ACER
European Union Agency for the Cooperation of Energy Regulators

Evaluation report

Public consultation on economic input data for European electricity system modelling establishing the EU CONE Dataset

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Executive summary

Reliable and transparent economic input data is essential for robust long-term electricity system modelling in Europe. It affects how future adequacy needs are assessed, supports understanding of how investment and retirement decisions shape the future resource mix in Member States and has an impact on the determination of the optimal level of security of supply is determined. Until now, publicly available data on investment parameters across the EU has been fragmented and often not comparable across Member States.

With this report, ACER finalises the process of developing the [EU CONE dataset], which contains EU-wide reference values for technical and economic parameters used in electricity resource adequacy modelling. These values are built on the consultancy study commissioned by ACER and have been refined through a public consultation that compiled expert input from across the electricity sector, including system operators, generators, technology providers and industry associations. This report sets out ACER's evaluation of that feedback and explains how it informed the final dataset.

The revised dataset provides Member State-specific values for key economic parameters relevant to adequacy modelling, including capital costs, operating costs, weighted average cost of capital and additional investment potential. It covers the most relevant technologies for modelling purposes, including gas-fired turbines, batteries, gas engines and demand-side response.

The consultation confirmed broad alignment with ACER's proposed values for conventional gas technologies, while providing diverse feedback for batteries and demand-side response. Stakeholders also raised important points regarding the interpretation of additional investment potential and the treatment of weighted average cost of capital. ACER has addressed these issues in this report through targeted methodological updates, revised technical assumptions and additional guidance for interpreting and applying the values.

The final EU CONE dataset marks an important step towards a more coherent approach to adequacy assessments. Compared with previous approaches based either on scattered national studies or on uniform EU averages, the ACER dataset provides a robust balance between comparability across Member States and the reflection of national specificities. It is intended to support ENTSO-E in future editions of the European Resource Adequacy Assessment, assist Member States in the design and approval of capacity mechanisms, where relevant, and contribute to the consistent application of the Adequacy Metrics Methodology.

ACER considers this dataset a strong basis for improving European electricity system modelling, while recognising that future updates will be needed as technologies, markets and policy frameworks evolve.

1. INTRODUCTION

1.1 Background

Realistic and robust cost assumptions are essential for credible long-term electricity system modelling and planning. This is particularly evident in modelling exercises such as the European Resource Adequacy Assessment (ERAA), the results of which can directly inform expectations about future investment needs.

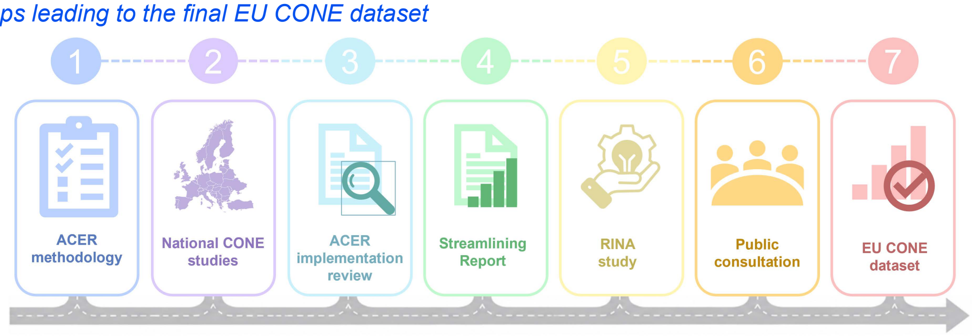
In practice, such assessments influence decisions on whether new generation capacity or flexibility resources are developed or supported, and whether existing assets are expected to remain economically viable. Because these investment choices shape the European power system over many years, inaccurate or insufficiently grounded cost inputs can have consequences that extend well beyond a single assessment cycle.

ACER's study on the implementation of adequacy metrics revealed considerable variation in national values, with some differences resulting from inconsistent implementation choices of the underlying common methodology. Following the outcomes of this study, together with the European Commission's report on Streamlining of Capacity Mechanisms and the mandate given by the European Commission to ACER to provide value of lost load (VOLL) and cost of new entry (CONE) values, ACER commissioned a study to RINA consultancy to calculate investment parameters for all Member States.

