

The background is a dark blue globe showing the continents of Europe and Africa. Overlaid on the globe are numerous glowing blue lines that represent energy transmission paths, connecting various points across the landmasses.

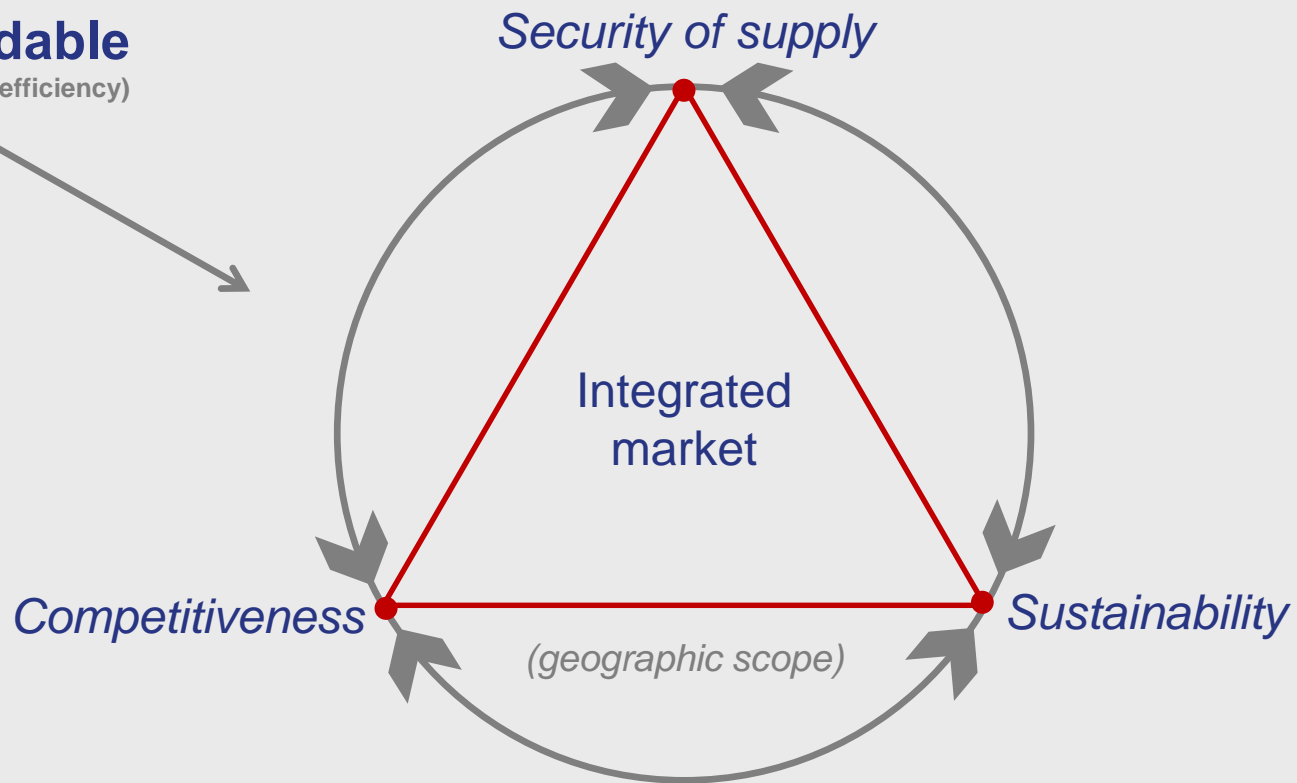
# *Assessing adequacy in WB6*

Arben Kllokoqi


Electricity Expert

# The end is for what we start

**... and affordable**  
(coming from greater market efficiency)



# TA on Adequacy assessment on WB6

- Early this year ECS launched a TA project on Adequacy Assessment and Capacity Mechanisms
- Aim:
  - Assessing potential issues with SoS (Task 1)
  - Designing means to address them through market and potential capacity supportive mechanisms (Task 2)
- Consultant: The logos for FTI Consulting and Compass Lexecon are displayed above the word "ENERGY" which is underlined.

E N E R G Y
- Assessment of existing development plans; adequacy reports; fundamental data, interview with TSOs
- Preliminary results available ... slides developed by Consultant!

# Adequacy assessment – geographic scope



**WB6 countries:** Detailed modelling on a plant-by-plant basis

**Countries interconnected with WB6 countries:** Aggregated modelling on a technology level

**Other countries:** Not modelled (only the import/export volumes with the "blue countries" are considered, based on historical data)

1

Define security of supply by setting target indicators

- The security of supply target is usually defined as **Loss of Load Expectation (LOLE)** or **Energy not served (ENS)**
- For example, **LOLE target of 3 hours** per year in France and the UK set by law.

2

Forward adequacy modelling in order to identify whether there is a need for intervention

Adequacy model

- Whether the **installed capacity expected** in the future would be necessary to ensure the achievement of the **security of supply targets**
- Account for **expected market developments** and the likelihood for power plants to stay online / retire / be added to the system
- The model runs in **several scenarios of installed capacities** corresponding to potential retirements and additions

Market model

- Combined with adequacy model for the analysis of **market outcomes and generation mix**
- **Incentives for capacity generation, market entry or exit** in presence or in the absence of the CRM
- Key to understand the **likely revenues of power plants** in absence of any intervention.

## Assumption for scenario definition

- i. Wholesale power market reforms;
- ii. Market coupling within and with neighbouring EU MSs
- iii. 2030 RES developments,
- iv. Impact of LCPD
- v. CO2 price

