ERAA Methodology Revision

Public webinar, 20 August 2025

Task Force ERAA Streamlining

entsoe
Reliable Sustainable Connected

Background

William Zappa
Convenor TF ERAA Streamlining, TenneT NL

Background

Why is the ERAA methodology being updated?

- ENTSO-E is mandated by the Electricity Regulation (2019/943) to perform the **European Resource Adequacy Assessment (ERAA)** on an annual basis. The current ERAA methodology was approved by ACER in 2020.

- The ERAA is the **key Pan-European tool** for Member States (MS) to monitor their security of supply. It can be complemented by National Resource Adequacy Assessments (NRAAs).

- **Implementation of the ERAA methodology has proved challenging** at European and national level

- MSs can only introduce a **capacity mechanism (CM)** if:
  - they have a reliability standard (RS) established according to the related methodology, and
  - an adequacy concern has been identified either in the ERAA, or in their NRAA.

- The 2024 review of the Electricity Regulation asks the European Commission (EC) to:
  - issue a report on proposals to streamline & simplify the process of applying for a CM, and
  - request ACER to update the ERAA methodology

Introduction & Background

Main recommendations from the CM streamlining report and ACER letter

Scenario Framework

- Explicitly model only a **subset of target years in the 10-year horizon**
- **An additional scenario** reflecting actual pace of the energy transition
- Indicators to be developed to **enable a comparison between scenarios**
- Greater role for a **scenario variant with approved CMs** (i.e. 'with CM')

Economic Viability Assessment

- Shift from system-cost minimization to **revenue-based approach**
- Better modelling of **risk aversion** via 'hurdle rates'
- Sharpen the ERAA implementation towards **non-fossil flexible resources**

Simplified State aid approval process

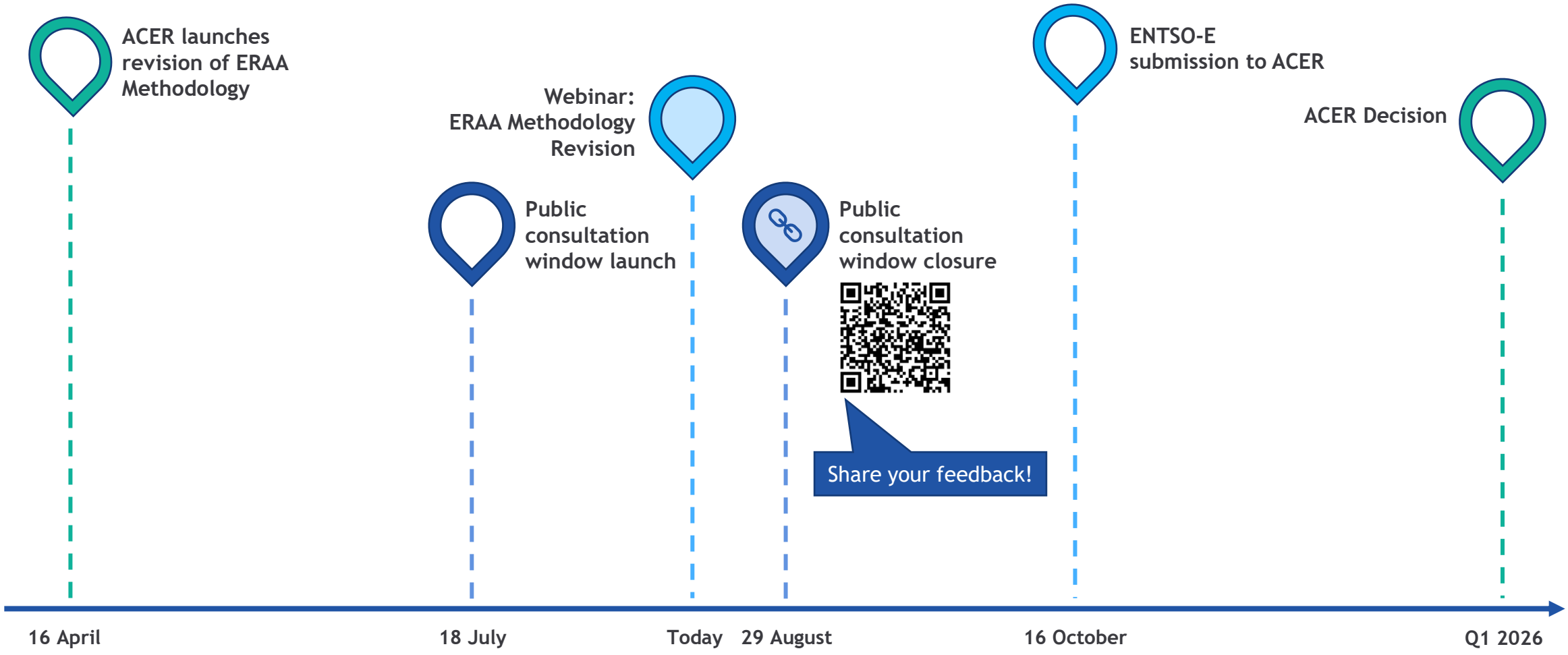
To support a simplified state-aid procedure:

- ERAA should estimate the **volume of capacity to procure** for each BZ based on the identified "adequacy gap"
- ERAA should calculate and publish **de-rating factors** for different technologies (under ACER supervision)
- ACER should calculate and publish a "**reference VOLL**" for all MSs and **reference CONE** values at EU level, allowing MSs to establish their reliability standard swiftly

CM: Capacity Mechanism, CONE: Cost of New Entry, VOLL: Value of Lost Load

Background

Methodology update timeline



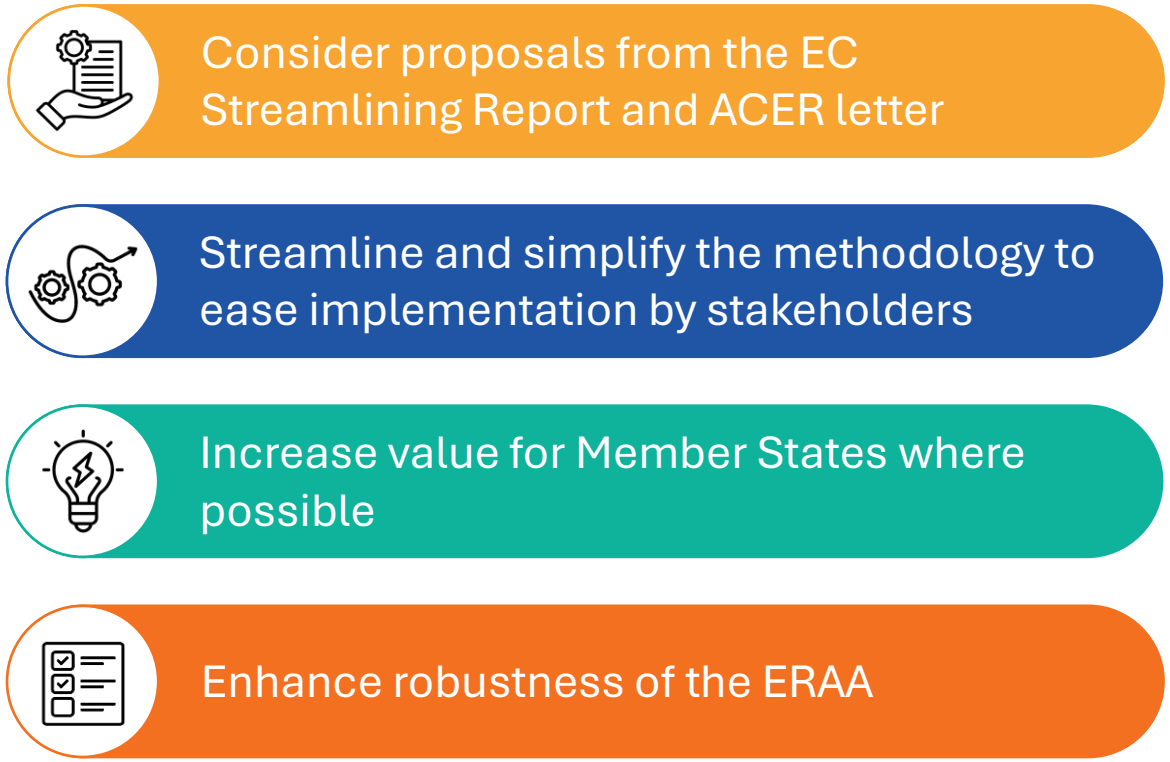
ACER intervention

ENTSO-E draft proposals for the ERAA Methodology revision

William Zappa
Convenor TF ERAA Streamlining, TenneT NL

Overview of proposed amendments

Considerations of ENTSO-E in proposing amendments to the ERAA methodology



Overview of proposed amendments

Main amendments proposed by ENTSO-E

Scenario framework

- ❑ Focus explicit simulations on a **subset of pivotal target years**
- ❑ **A new central reference scenario** where NECPs are not fully achieved (‘*Trends & Projections*’)
- ❑ Reassignment of the ‘with CMs’ scenario as a **variant**

Economic Viability Assessment

- ❑ Improvements to **investor risk aversion** approach
- ❑ Consideration of **relevant revenues** in EVA
- ❑ Introduction of **construction period** for new investments
- ❑ Introduction of an alternative form of revenue-based EVA, (an **Economic Viability Check** (EVC))

Identification of adequacy concerns & NRAA complementarity

- ❑ Clarification of the **principle of complementarity** between ERAA and NRAAs
- ❑ Possibility for **sensitivities** to identify adequacy concerns

Additional outputs to support a simplified State aid approval process

ENTSO-E is seeking stakeholder views on this topic, based on several considerations

Scenario framework

Scenario Framework

Current methodology

Current Methodology

Both scenarios NECP compliant

Without CMs

- **Existing CM contracts**
- Additional capacity needed to reach RS