The consultancy conducted a desk research exercise resulting in a dataset[1] providing initial Member State-level estimates of both investment and operational costs for various power generation technologies and flexibility resources, such as demand response and battery storage. This dataset was subject to a public consultation to gather feedback from interested stakeholders.

This evaluation report presents ACER's analysis of the responses received to the consultation and provides the final reference EU CONE dataset. Figure 1 describes the process followed to develop the dataset.

Figure 1: Steps leading to the final EU CONE dataset



Source: ACER

[1] Incorporated directly into the Generation and storage technologies survey and the DSR survey.

1.2 Purpose and objectives

The purpose of this consultation was to ensure that the input data used in European-level electricity system modelling are robust, transparent and accurately reflect national market conditions.

Stakeholders were invited to review the data for their respective Member State(s) by:

- assessing whether the values presented in the consultation reflect current market conditions and technological developments; and
- proposing alternative values, where appropriate, supported by evidence.

1.3 Intended users and use

The economic parameters published with this report can be used by ENTSO-E to strengthen input assumptions for the European Resource Adequacy Assessment (ERAA) and by the relevant entities for national resource adequacy assessments (NRAAs), particularly in assessing the potential future deployment of adequacy resources. This dataset will also support the calculation of reliability metrics used to determine resource adequacy needs. In addition, it will assist Member States in the fast-track approval process for capacity mechanisms under the new Clean Industrial Deal State aid framework (CISAF).

The dataset contains estimated economic parameters for new power generation technologies as well as batteries and demand response, including capital costs, fixed and variable operating costs, and investment potential.

According to the ACER's Adequacy Metrics Methodology, these parameters are critical for determining the desired level of security of supply and for conducting adequacy assessments.

With a view to support a consistent, transparent and robust use of the consulted values in policy and regulatory contexts, ACER emphasises that they should be interpreted and applied in accordance with the Adequacy Metrics Methodology.

BOX 1: A NEW EU-WIDE APPROACH TO ESTABLISHING COST OF NEW ENTRY VALUES

The present study has the potential to address issues identified in previous ERAA cycles. It was observed that while national CONE studies provide valuable country-level insights, they are completed during different timeframes and often produce significantly divergent values, which limits their comparability.

This led ENTSO-E to define a single European CONE per technology in ERAA 2024 and 2025, derived as a simple average of available national CONE values. This average-CONE approach addressed the issue of comparability, yet no country-specificity was reflected, and it resulted in rather volatile parameters over time.

Through the present study, ACER takes an **EU-wide approach, providing values that offer a reliable set of parameters** calculated using the ACER-approved Adequacy Metrics Methodology. It is *well suited for establishing a dataset of CONE values that is consistent across Member States, accounts for the country specificities and reflects the stakeholder feedback*.

The ACER approach *allows the comparability of results* and *leaves room for some national particularities*. The awareness of the limits of this study is reflected in the identification of potential future improvements, allowing for updates to the input parameters in the event of changes to the underlying data.

1.4 Scope

The calculation of CONE values is limited to reference technologies that meet the two criteria required in the Adequacy Metrics Methodology:

1. **Standard technology criterion**. A reference technology should be standard. To identify whether a given candidate technology is standard, the entity calculating CONE should demonstrate that:
    - reliable and generic cost information is available for the cost components,
    - the costs of building and operating units of the technology should be of the same order of magnitude from one project to another, and
    - development of the technology is not significantly bound by technical constraints.
2. **Potential new entry criterion**. A reference technology should have potential for new entry. To demonstrate that the candidate technology is representative of possible capacity additions in the coming years, the entity calculating CONE should demonstrate that:
    - capacity representing this technology has been developed in recent years, is in process of development or is planned for development for the considered timeframe,
    - future development of this technology is allowed and is not significantly hampered by the national or European regulatory framework.