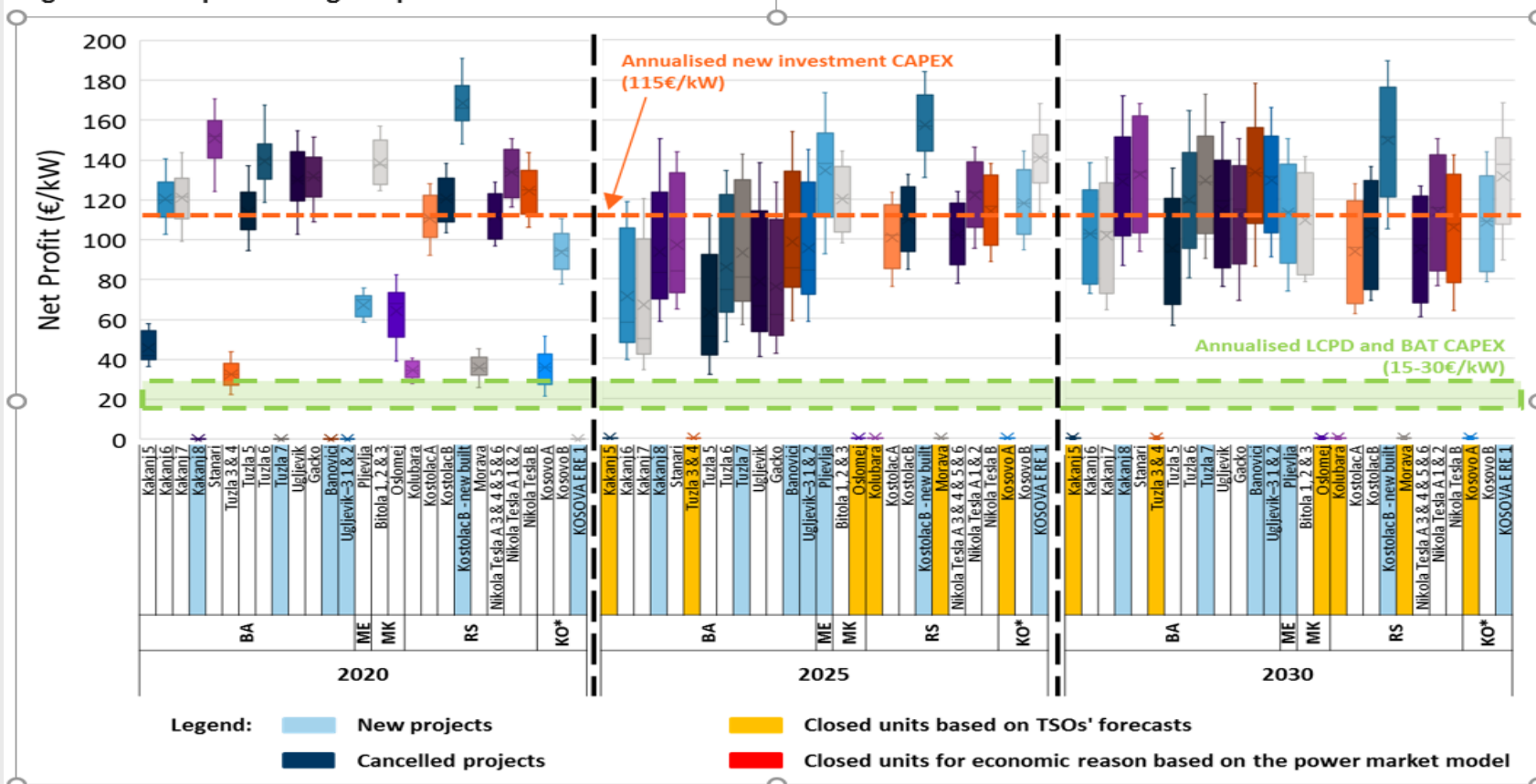


1. **Base Case Scenario** – (i), (ii), (iii) + LCPD + Capacity forecast based on TSOs Base Case
2. **Energy Only Market (EOM) EU ETS 2030 Scenario** - Base Case + Economic investment and shutdown decisions + EU ETS from 2030 onwards
3. **Energy Only Market EU ETS 2025 Scenario** - Base Case + Economic investment and shutdown decisions + EU ETS from 2025 onwards
4. Assessment of CO2 price/costs - **loading**

- (i) power supply (e.g. generation capacity and demand side response),
- (ii) power demand (including reserves),
- (iii) cross-border interconnection capacity,
- (iv) commodities including gas, coal, oil, CO<sub>2</sub>, and
- (v) cost
- Economic analyses based on energy-only market (bidding based on SRMC)
  - $Net\ profit = Energy\ revenues + Ancillary\ services\ revenues - Variable\ Generation\ costs - Fixed\ O\&M\ costs$
- Net profit is compared with annualized CAPEX

Technology	Investment costs			Refurbishment costs (LCPD and BAT standard)		
	Amortization period (years)	Annualised costs for 2020 (€/kW)	Annualised costs for 2030 (€/kW)	Amortization period (years)	Annualised costs for 2020 (€/kW)	Annualised costs for 2030 (€/kW)
Coal	35	115		10	15-30	
CCGT	30	65		/	/	/
OCGT	25	45		/	/	/
Battery	10	140	80	/	/	/
Long term storage	20	125	80	/	/	/

