EMBER

Ember's response to the public consultation on European Resource Adequacy Assessment

Ember submitted feedback to the the Call-for-Evidence on Preliminary Input Data for the European Resource Adequacy Assessment 2025

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Background

The European Resource Adequacy Assessment (ERAA) plays a central role in the planning of the European power system. This pan-European exercise evaluates the security of power supply up to ten years ahead and guides policy-makers in their decisions about capacity markets. It will also form a key element in the upcoming national flexibility needs assessments.

Detail of inquiry

ERAA 2025 Call-for-Evidence on Preliminary Input Data - Opened 31 March 2025 and closed on 22 April 2025. The purpose of the consultation was to gather evidence-based feedback from stakeholders and industry experts on the ERAA 2025 scenarios.

Link to consultation:
https://consultations.entsoe.eu/system-development/eraa2025-call-for-evidence-preliminary-data/

Commodity prices are out of step with futures prices

Commodity prices are a crucial variable in the ERAA modelling as these assumptions have direct implications on dispatch and the investment case for different generation technologies.

ENTSO-E proposes to use fossil fuel and CO2 prices from the IEA World Energy Outlook 2024 - Announced Pledges Scenario - Europe (IEA APS). Ember has **benchmarked these with futures prices for 2030** to assess whether these constitute a realistic outlook for the medium-term. The average futures prices include all of 2024 and up to 14 April 2025 - to capture futures after the effects of the energy crisis (except in the case of hard coal where prices are only from 30 December 2024).

It is clear that the prices proposed to be used by ENTSO-E are out of step with futures prices. Fossil fuel prices in 2030 are significantly underestimated by the IEA while those of CO2 are over estimated.

Commodity - 2030 prices	ERAA 2025	Futures - average*	% difference	Futures - min*	Futures - max*
Natural gas (€/GJ)	5.4	7.2	-26%	6.6	8.2
Hard coal (€/GJ)	2.4	3.7	-35%	3.4	4.04
CO2 price (€/ton)	127.43	83.2	+53%	64.6	97.8

**Average, minimum and maximum figures are calculated over the period 1 Jan 2024 to 14 April 2025 for natural gas and CO2 prices, and 30 December 2024 to 14 April 2025 for hard coal due to limited data availability before then.*

The proposed ERAA 2025 prices were also compared to the recent price projections used by the **European Commission for their "With Additional Measures"** scenario (EC WAM) - which underlie the upcoming PRIMES reference scenario and were provided to Member States to aid their preparation of updated NECPs. The outlook of the IEA APS fossil fuel prices is opposite to the EC WAM. The former foresees fossil fuel prices will decrease over time while the EC WAM expects them to increase (except in the case of coal, which sees a small decrease of 5% between 2030 and 2040). **The differences in 2030 are significant**. IEA APS prices are 40% lower for natural gas and coal than EC WAM prices, while those for CO2 prices are 34% higher. The EC WAM price projections are much closer to the forward curves than those of the IEA APS.

Commodity	ERAA 2025	EC WAM	% difference
Natural gas (€/GJ)	5.37	9	-40%
Hard coal (€/GJ)	2.4	4	-40%
CO2 price (€/ton)	127	95	+34%

Ember raises strong concern over the use of IEA APS prices for the ERAA 2025. This **risks significantly misrepresenting commodity prices in the medium-term,** resulting in dispatch and investment outputs that do not reflect cost-optimal actions.

Improve representation of batteries and demand flexibility potential

Battery storage and demand flexibility are relatively cheap-to-implement clean flexibility solutions, readily available and much faster to deploy than alternatives such as gas peaker plants or grid interconnections. Underestimating or misrepresenting their potential brings the risk of overinvesting in fossil assets and increasing fossil dependence. ***Ember strongly suggests that ERAA 2025 improves representation of battery storage and demand flexibility*** to more realistically reflect current market trends.

- ERAA 2025 preliminary values for Implicit and explicit DSF potential by 2030 (39 GW across the EU) are significantly lower than industry assessments, which anticipate around 160 GW and 130 GW of upward and downward flexibility respectively in the EU by 2030. Moreover, for the large majority of EU countries, the demand shifting potential from EVs and heat pumps by 2030 is assumed to be zero in ERAA 2025. This could fail to reflect the acceleration towards electrification, which is a key part of the European Commission policy agenda .
- Battery storage deployment trajectory in ERAA2025, which assumes 136 GW installed in Europe by 2030, is lower than recent industry outlooks and not aligned with existing policy targets. The latest EASE outlook suggests that Europe's battery capacity could reach 163 GW by 2030, with an additional 128 GW of batteries projected to be added to European grids, up from 35 GW installed at the end of 2024. For some countries, such as Spain and Greece, ERAA assumptions on installed battery or storage capacity by 2030 are lower than what is assumed in the final NECPs, highlighting a potential disconnect with policy targets.

Consider recent cost reductions for battery storage technologies

ERAA 2025 preliminary default values for battery storage CAPEX do not consider any cost reductions for the rest of this decade. This conservative assumption fails to reflect that battery storage technology, similarly to solar panels, has undergone rapid cost reductions. The average price of lithium ion battery packs dropped $115 USD/kWh in 2024, falling by 20% compared to 2023 and is 84% lower than the average cost a decade ago. A very conservative assumption of 200 €/kWh, coupled with an ambitious 4 hours energy-to-power ratio, would still yield a CAPEX lower than the proposed default one (only specified for a 2 hours energy-to-power ratio battery) for all target years. As default values could be applied to a significant number of countries in the absence of country-specific studies, it is important that they reflect realistic market developments and future efficiency gains. At the same time, ERAA 2025 preliminary data shows significant divergence in country-specific battery CAPEX values for the same reference technology, which could undermine the potential synergy between storage and interconnection capacity in an expansion model. ***Ember strongly suggests that ERAA 2025 preliminary assumptions on CAPEX for battery storage are revised*** to take into account future efficiency gains and to ensure cross-zonal consistency in assumptions for EVA candidates.

Revise wind and solar generation capacity

Draft ERAA generation capacities for wind and solar were benchmarked against (1) NECP policy targets; and (2) market outlooks from SolarPower Europe and WindEurope. Where the ERAA figures are below BOTH policy targets and market forecasts, ***Ember strongly suggests that these are revised*** to better align with these medium-term outlooks. The specific cases are as follows:

For solar:

Country	ERAA 2028	SPE 2028*	ERAA 2030	NECP 2030
Spain	59.6	66.7	77	95
France	33.2	41.3	41.2	54
Poland	25.3	30.8	28.9	36.6
Portugal	7.3	11.6	15.1	20.8

**converted to AC using the assumption AC = 1.25 DC. It is assumed ERAA and NECP values are in AC.*

For wind:

Country	ERAA 2030	WindEurope 2030	National Plans 2030
France	33.5	35.6	36.6
Croatia	1.6	2.1	2.3
Latvia	0.6	1.8	1.3
Sweden	20.7	22.7	23.4
Türkiye	17.5	26.2	18.1