This approach ensures that only mature technologies with well-established cost structures are considered.

The survey, therefore, focuses on the techno-economic parameters and investment potential of the following technologies:

- Natural gas-fired combined cycle gas turbine (gas CCGT)
- Natural gas-fired open cycle gas turbine (gas OCGT)
- Hydrogen-fired combined cycle gas turbine (H_2 CCGT)
- Hydrogen-fired open cycle gas turbine (H_2 OCGT)
- Electrochemical utility-scale storage (batteries)
- Demand-side response (DSR)

The economic parameters analysed across these technologies are:

- Capital cost (CAPEX) [EUR/kW]: costs incurred during the development, construction, or refurbishment of a capacity resource.
- Annual fixed cost (FOM) [EUR/kW/year]: ongoing yearly costs associated with operating a capacity resource, independent of output.
- Variable cost (VOM) [EUR/MWh]: average variable operating costs over the lifetime of the resource. Fuel and CO_2 costs are excluded, as they are treated separately in adequacy assessments.
- Activation price (DSR) [EUR/MWh]: average minimum market price required to activate demand-side response over its lifetime.
- Weighted average cost of capital (WACC) [%]: pre-tax cost of capital, weighted across different financing sources.
- Additional investment potential [MW]: estimated additional capacity that could be developed by a rational investor by 2030.

For all parameters: (i) values are expressed in real terms, and (ii) estimates refer to the year 2030 and incorporate expected technological and market developments.

1.5 Survey structure

The survey conducted during the consultation gathered both quantitative and qualitative feedback on the economic assumptions proposed by ACER for selected power generation technologies, as well as batteries and demand response, across EU-27 Member States.

The survey was designed to ensure a structured and comparable collection of stakeholder views while allowing respondents to provide country-specific expertise, market evidence, and supporting details where appropriate. The structure aimed to balance comparability of responses for quantitative analysis with sufficient flexibility to capture expert judgement and national particularities.

Respondents were asked to select one or multiple EU-27 countries for which to provide feedback and one or more technologies to review. A general comment field was also available, allowing participants to provide overarching observations or propose additional technologies not included in the consultation.

For each selected technology and country combination, respondents were presented with a predefined set of economic parameters proposed by ACER in a structured table format.

For example:

Belgium – Gas CCGT

- Capital cost: 1328 EUR/kW
- Annual fixed cost: 44 EUR/kW/year
- WACC: 5.8 %
- Variable cost: 2.8 EUR/MWh
- Additional investment potential: 644 MW

For each individual value, respondents were asked to select one of the following options:

- “Broadly agree”
- “Propose correction”
- “Don’t know”

When respondents selected “Propose correction”, they were required to enter a revised numerical value. This approach ensured that disagreements with the proposed values were supported by alternative numerical estimates. Moreover, a more effective assessment of responses was achieved by encouraging stakeholders to provide concrete feedback, thereby reducing uncertainty regarding the magnitude and direction of any disagreement.

In addition, respondents were invited to provide comments in an “Additional information” textbox for each technology. This field allowed respondents to explain the rationale behind proposed corrections, including underlying assumptions, methodological considerations, national market circumstances, and references to relevant studies or data sources. The additional information provided was considered essential for interpreting the numerical responses, assessing the robustness of the proposed revisions.

A quantitative analysis was conducted on the numerical responses considering the additional information provided to justify proposed corrections.

Finally, the input collected through the general written feedback and technology-specific comment fields was assessed qualitatively and used to complement the quantitative evaluation of responses.

The survey design aimed to ensure a transparent and consistent review of ACER’s proposed assumptions across technologies and Member States. The use of standardised response categories enabled quantitative aggregation and comparison of responses, while the possibility to propose corrections and provide supporting comments ensured that stakeholders could contribute detailed expert input reflecting national market realities and evolving investment conditions.

1.6 Timeline

The public consultation on the economic parameters was launched on 27 February 2026 and remained open until 10 April 2026 after an extension on the original deadline of 27 March 2026 was requested by stakeholders.