Figure 15: Net profit of lignite plants in the base case scenario





# Market model results

Figure 17: Net profit of lignite plants in the EU ETS 2025 EOM scenario

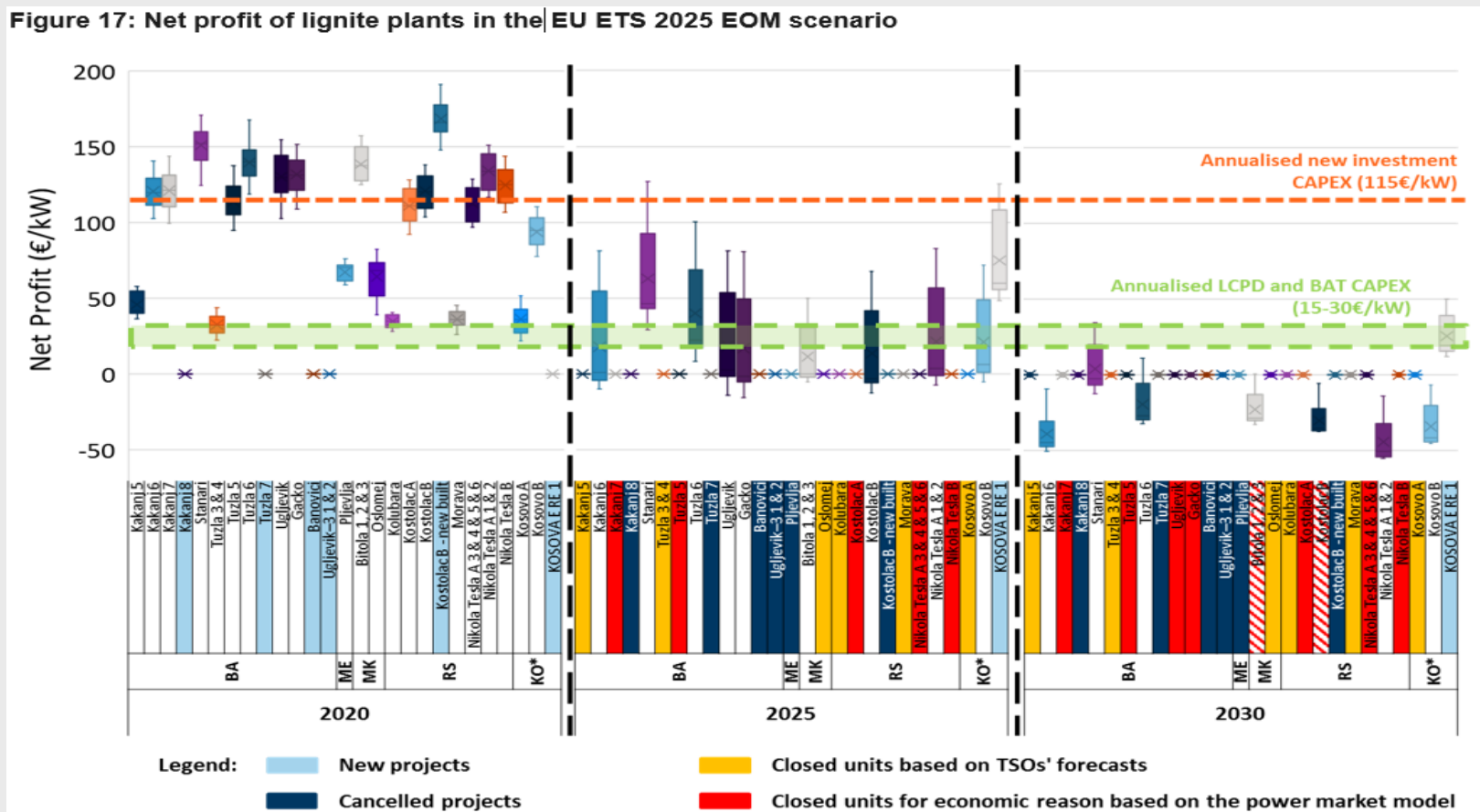
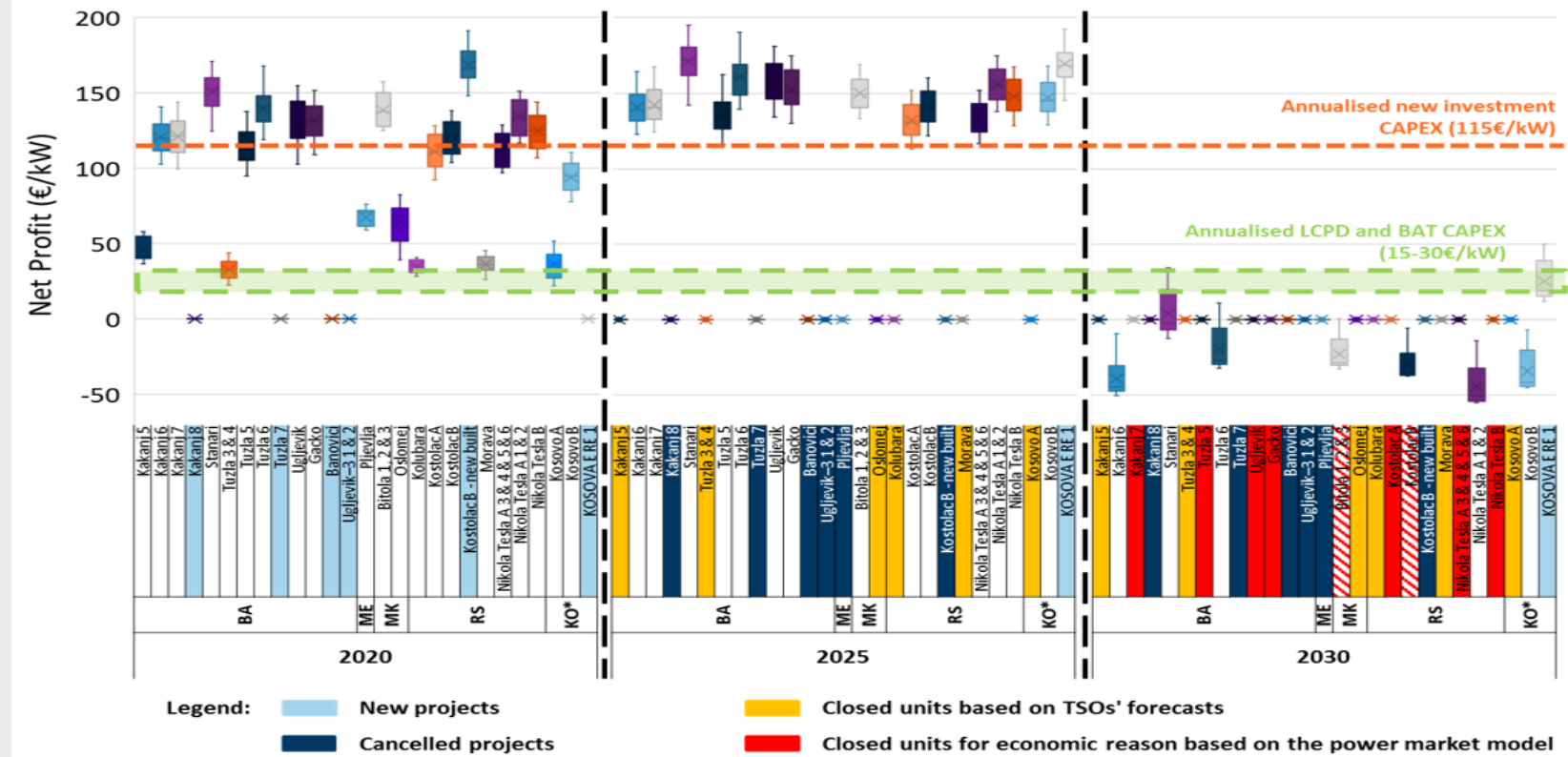
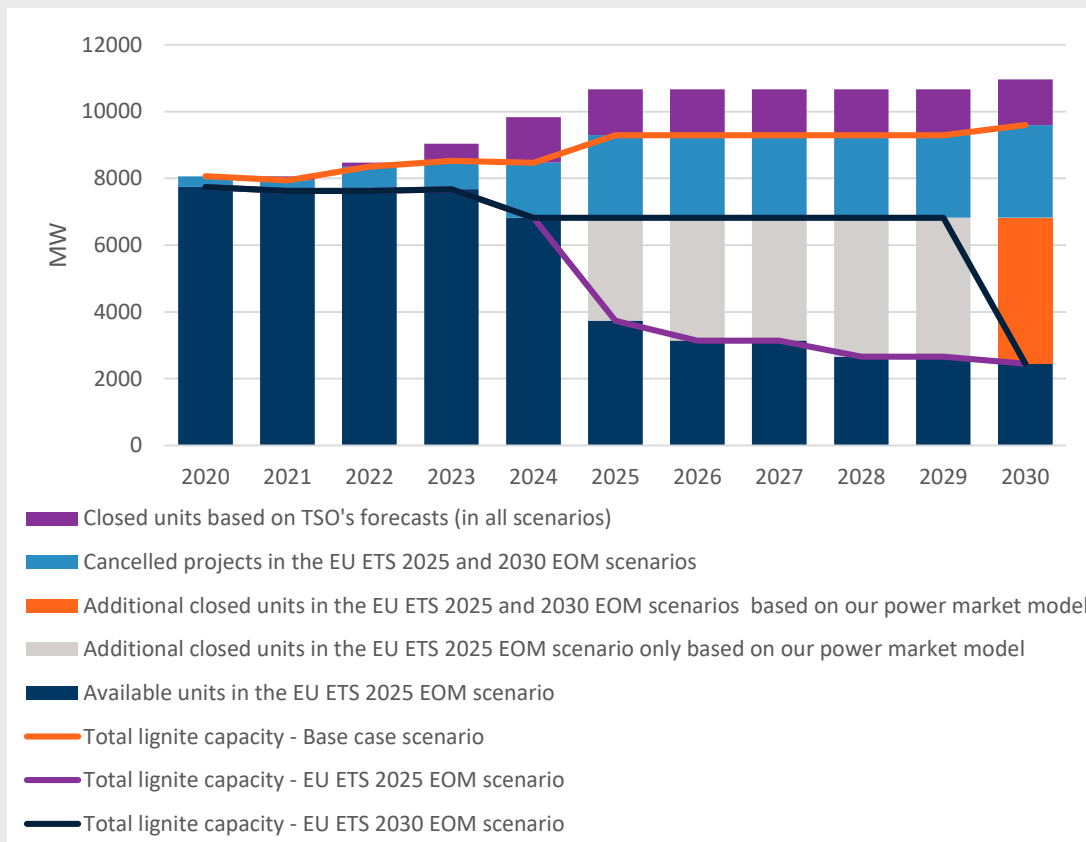