With CMs

- **Existing CM contracts**
- Additional capacity needed to reach RS

Additional central reference scenario

\+

Trends & Projections

Reflecting pace of energy transition

Scenario Framework

Additional scenario: Proposal

- **Introduce a new central reference scenario "Trends & Projections"** :
  - policy targets taken as granted in the current ERAA scenario are not fully achieved on time due to implementation delays (e.g. policy and deployment risks)
  - takes into account current trends and projections and the actual progress of MSs towards delivering their NECPs
- Priority should be on the impact of **supply-side delays**, reflecting impact of lower buildout of e.g. policy-driven RES, (low-carbon) thermal, hydro and storage capacity.
- **Additional dimensions could also be included** such as (delayed) load and network infrastructure, but not mandatory given additional data and modelling requirements to perform two separate scenarios
- **Only one scenario should be mandatory** in any given ERAA edition, to ensure feasibility of delivery:
  - This would allow for all relevant dimensions of the considered scenario to be taken into account.
  - ENTSO-E may be able to consider multiple central reference scenarios in the same edition in the longer term.

Scenario Framework

Current methodology

Current Methodology

Both scenarios NECP compliant

Without CMs

- **Existing CM contracts**
- Additional capacity needed to reach RS

With CMs

- **Existing CM contracts**
- Additional capacity needed to reach RS

How to include an **additional central reference scenario?**

\+ Trends & Projections ?

Scenario Framework

ENTSO-E proposed amendment

Baseline Scenarios

National Plans

- **Existing CM contracts**
- Additional capacity needed to reach RS

NECP-compliant scenario

Trends & Projections

- **Existing CM contracts**
- Additional capacity needed to reach RS

Reflecting pace of energy transition

Additional 'with CM' variants (non-mandatory)