Following the closure of the consultation, ACER carried out a detailed assessment of the input received. This included both the responses submitted through the consultation survey and views shared directly by stakeholders. ACER considered the numerical input on specific parameter values as well as the broader observations on the methodology, assumptions and the overall approach. In parallel, ACER also collected feedback from the national regulatory authorities (NRAs).

Based on the consultation responses, the bilateral stakeholder engagement and the exchanges with NRAs, the Agency revised the dataset of economic parameters. The finalisation of the dataset was subsequently carried out in cooperation with NRAs, with a view to ensuring that the resulting values are robust, transparent and suitable for use within the adequacy framework.

2. STAKEHOLDER FEEDBACK

This chapter presents the outcome of the public consultation (PC) process. It outlines stakeholder participation, summarises the feedback received (including general comments and the input on investment potential), and provides an overview of the numerical input submitted by stakeholders. It also sets out ACER's assessment of that feedback and explains how the points raised by stakeholders were addressed in finalising the dataset.

2.1 Overview of stakeholder's participation

In total, 28 stakeholders participated in the public consultation (Table 1). Of these, 26 submitted responses through the dedicated survey, while the European Association of Engines and ENTSO-E provided separate written contributions. ENTSO-E's submission included country-specific comments from six TSOs, some of which were also submitted by the TSOs through the consultation survey. In parallel, ACER also sought and received input from NRAs.

As no stakeholders requested confidentiality, all responses are published in the file "PC responses" alongside this report.

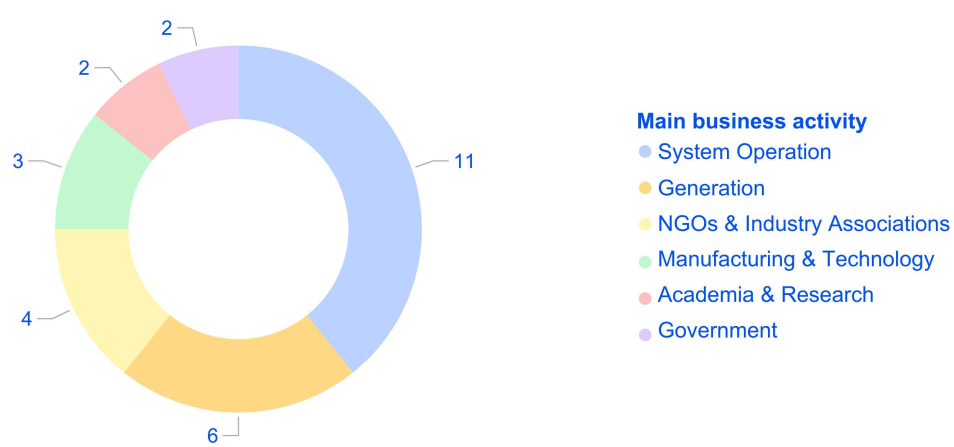
Table 1: List of stakeholders participating in the PC

Name	Main activity	Country
Amprion	System Operation	Germany
Asociación Española de Almacenamiento de Energía	NGOs & Industry Associations	Spain
Bundesnetzagentur	Government	Germany
ČEPS, a.s.	System Operation	Czechia
CEZ	Generation	Czechia
EDF	Generation	France
Edison	Generation	Italy
ELIA TRANSMISSION BEGIUM	System Operation	Belgium
ENEL Group	Generation	Italy Spain
Energieinstitut an der JKU Linz	Academia & Research	Austria
Eni Spa	Generation	Italy
ENTSO-E	System Operation	EU
EUGINE	NGOs & Industry Associations	EU
European Bitcoin Energy Association	NGOs & Industry Associations	Germany
Fingrid Oyj	System Operation	Finland

Form Energy	Manufacturing & Technology	Germany Ireland Italy Spain
GE Vernova	Manufacturing & Technology	Germany Poland
Hellenic Association of Independent Power Producers (HAIPP)	NGOs & Industry Associations	Greece
Iberdrola	Generation	Spain
Institut National de Bitcoin	Academia & Research	France
Ministry for the Environment, Energy and Public Cleanliness	Government	Malta
PSE S.A.	System Operation	Poland
Red Eléctrica	System Operation	Spain
REN	System Operation	Portugal
Siemens Energy	Manufacturing & Technology	Germany
Svenska kraftnät	System Operation	Sweden
TenneT B.V.	System Operation	Netherlands
Terna S.p.A.	System Operation	Italy

The highest level of stakeholder engagement was observed among system operators and generation companies, with 11 and 6 participants, respectively. The distribution of survey participants by sector is presented in Figure 2.