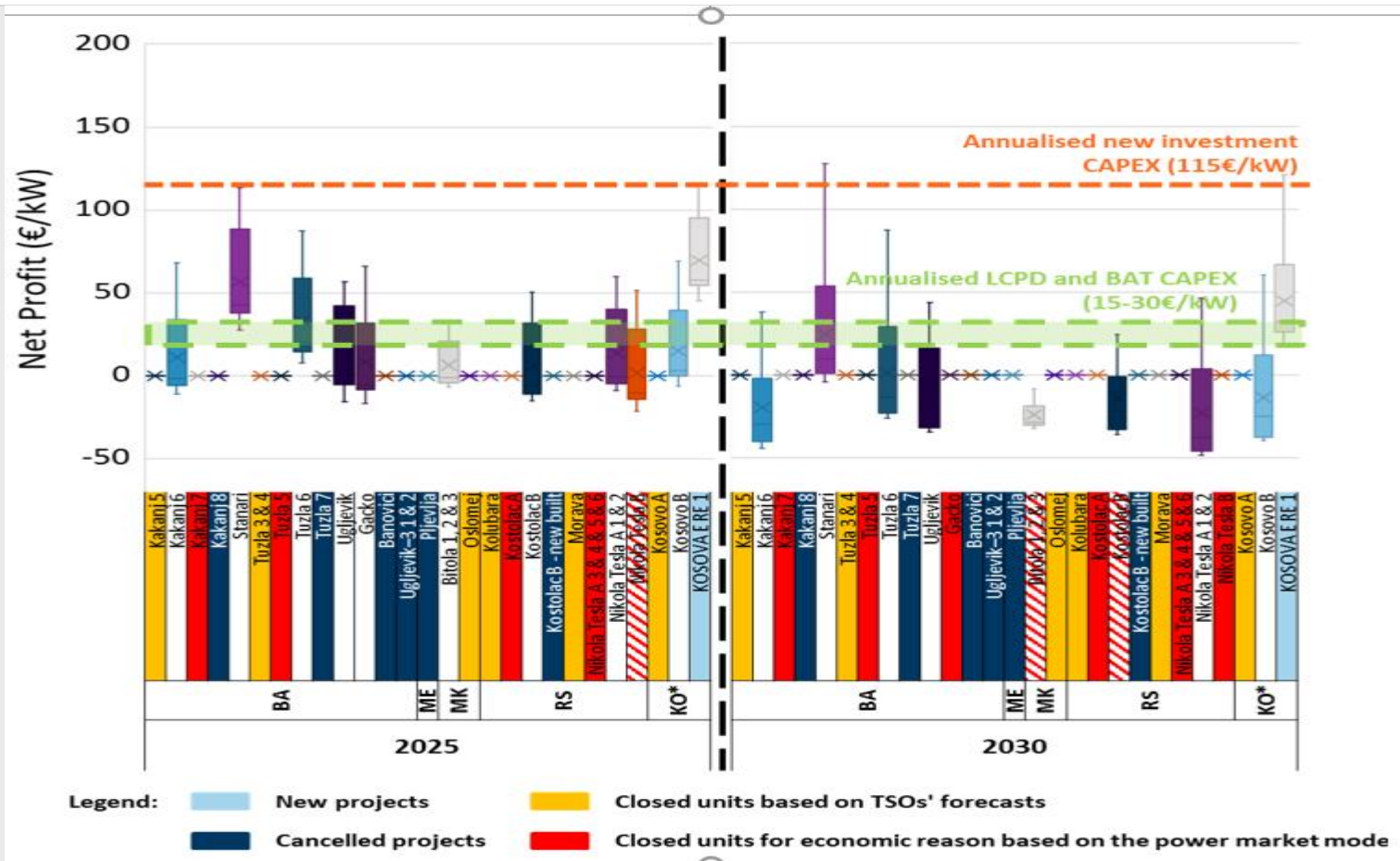
Figure 18: Net profit of lignite plants in the EU ETS 2030 EOM scenario