National Plans + CM

- **Existing CM contracts**
- Additional capacity needed to reach RS

NECP-compliant scenario

Trends & Projections + CM

- **Existing CM contracts**
- Additional capacity needed to reach RS

Reflecting pace of energy transition

Scenario Framework

Priority of the ‘with CM’ variant

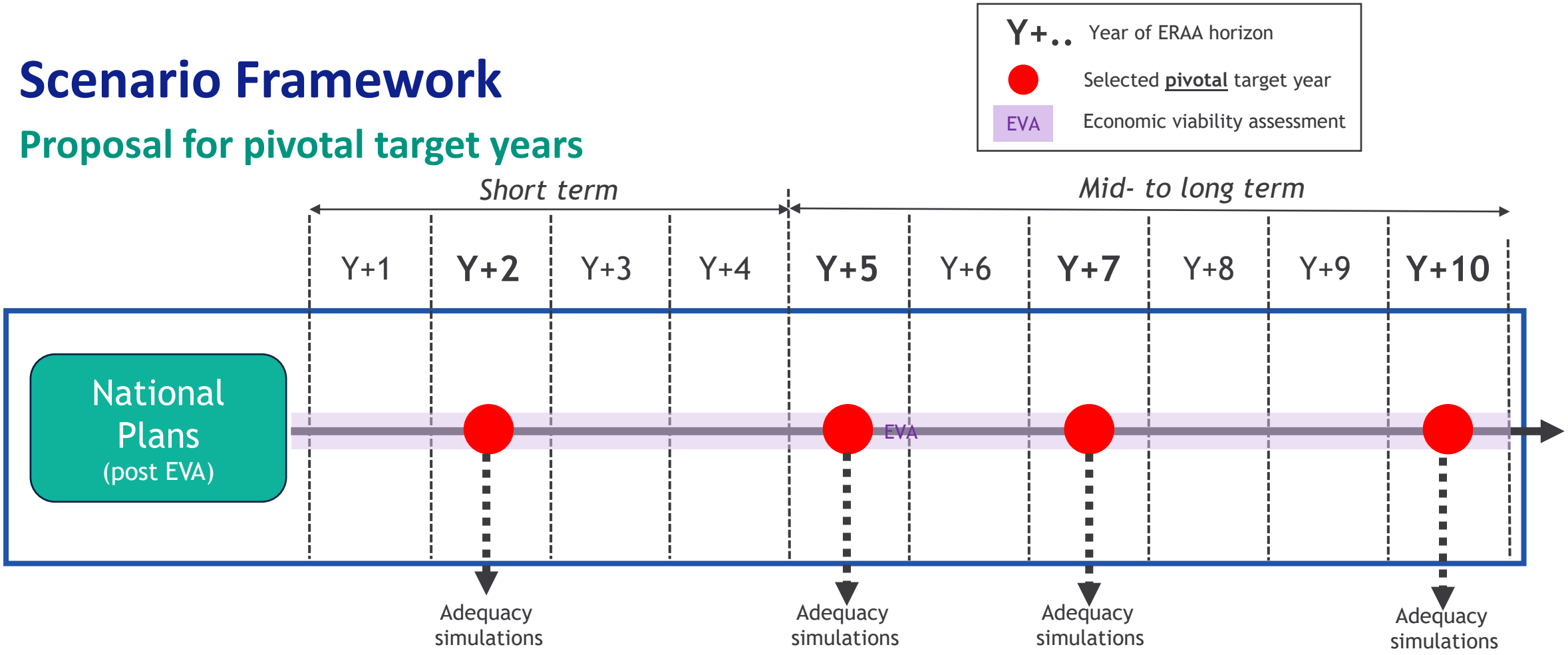
- Experience from ERAA 2021 shows a ‘with CM’ variant is **very challenging computationally** to perform and methodological questions remain at pan-EU level:
  - Calibration of each MS (with a CM) to their RS would require several iterations of the adequacy model
  - National CM designs are varied and complex, difficult to capture all these differences robustly
  - Assignment of capacities to MSs is partly arbitrary: many solutions possible (or perhaps none)

- Making this scenario a mandatory requirement would **significantly increase the risk** of not delivering ERAA on time, potentially hindering streamlining efforts (also potential implications for NRAAs)

- To ensure feasibility of delivering the ERAA, ENTSO-E proposes this variant is **non-mandatory**, and only performed by ENTSO-E in ERAA once **certain conditions are met**:
  - technical feasibility,
  - on agreement between ACER and ENTSO-E, and
  - its inclusion does not hinder the timely submission of the ERAA.