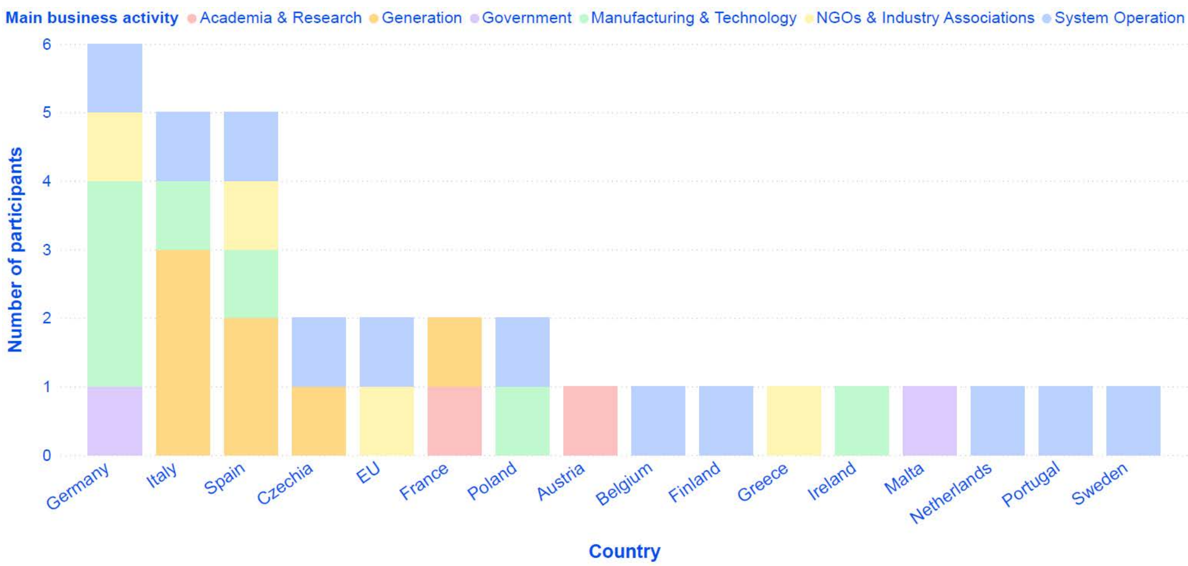
Figure 2: Distribution of public consultation participants by sector



Source: ACER

Stakeholders submitted survey responses covering one or more Member States and, as shown in Figure 3, responses were received for 15 Member States in total. In addition to the survey, ENTSO-E and EUGINE provided EU-wide feedback. ACER also engaged with NRAs throughout the process and 16 NRAs submitted written feedback for their respective Member State.

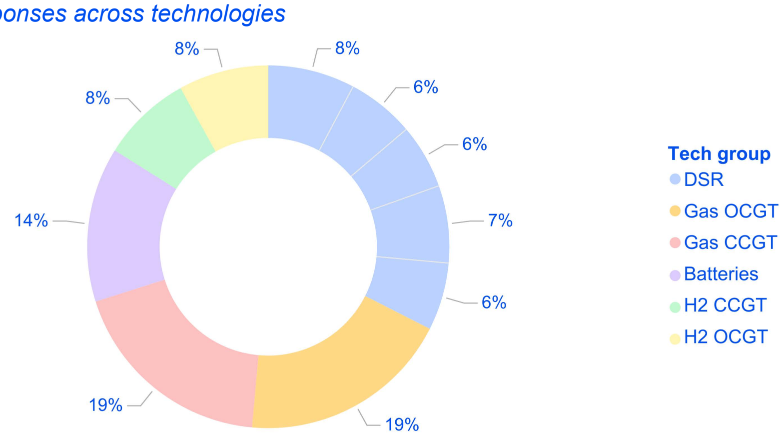
Figure 3: Public consultation feedback across Member States