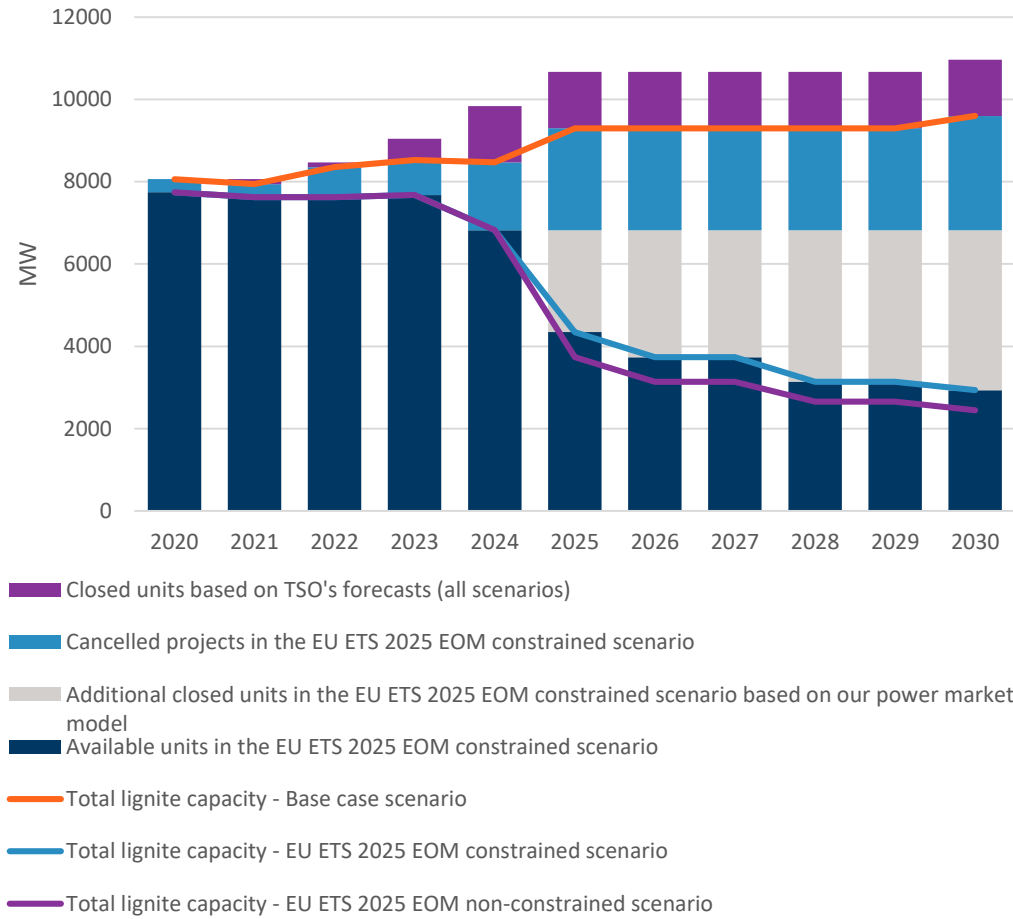
# Net capacity in MW



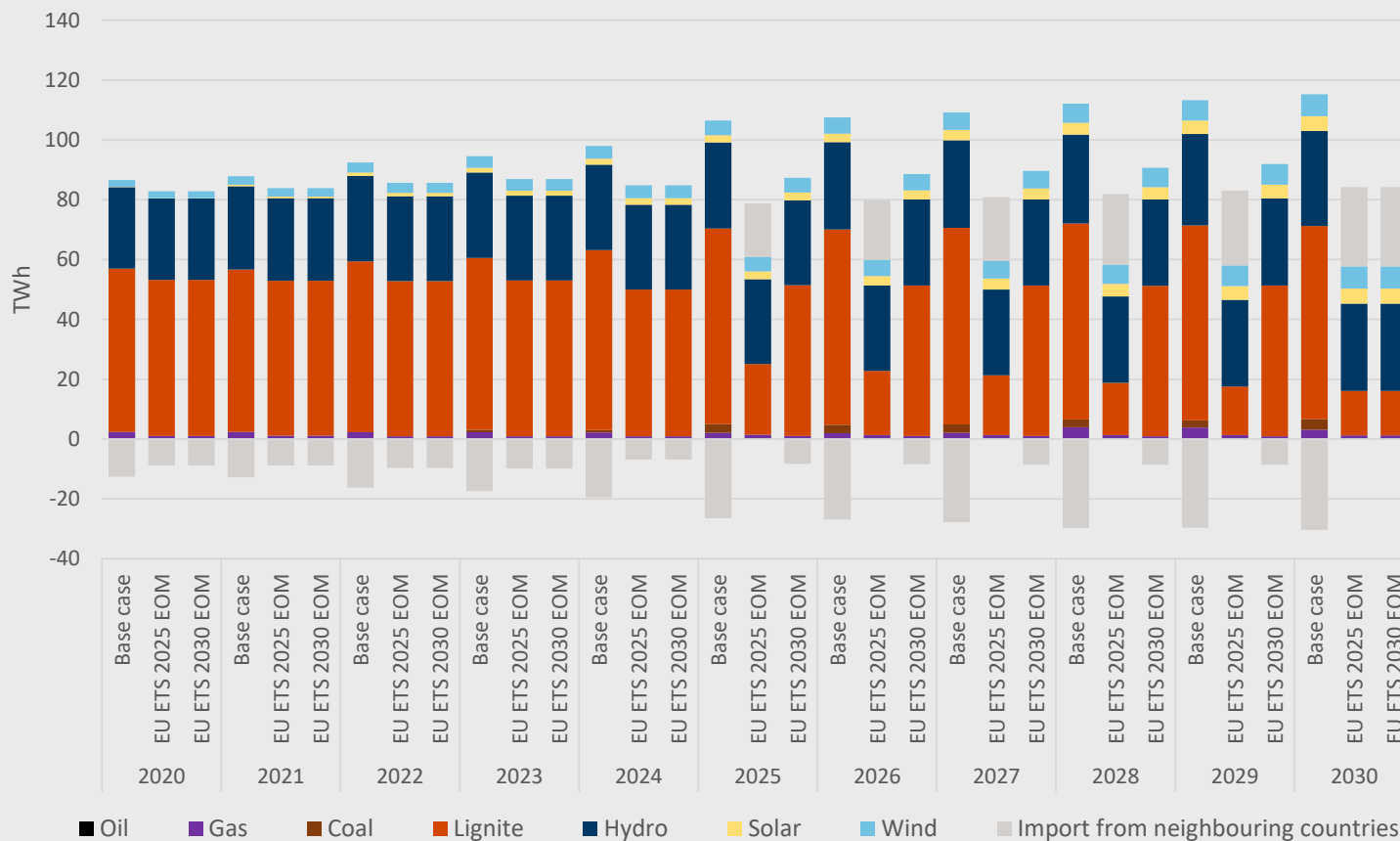
# Market model results – cross-border sensitivity