Scenario Framework

Proposal for pivotal target years



- Subset of pivotal target years to be decided by ENTSO-E, in consultation with ACER
- Years which are multiples of 5 (e.g. 2030, 2035) included by default to coincide with typical milestone years for national and EU policies

Economic Viability Assessment

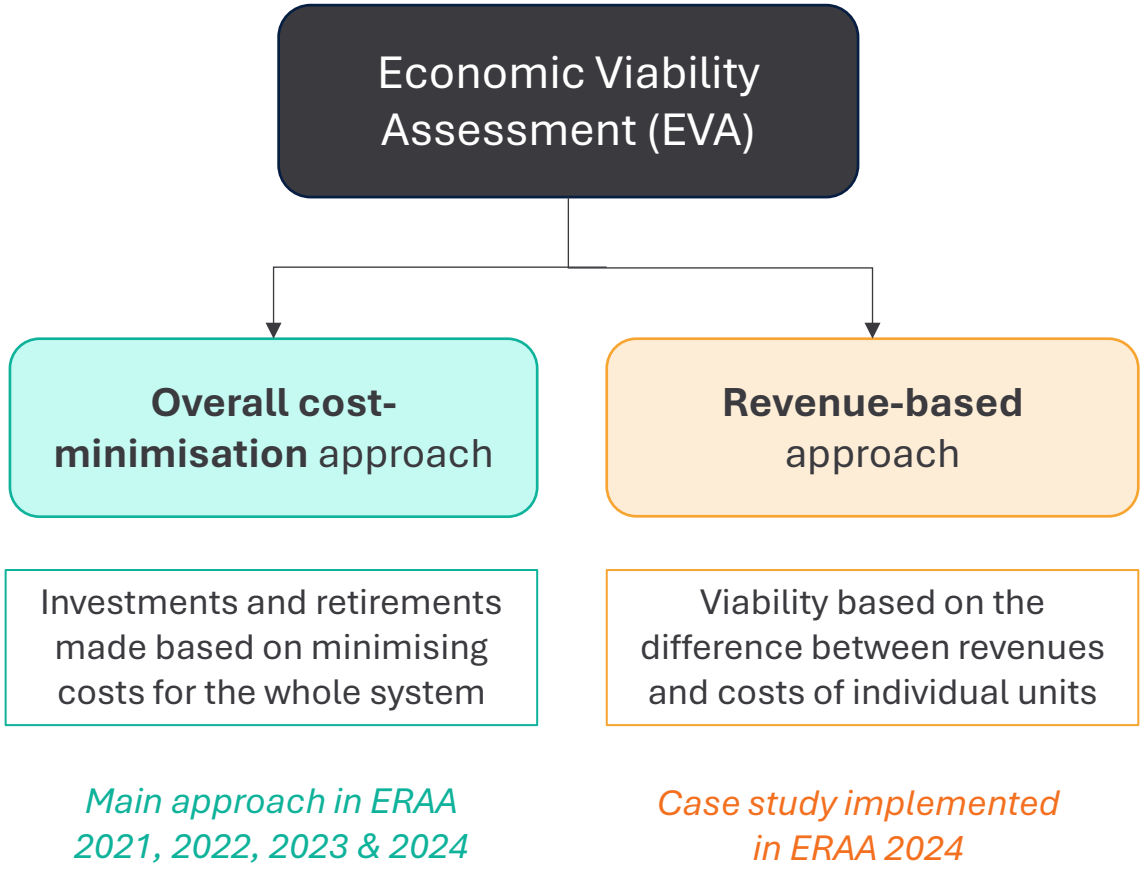
Economic Viability Assessment

Current ERAA methodology

- The Economic Viability Assessment (EVA) shall **assess the likelihood** of retirement, mothballing, and new-build of generation assets (Art 23(5)(b) of the ER)

- **Two approaches** possible in the current methodology (Art 6(2)):
  - Revenue-based approach
  - Overall cost-minimisation approach

- Based on the viability of each resource, the EVA shall **consider** retirement (or mothballing) of unviable capacity, life extension, and investment in new viable capacity



