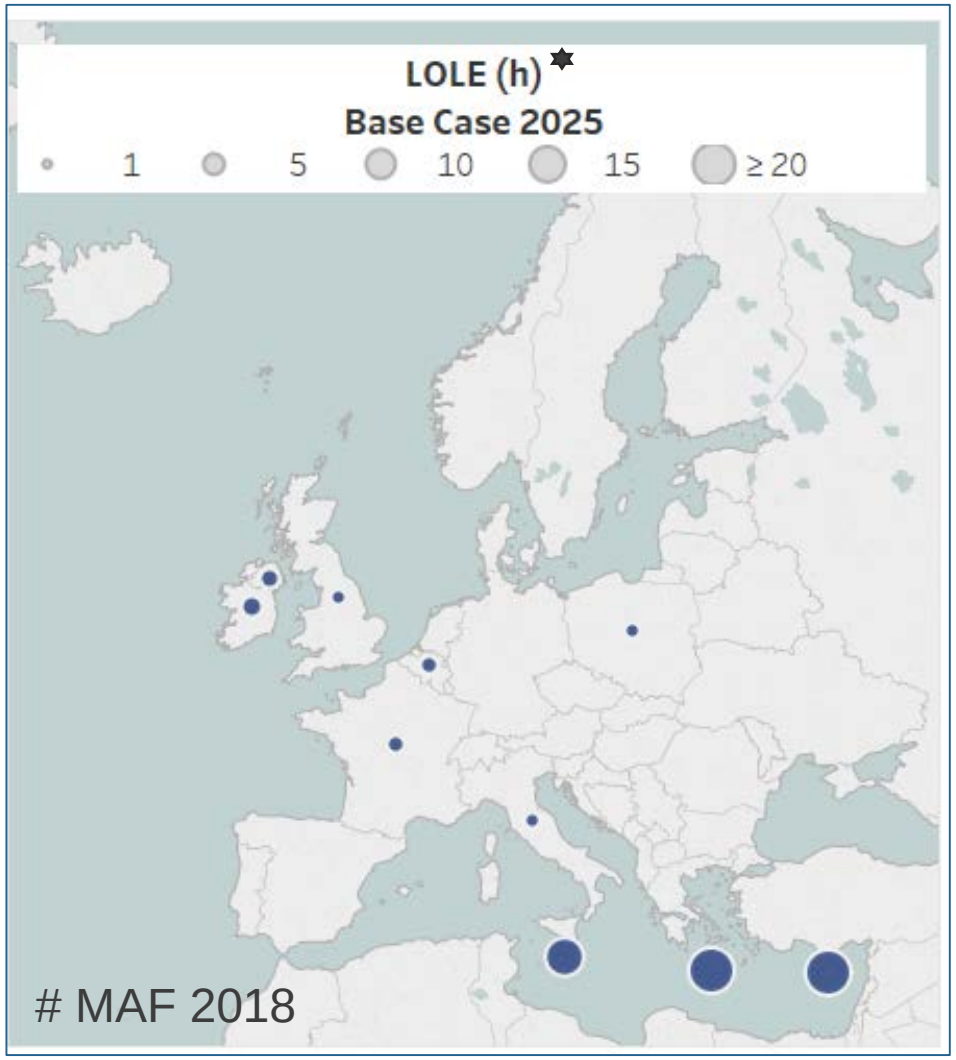
- ☑ Identification & quantification of **resource scarcity risk** in day-ahead market in 2020 and 2025
- ☑ **Accelerated low-carbon** sensitivity analysis for 2025
- ☑ Single or multiple areas with **scarcity and contribution of interconnections**

Not addressed by MAF

- ☐ **Economic viability** of power plant units and risk of decommissioning
- ☐ Suitability of **regulatory framework** & **market design** (e.g. rightness of Capacity Mechanism)
- ☐ **Internal congestion** within a Bidding Zone (considered as copper plate)