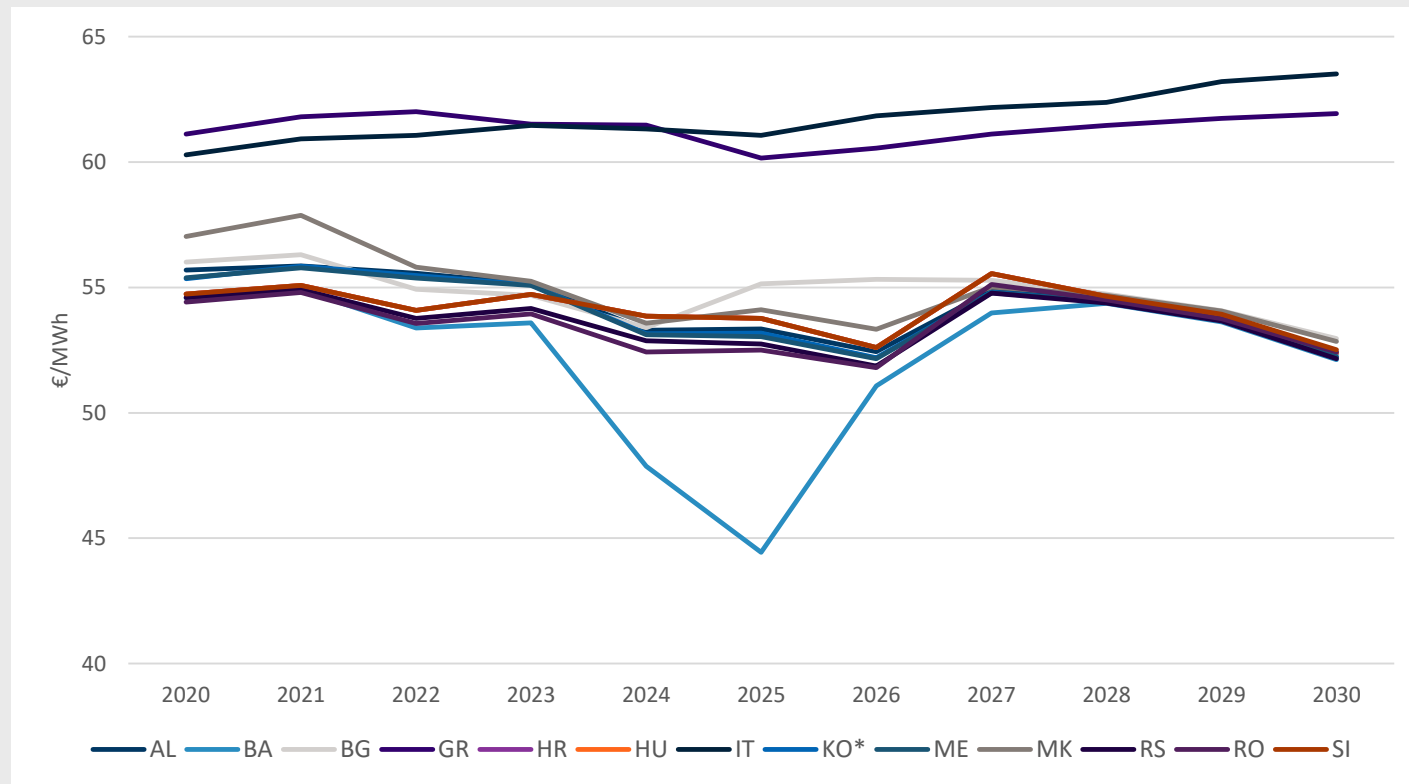
# Net capacity in MW – cross-border sensitivity