Economic Viability Assessment

Lessons from the current EVA implementation

- Investment modelling is **computationally complex**, and sensitive to input assumptions
- Current EVA is a **proxy of the market** based on a set of assumptions, some of which may not be fully valid (especially in the short term) e.g.
  - The market is at equilibrium
  - Investors have perfect foresight
  - Investments are coordinated
  - No barriers to market entry & exit
- EVA model outcomes are taken as **certain**, while the objective of EVA in the ER is to *'assess likelihood'*
- Significant expansion observed in previous ERAA cycles based on high prices in few hours: stakeholders calling to improve **modelling of investor risk aversion** to ensure it reflects real-world investor behavior
- Due to complexity, **not all MSs can perform investment modelling** *(link to ERAA-NRAA complementarity)*
- ENTSO-E also conducted an **investor survey** to gather feedback from stakeholders, and further insights on investor behaviour

Economic Viability Assessment

Main proposals regarding EVA

Proposal	Description
Improvements to **investor risk aversion approach**	**Hurdle rate approach** to be listed as main risk aversion approach, applied to all revenue types (not only wholesale revenues). However, to ensure robust modelling of investor risks which are not able to be fully captured in hurdle rates: • complementary approaches and criteria can be considered based on industry practice • reaction to price spikes should be consistent with real investor behaviour
Consideration of only key **relevant revenues** for economic decisions in EVA	• Only the **relevant revenues** should be considered, which may differ between technologies and decisions (e.g. retirement, investment, mothball etc.) • Other simplifications possible (e.g. exclude unit from EVA, if viability likely guaranteed)
Introduction of **construction period** for new-build capacity	**Required construction time** for new-builds should be explicitly added in the methodology, accounting for permitting time, as well as construction and commissioning
EVA approach (system cost vs. revenue-based)	**Both approaches should remain** and potentially used complement each other
Introduction of an **economic viability check** (EVC)	**Alternative implementation** of the revenue-based EVA approach, to be introduced alongside the current investment modelling approach, as an implementation choice to apply in ERAA or NRAAs (see next slide)

Economic Viability Assessment

Differences between current approach and an Economic Viability Check

Current EVA: Investment modelling

- **Approach:** Either (a) system cost minimization, or (b) comparison of expected revenues vs. costs
- **Outcome:** an endogenous set of decisions about plant retirements, investment, and (de)mothballing and life extension
- **Computationally challenging**, large-scale cost optimization or iterative revenue-based approach
- **Considers a multi-year horizon**
- **Considers a limited** number of climate years to ensure computational feasibility

Economic Viability Check

- **Approach:** Comparison of expected revenues vs. costs
- **Outcome:** an assessment of the likelihood of plant viability, and likelihood of capacity exiting (or entering) the market
- **Computationally simpler**: Assessment based on adequacy simulation results, with (potential) additional adequacy runs e.g. without unviable capacity
- **May consider a single target year at a time**
- **May consider more climate years** than the investment model, to refine the economic performance
- **May consider more country-specific market data** (e.g. futures prices, ancillary services prices) to enhance robustness

Identifying adequacy concerns & ERAA-NRAA complementarity

Identifying adequacy concerns & NRAA complementarity

Conditions to identify an adequacy concern

- As per Article 20 and 24 of the Electricity Regulation:
  - **MSs may carry out NRAAs** to complement the ERAA, which should be based on the ERAA methodology.
  - Both ERAA and NRAAs can be used to **identify adequacy concerns**

- According to the current ERAA methodology Art 8.1(b),
  - a resource adequacy concern can only be identified if the reliability standard is exceeded in **“at least one central reference scenario”,**
  - sensitivities are not capable of identifying a resource adequacy concern

- **Different interpretations of the ER (Art 24(1))** are possible regarding what scenarios and sensitivities can be considered in NRAAs, which has implications for whether they can be used to identify a resource adequacy concern (especially since ACER approval of the ERAA)

Identifying adequacy concerns & NRAA complementarity

Potential implications of the ERAA 2023 approval

Electricity Regulation (ER) Art 24(1)

- NRAAs "shall contain" the [ERAA] reference central scenarios
- May take into account additional sensitivities

Interpretation possibilities

A

A NRAA must be based exclusively on the ERAA central reference scenarios* and can only perform additional sensitivities

B

A NRAA can update the ERAA central reference scenarios, and define their own central reference scenarios**

Implications

A

NRAAs cannot identify a resource adequacy concern, unless sensitivities can be used to identify a resource adequacy concern