Base case results: Comparison of year 2020 and 2025

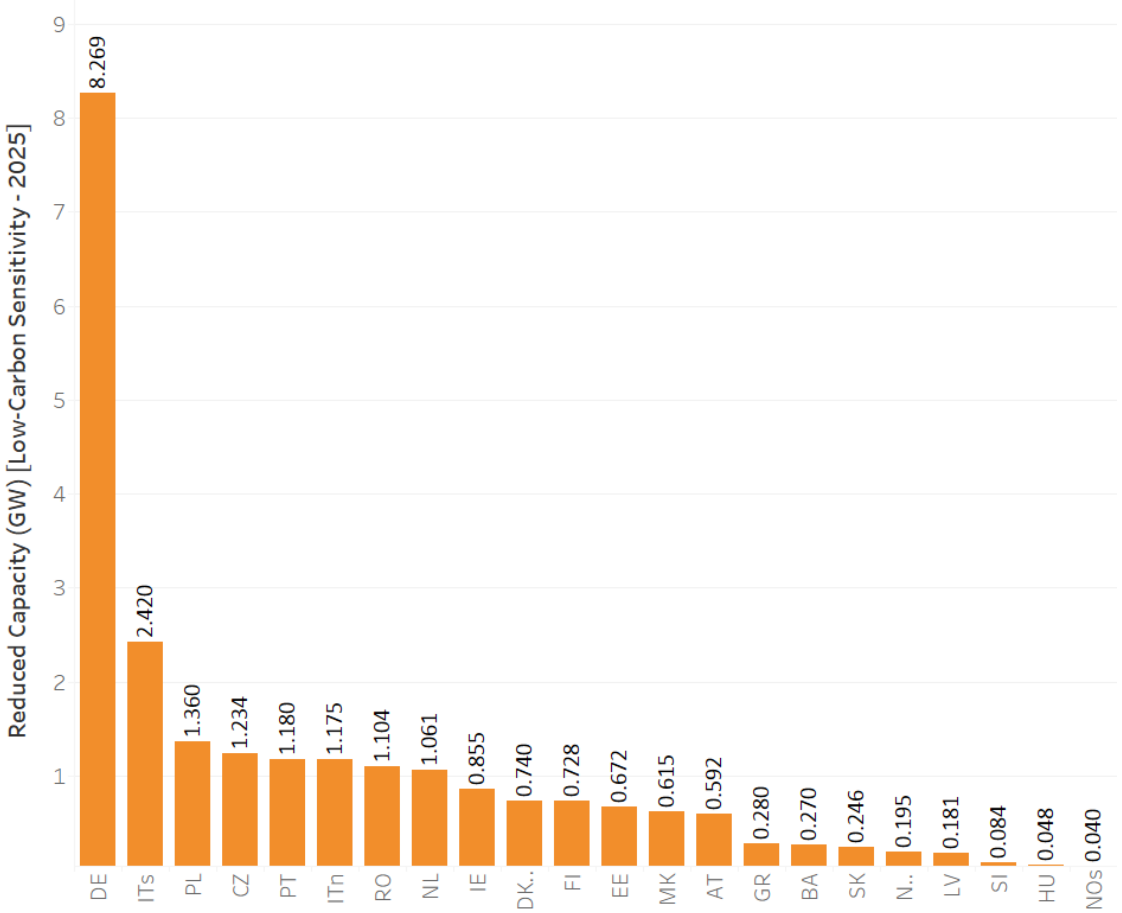


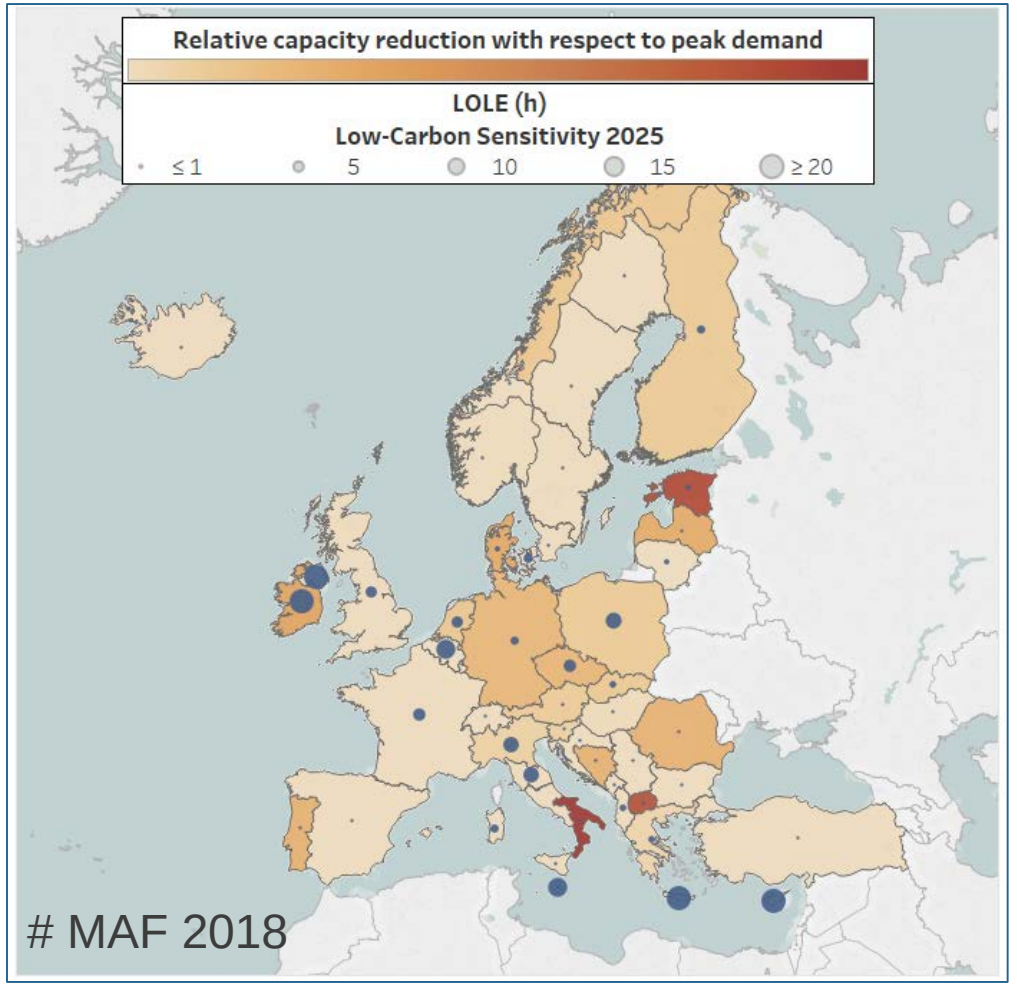


By 2025 adequacy gets tighter, but LOLE remains **below national thresholds in most zones**

* *Loss of Load Expectation (LOLE) is the expected number of hours per year with adequacy risk*

Low-Carbon stress test for 2025: 23 GW phased out



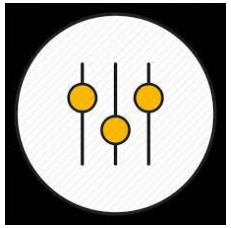


Need to adjust the resource mix in case an “accelerated carbon phase–out” takes place

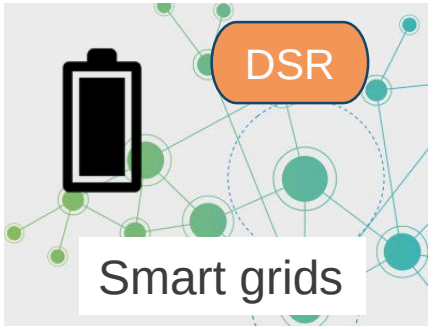
MAF 2018 key take-aways

Improved adequacy results compared to MAF 2017 → **Key monitoring role of MAF**

Low-carbon sensitivity analysis → **Need to adjust the resource mix**



MAF methodology becoming a reference in Europe → **Complementary regional/national studies to investigate specific solutions**



