

# European Resource Adequacy Assessment

2025 Amended Edition following ACER's decision

## Annex 7 – Definitions & Glossary

The background of the lower half of the page is a blue-toned image of a globe. Overlaid on the globe is a complex network of white dots connected by thin white lines, resembling a digital or data network. The text 'ERAA' and '2025 Edition' is superimposed in a large, semi-transparent, light blue font over the center of the globe.

**ERAA**  
**2025 Edition**

**Explicitly Modelled Systems** – Electric systems which are modelled in detail. These systems shall be modelled considering each element of the probabilistic model set in the ERAA methodology.

**Flow-Based (FB)** – The flow-based approach pursuant to Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management.

**Flow-based Domain** – Set of constraints that limit the FB cross-zonal capacity.

**Flow-Based Market Coupling (FBMC)** – Mechanism to couple different electricity markets, increasing the overall economic efficiency, while considering the available transmission capacity between different bidding zones using the FB approach/model.

**Forced Outage (FO) (also Unplanned Outage)** – State of a capacity resource when it is unavailable in the power system and the unavailability was not planned.

**Frequency Containment Reserves (FCR) (also primary reserves)** – Frequency containment reserves pursuant to Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation.

**Frequency Restoration Reserves (FRR) (also secondary reserves)** – Frequency restoration reserves pursuant to Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation.

**Loss of Load Duration (LLD) [h/year]** – For a single node, the number of hours during which the node experiences ENS during a single Monte Carlo sample/simulation year. For a geographical area with multiple nodes, LLD is the number of hours during which at least one node of the area experiences ENS during a single Monte Carlo sample/simulation year. A null LLD suggests that there are no adequacy concerns.

**Loss of Load Expectation (LOLE) [h/year]** – In a given modelled zone and in a given time period, the expected number of hours in which resources are insufficient to meet the demand.

**MC** – Monte Carlo (i.e. related to the Monte Carlo method);

**Modelled zone** – Either a bidding zone, a country or another geographic area that is explicitly modelled in the ED. A modelled zone cannot be larger than a bidding zone or a country.

**MTU** – Market time unit pursuant to Transparency Regulation;

**NECP** – Integrated national energy and climate plan pursuant to Regulation (EU) 2018/1999 of the European Parliament and of the Council on the Governance of the Energy Union and Climate Action.

**Net Generating Capacity (NGC)** of a generation unit – The maximum net active electrical power it can produce continuously throughout a long period of operation in normal conditions, where:

- i. 'net' means the difference between, on the one hand, the gross generating capacity of the alternator(s) and, on the other hand, the auxiliary equipment load and the losses in the main transformers of the power station;
- ii. for thermal plants, 'normal conditions' means average external conditions (climate etc.) and full availability of fuels; and

- iii. for hydro, solar and wind units, 'normal conditions' means the nominal availability of primary energies (i.e. water, solar or wind conditions).

**Net Transmission/Transfer Capacity (NTC) approach/model** – The coordinated net transmission capacity approach pursuant to Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management.

**Non-explicitly Modelled Systems (also implicitly modelled systems)** – Electric systems which are not explicitly represented in the modelling framework in detail, and which are directly interconnected with an explicitly modelled system.

**Non-renewable Energy Sources** – Energy from non-renewable sources, namely oil, natural gas, coal, sewage treatment plant gas and nuclear energy. Inverse of renewable energy sources.

**Planned outage** – State of a capacity resource when it is not available in the power system and the outage was planned in advance. These outages include maintenance.

**Renewable Energy Sources (RES)** – Energy from renewable sources pursuant to Directive (EU) 2019/944 of the European Parliament and Council of 5 June 2019 on common rules for the internal market for electricity.

**Replacement Reserves (RR) (also tertiary reserves)** – replacement reserves pursuant to Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation.

**Reserve Capacity** – The frequency containment reserves, frequency restoration reserves or replacement reserves that need to be available to the transmission system operator.

**Revenue** – Any income that a given capacity resource receives.

**Target Year (TY)** – A year simulated within the ERAA.

**Thermal Generation** – Production of electricity from thermal energy obtained from the conversion of primary energy sources, namely oil, natural gas, coal, nuclear energy, solar thermal, geothermal energy, biomass, landfill gas, sewage treatment plant gas and biogas.

**TYNDP** – ENTSO-E's ten-year network development plan.

**Unplanned Outage** – See Forced Outage.

**Value of Lost Load (VoLL) [€/MWh]** – An estimation of the maximum electricity price that each end user type is willing to pay to avoid an outage.