B

To identify a resource adequacy concern, NRAAs would need to elaborate their own central reference scenarios potentially satisfying all the respective requirements (e.g. including EVA)

*except if there is none, as was legally the case before the ERAA 2023 approval
** if NRAAs could not update ERAA or consider different scenarios, a NRAA would simply be a rerun of ERAA which adds no value

Identifying adequacy concerns & NRAA complementarity

Proposed amendments to the methodology

- Clarify **the principle of complementarity** between ERAA and NRAAs in the recitals of the methodology. In the draft methodology amendment, currently framed as three options available to MSs to identify a resource adequacy concern:

  a) **ERAA results can be used directly**

  b) Starting from the latest ERAA data and models, MSs may perform a NRAA which **includes additional sensitivities** to assesses the most important country-specific and relevant risk(s) and uncertainties of either national, regional or pan-European nature, or

  c) Starting from the latest ERAA data and models, MSs may perform a NRAA which **fully updates the ERAA central reference scenarios** based on more recent data and assumptions, **or even elaborates additional central reference** scenarios (and sensitivities) to assess the most important country-specific and relevant risk(s) and uncertainties of either national, regional or pan-European nature

- **Allow sensitivities to be used to identify adequacy concerns**, as well as central reference scenarios (Article 8)

Additional outputs to support a simplified State aid approval process

Additional outputs to support a simplified State aid approval process

ENTSO-E considerations

- The current scope of ERAA is to **identify potential resource adequacy concerns**, not address them.
- Any potential extension of the ERAA's scope **should go no further than needed** to facilitate the simplified State aid procedure, without encroaching on the competencies of MSs to manage their security of supply.
- **Significant technical challenges** to estimating 'volumes to procure' under potential CMs within the ERAA process (e.g. MEC values not available, national data, auction parameters)
- CISAF (Annex I) does not necessarily require volumes to procure and de-rating factors to be computed by ENTSO-E within the ERAA process.
- Other ways of facilitating the fast-track process - potentially outside the ERAA - could be considered.

Stakeholders are invited to share their views on these considerations and request for additional outputs in the public consultation

Conclusion

Summary

- **ENTSO-E is proposing several amendments** to the ERAA methodology based on proposals from the EC streamlining lining report, and ENTSO-E's lessons learned in performing four editions of the ERAA
- Several **key proposals** are:
  - Introducing a second central reference scenario 'Trends and Projections', reflecting the actual pace of the energy transition and, in particular, of the deployment of RES and other policy-driven capacity;
  - Requiring only a subset of target years in the 10-year ERAA horizon to be simulated explicitly;
  - Improving the modelling of investor risk aversion in the economic viability assessment (EVA) via explicit use of the 'hurdle rate' approach, while allowing for additional complementary approaches;
  - Clarifying how the complementary role of the ERAA and NRAAs in identifying adequacy concerns is ensured;
  - Introducing an alternative implementation of the revenue-based approach in the EVA
- ENTSO-E looks forward to working closely with ACER, the EC and other stakeholders to revise the ERAA methodology in a way that ensures analytical robustness and policy relevance, while ensuring it can be delivered within the legal timeframe.

Share your views and suggestions during the public consultation!

Share your views in the public consultation

Related

- Revised ERAA Methodology - clean
- Revised ERAA Methodology - track changes (for information only)
- Explanatory note to the revised ERAA Methodology
- Summary of responses to ERAA Investor survey

Contact us at info@entsoe.eu in case of any questions!

Public Consultation is OPEN

Closing date: 29 August 2025

Consultation page

https://consultations.entsoe.eu/system-development/revision-of-eraa-methodology/

Our values define who we are, what we stand for and how we behave.
We all play a part in bringing them to life.

EXCELLENCE

We deliver to the highest standards. We provide an environment in which people can develop to their full potential.

TRUST

We trust each other, we are transparent and we empower people. We respect diversity.

INTEGRITY

We act in the interest of ENTSO-E

TEAM

We care about people. We work transversal and we support each other. We celebrate success.

FUTURE THINKING

We are a learning organisation. We explore new paths and solutions.

We are ENTSO-E