Seasonal Outlook

Seasonal Outlooks- Stepwise approach

Inputs from TSOs and pan-European databases

European constraining scenarios

synchronous peak (upward) → Wednesdays 7 pm

low demand with high RES (downward) → Sundays 5 am and 11 am

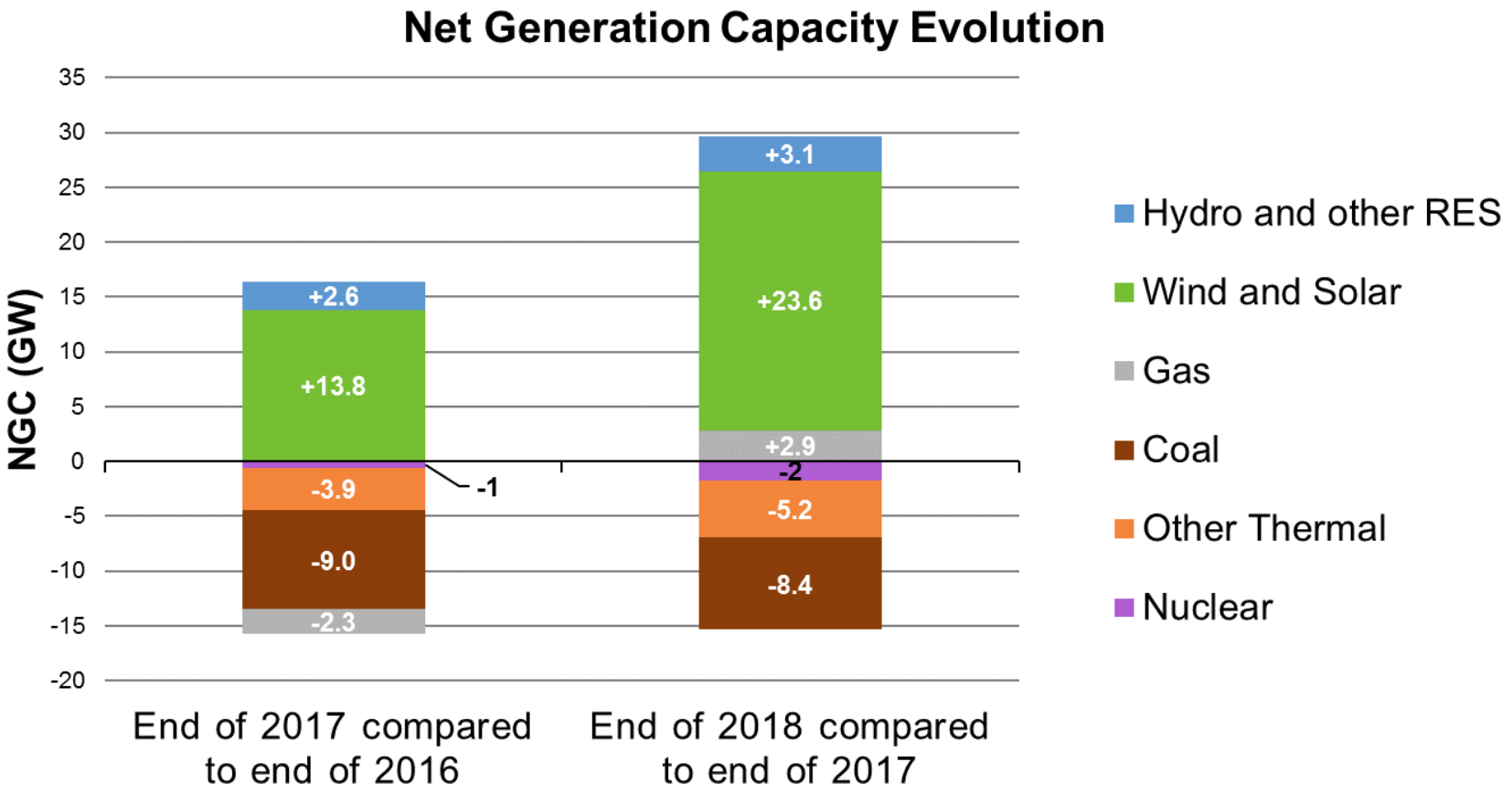
Focused analysis on weeks flagged at risk

Probabilistic approach using numerous situations (temperature, wind...)

Aim is to estimate the probability that an issue could occur

Main drivers are identified

Evolution of Europe's generation mix



Gas power plant capacity has increased after a fall recorded last winter

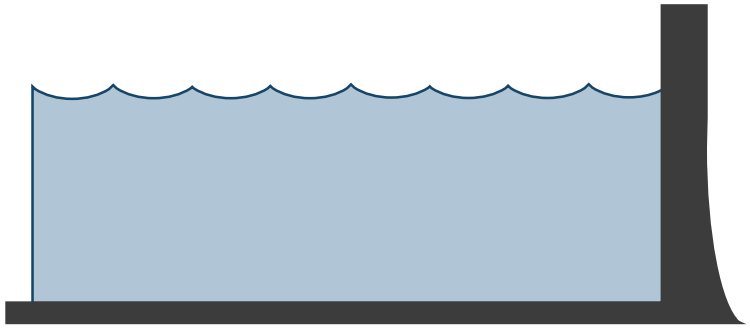
Acceleration of new RES installation

Winter Outlook Context

Unforeseen maintenance and delays together with countermeasures are considered.