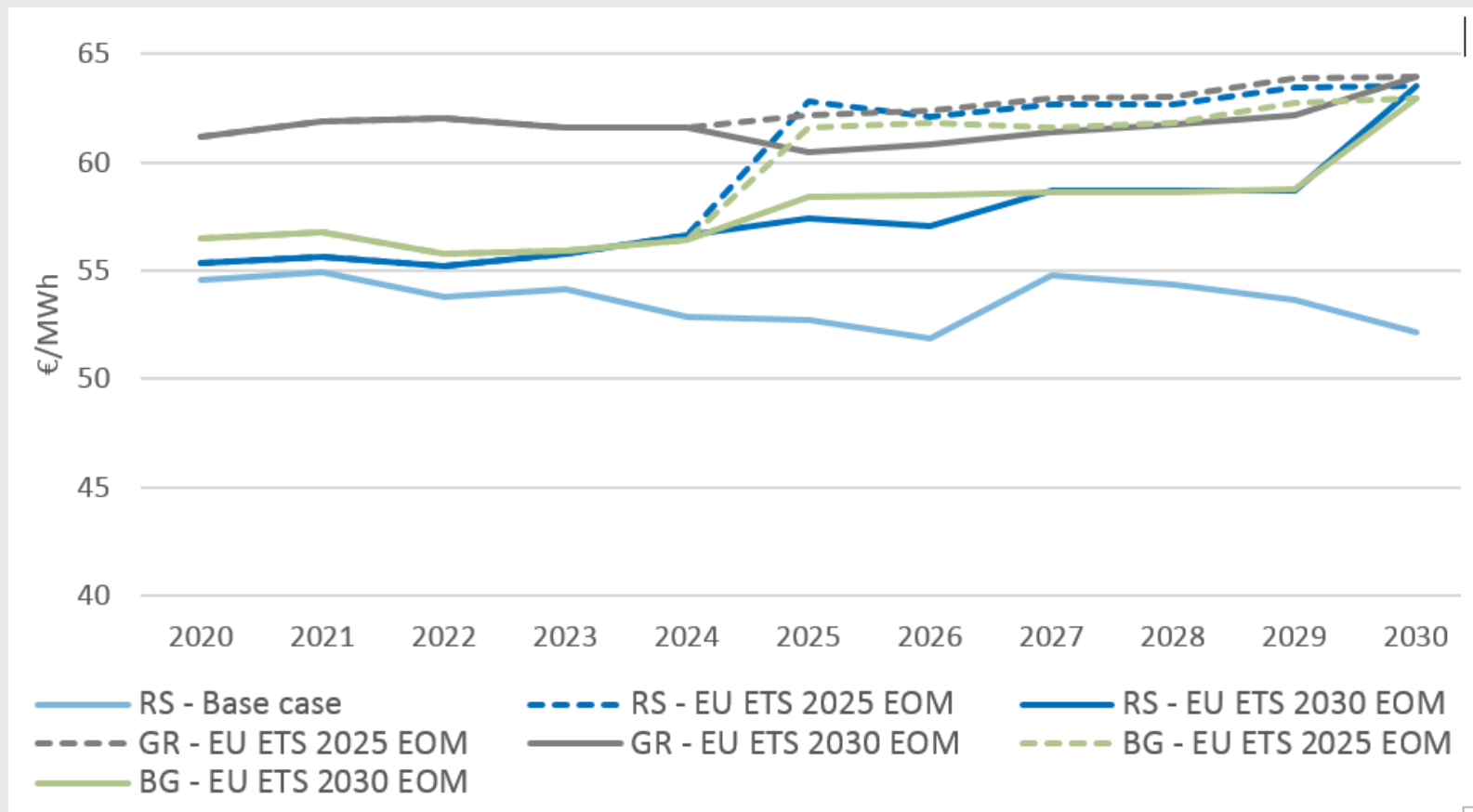
# Generation outlook



# Power price outlook – base case

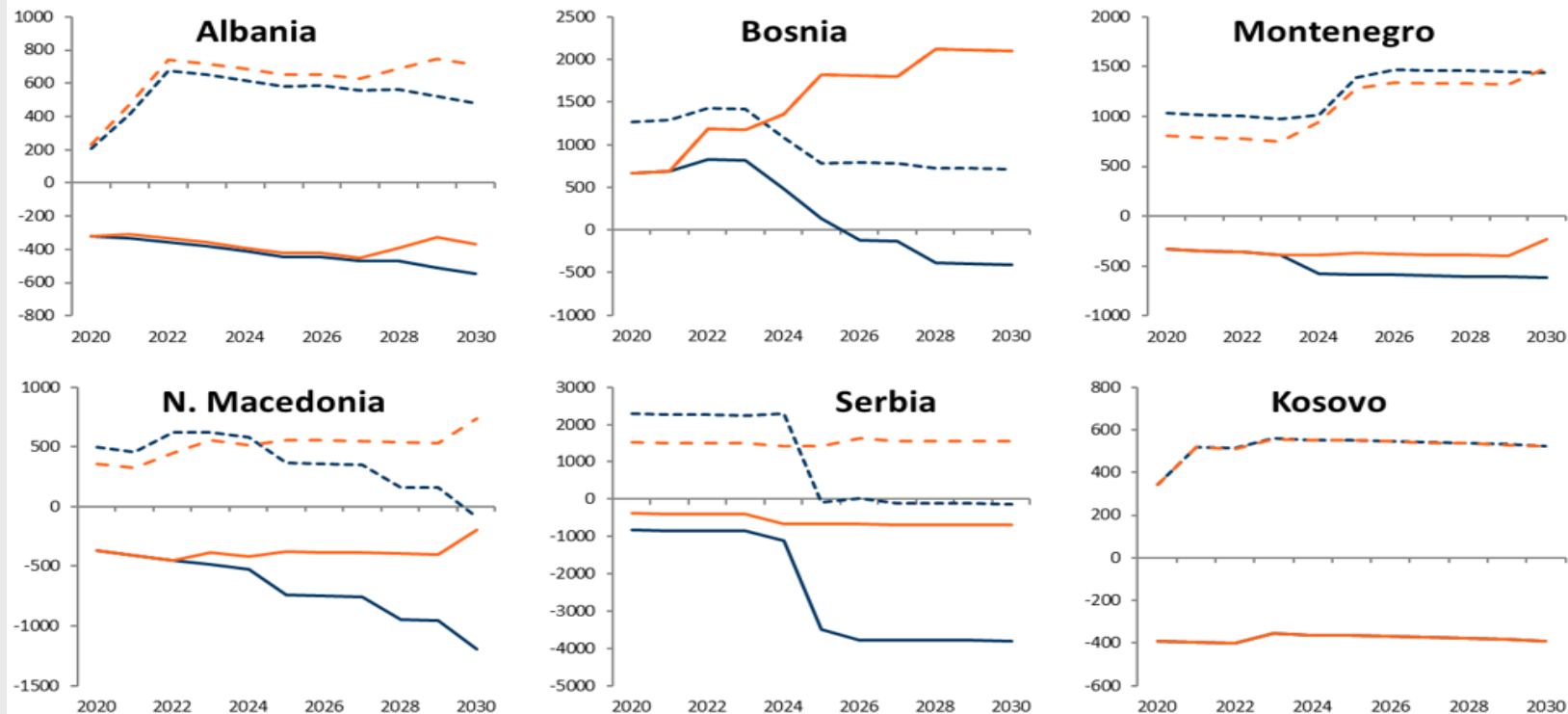


# Power price outlook – comparisons

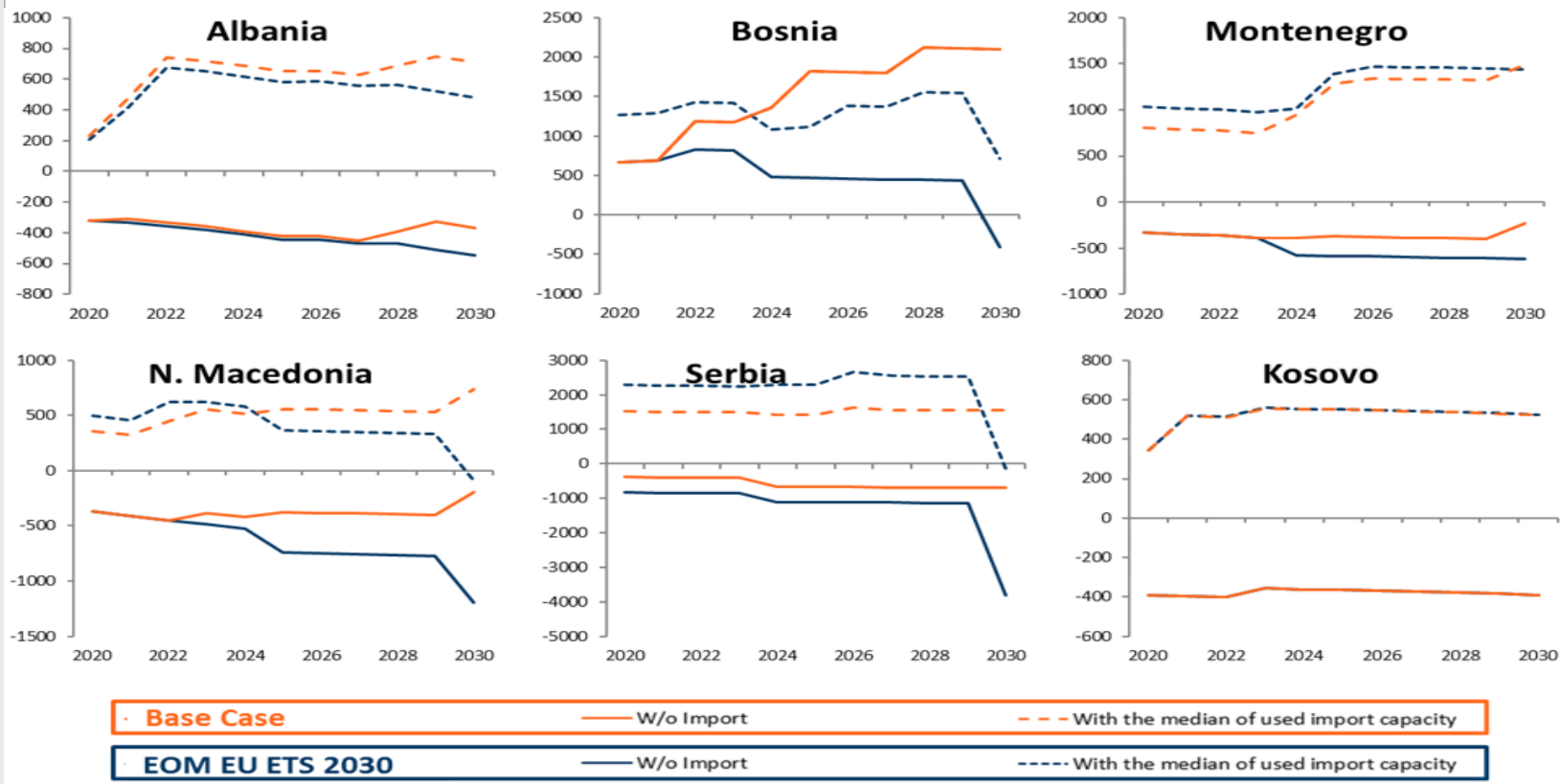




**Figure 25: Derated margin in WB6 countries in the EU ETS 2025 EOM (in MW)**

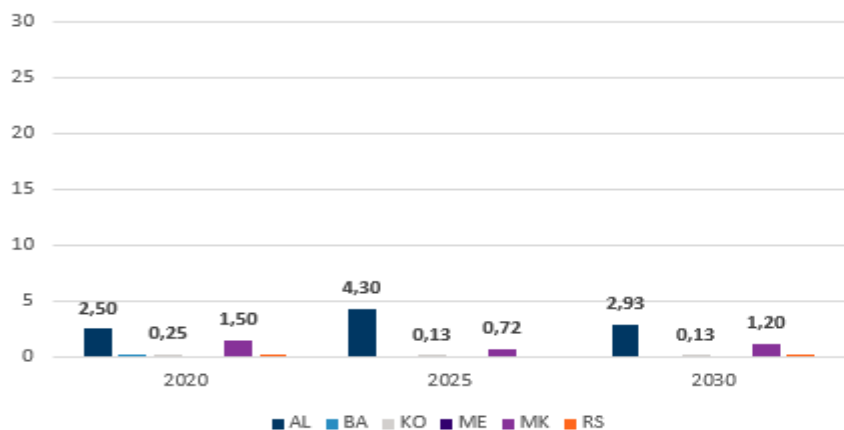


**Figure 26: Derated margin in WB6 countries in the EU ETS 2030 EOM (in MW)**

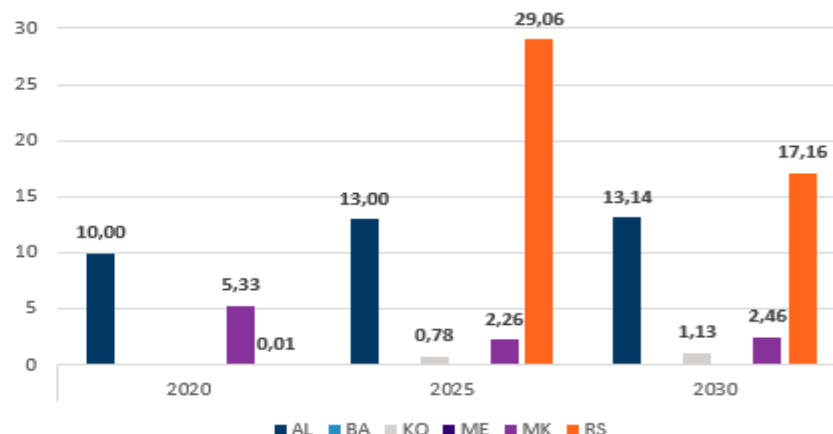


# Adequacy – Importance of interconnections

Loss of Load Expectation for WB6 countries, in the Base case scenario (number of hours per year)



Loss of Load Expectation for WB6 countries, in the EU ETS 2025 scenario (number of hours per year)



The background is a dark blue image of the Earth from space, showing city lights at night. Overlaid on the globe are numerous glowing blue lines that curve and intersect, representing a global energy network or data flow.

*Thank you!*

[www.energy-community.org](http://www.energy-community.org)

[Arben.Kllokoqi@energy-community.org](mailto:Arben.Kllokoqi@energy-community.org)