# Glossary

|         |                                                                    |
|---------|--------------------------------------------------------------------|
| AC      | Alternating Current                                                |
| ACER    | European Union Agency for the Cooperation of Energy Regulators     |
| ADEME   | Agence de l'Environnement et de la Maîtrise de l'Energie           |
| aFRR    | Automatic Frequency Restoration Reserve                            |
| AHC     | Advanced Hybrid Coupling                                           |
| C3S     | Copernicus Climate Change Service                                  |
| CAPEX   | Capital Expenditure                                                |
| CCGT    | Combined Cycle Gas Turbine                                         |
| CCM     | Capacity Calculation Methodology                                   |
| CCR     | Capacity Calculation Region                                        |
| CDF     | Cumulative Distribution Function                                   |
| CEP     | Clean Energy Package                                               |
| CEPA    | Center for European Policy Analysis                                |
| CHP     | Combined Heat and Power                                            |
| CM      | Capacity Mechanism                                                 |
| CNE     | Critical Network Element                                           |
| CNEC    | Critical Network Element and Contingency                           |
| CONE    | Cost of New Entry                                                  |
| CorRES  | Correlations in Renewable Energy Sources                           |
| CRM     | Capacity Remuneration Mechanism                                    |
| CSP     | Concentrated Solar Power                                           |
| CWE     | Central-Western Europe                                             |
| CY      | Climate Year                                                       |
| DA      | Day-Ahead                                                          |
| DC      | Direct Current                                                     |
| DCDF    | Direct Current Power Flow Distribution Factors                     |
| DFT     | Demand Forecasting Tool                                            |
| DSR     | Demand-Side Response                                               |
| ED      | Economic Dispatch                                                  |
| EENS    | Expected Energy Not Served                                         |
| ENS     | Energy Not Served                                                  |
| ENTSO-E | European Network for Transmission System Operators for Electricity |
| EOM     | Energy-Only Market                                                 |
| ERAA    | European Resource Adequacy Assessment                              |

|          |                                                              |
|----------|--------------------------------------------------------------|
| EU       | European Union                                               |
| EUPHEMIA | Pan-European Hybrid Electricity Market Integration Algorithm |
| EV       | Electric Vehicle                                             |
| EVA      | Economic Viability Assessment                                |
| FB       | Flow-Based                                                   |
| FBMC     | Flow-Based Market Coupling                                   |
| FCR      | Frequency Containment Reserve                                |
| FO       | Forced Outage                                                |
| FOM      | Fix, Operation and Maintenance (costs)                       |
| FOR      | Forced Outage Rate                                           |
| FRR      | Frequency Restoration Reserve                                |
| GCS      | Generation Capacity Statement                                |
| GSK      | Generation Shift Key                                         |
| HVAC     | High-Voltage Alternating Current                             |
| HVDC     | High-Voltage Direct Current                                  |
| IEA      | International Energy Agency                                  |
| JA0      | Joint Allocation Office                                      |
| LLD      | Loss of Load Duration                                        |
| LOL      | Loss of Load                                                 |
| LOLE     | Loss of Load Expectation                                     |
| LOLP     | Loss of Load Probability                                     |
| MACZT    | Margin Available for Cross-Zonal Trade                       |
| MAF      | Mid-Term Adequacy Forecast                                   |
| MC       | Monte Carlo                                                  |
| mFRR     | Manual Frequency Restoration Reserve                         |
| minRAM   | Minimum Remaining Available Margin                           |
| MTU      | Market Time Unit                                             |
| NECP     | National Energy and Climate Plan                             |
| NGC      | Net Generating Capacity                                      |
| NRA      | National Regulatory Authority                                |
| NRAA     | National Resource Adequacy Assessment                        |
| NTC      | Net Transfer Capacity                                        |
| O&M      | Operations and Maintenance                                   |
| OCGT     | Open Cycle Gas Turbine                                       |
| OWPP     | Offshore Wind Power Plant                                    |
| P2X      | Power-to-X                                                   |
| P50      | 50th Percentile                                              |

|          |                                                                      |
|----------|----------------------------------------------------------------------|
| P95      | 95th Percentile                                                      |
| p.u.     | Per Unit                                                             |
| PD       | Peak Demand                                                          |
| PDF      | Probability Density Function                                         |
| PECD     | Pan-European Climate Database                                        |
| PEMMDB   | Pan-European Market Modelling Database                               |
| POC      | Proof of Concept                                                     |
| PSDF     | Phase Shifter Distribution Factors                                   |
| PSP      | Pumped Storage Plant                                                 |
| PST      | Phase Shifting Transformer                                           |
| PTDF     | Power Transfer Distribution Factor                                   |
| PV       | Photovoltaics                                                        |
| RAM      | Remaining Available Margin                                           |
| RES      | Renewable Energy Source                                              |
| RoR      | Run-of-River                                                         |
| RR       | Replacement Reserve                                                  |
| RS       | Reliability Standard                                                 |
| SDAC     | Single Day-Ahead Coupling                                            |
| SEM      | Single Electricity Market                                            |
| SR       | Strategic Reserve                                                    |
| TES      | Thermal Energy Storage                                               |
| TRAPUNTA | Temperature Regression and IoAd Projection with UNcertainty Analysis |
| TSO      | Transmission System Operator                                         |
| TY       | Target Year                                                          |
| TYNDP    | Ten-Year Network Development Plan                                    |
| UCED     | Unit Commitment and Economic Dispatch                                |
| VoLL     | Value of Lost Load                                                   |
| VO&M     | Variable Operations and Maintenance                                  |
| WACC     | Weighted Average Cost of Capital                                     |
| WPP      | Wind Power Plants                                                    |
| WS       | Weather Scenarios                                                    |
| YD       | Yearly Demand                                                        |