Nuclear unavailability

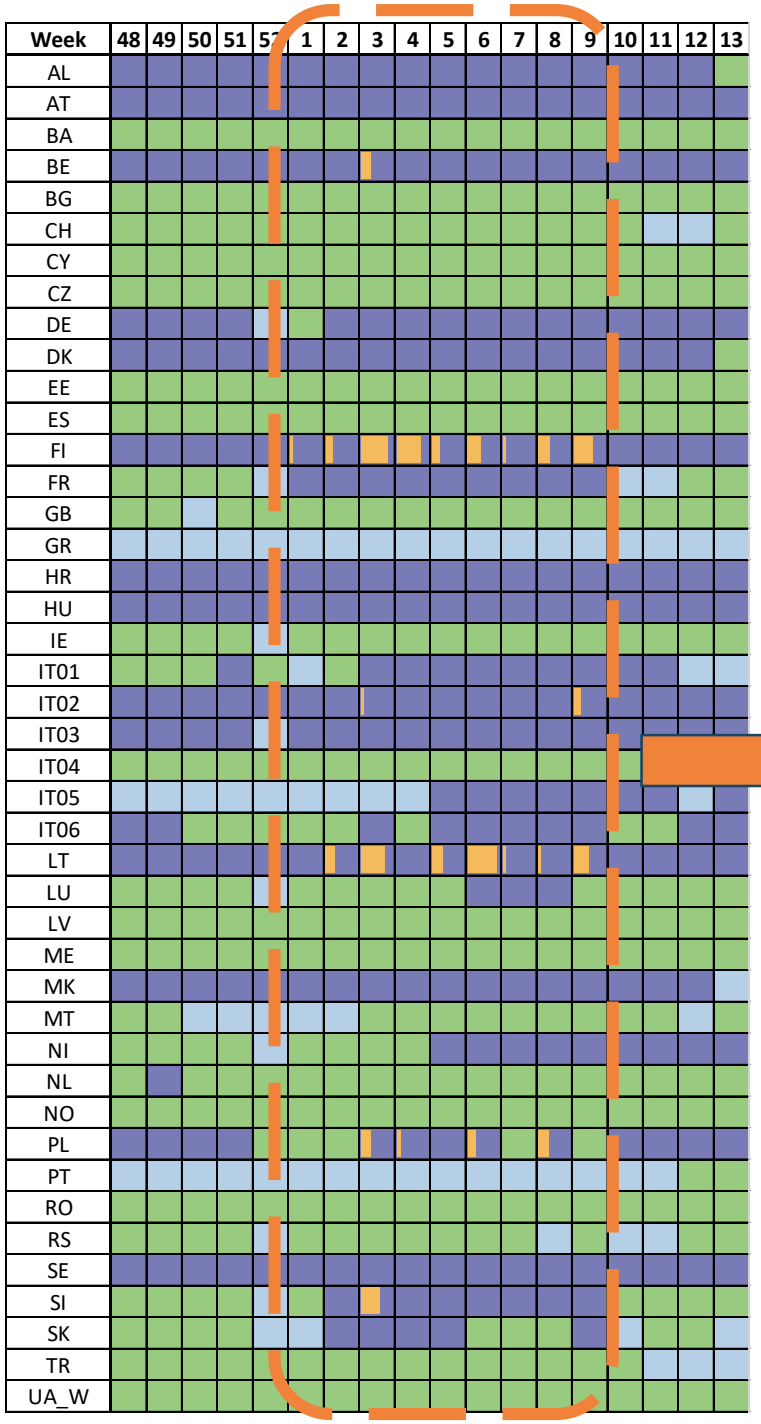
Countermeasures



Hydro reservoir levels near average in Europe

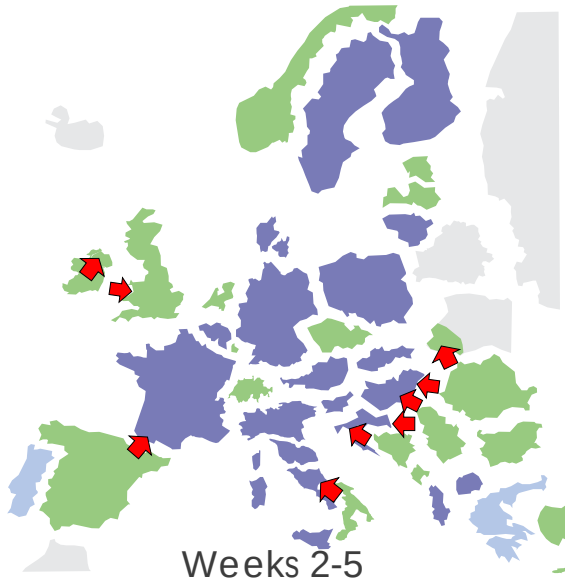
But low river levels in south Germany

Winter Outlook- Severe Conditions



Adequacy at pan-European synchronous peak demand time

Out of market measures excluded



Regional cooperation is a key – potential need for out of market measures

- Country self-sufficient and prone to export from market perspective
- Country self-sufficient but prone to import from market perspective
- Country required to import from an adequacy perspective
- Part of deficit cannot be convered with imports

THANK YOU
FOR YOUR ATTENTION!