Source: ACER

At least one response was received for each parameter for each of the reference technologies consulted. Excluding responses that provided no quantitative feedback, the highest level of participation was recorded for gas technologies, representing 38% of the responses received, with 19% of responses each for the CCGT and OCGT technologies. DSR technologies followed, with each of the five DSR subcategories accounting between 6 and 8% of the total responses. Batteries received 14% of the responses and the lowest participation levels were observed for H_2 CCGT and H_2 OCGT technologies, which accounted for 8% each.

Figure 4: Distribution of responses across technologies



Source: ACER

2.2 General feedback

The general feedback received, supported by specific extracts from the responses, was grouped into categories in Table 2 below. Written feedback from the stakeholders that interacted with ACER outside the survey is also included in the table (e.g., ENTSO-E).

Table 2: General feedback of stakeholders grouped by topic

Feedback	Sample supporting extracts	ACER Views
Consider lifetime extension of existing gas plants Include lifetime extension as a reference technology. Derive CAPEX and FOM relevant for extension.	Red Eléctrica: "Prolongation of existing CCGTs is considered a reference technology" ENEL Group: "11.9 GW of existing CCGT capacity reaches ... its technical lifetime", "CAPEX required for CCGT lifetime extension is ... €100,000 per MW" ELIA Transmission Belgium: "There is no information – costs about LifeTime extension options."	ACER acknowledges the relevance of extending the lifetime of existing plants, which may be particularly important in certain countries, as highlighted by the Spanish and Portuguese NRAs. While the scope of the underlying study was limited to the costs of new entry and did not cover lifetime extension or refurbishment, ACER will work with these NRAs to determine the relevant cost parameters and incorporate them into the dataset as described in Section 3.1.
New technologies proposed Include costs for combined heat and power (CHP) plants and gas engines (reciprocating internal combustion engines). Include additional technologies, namely pumped storage hydropower, iron air batteries, different configurations of thermal energy storage (TES), and biomass.	Economic parameters for new technologies received: • Iron Air Batteries: Form Energy. • Pumped Storage Hydropower: Energieinstitut an der JKU Linz and Asociación Española de Almacenamiento de Energía • Biomass CHP: Energieinstitut an der JKU Linz • Thermal Energy Storage (TES): Asociación Española de Almacenamiento de Energía Additional reference technology requests: • Combined heat and Power: Siemens Energy and CEZ • Gas engines: Fingrid Oyj and EUGINE	The consulted set of technologies was limited to reference technologies meeting the methodology's criteria across the EU for which reliable cost information can be obtained with similar order of cost magnitude between projects. The technologies should be commonly used for adequacy purposes, and a viable new investment should be identified for them. ACER agrees to include other gas-fired technologies (i.e. reciprocating engines and CHP), in addition to OCGT and CCGT. ACER notes that some of the proposed technologies (e.g. Pumped Hydro Storage) may be pertinent for individual Member States, as supported by some NRAs direct engagement with the Agency. The actions adopted to include new reference technologies are explained in section 3.1
Hydrogen fired plants are not mature enough to be treated as a reference technology	Siemens Energy: "most future H_2-power plants will be retrofits from natural gas plants", "Most future H_2 CCGTs are already included in the Gas CCGT figures", "Only for plants built after 2040/2045 you may expect 100% H_2"	Based on the feedback received from stakeholders, ACER acknowledges that 100% hydrogen-fired plants are not expected to be deployed within the study horizon. Therefore,

100% H_2-fired plants should not be considered as a reference technology within the horizon of this study	Fingrid Oyj: "Potential for 2030 should be zero" (re H_2 CCGT/OCGT) Terna S.p.A.: "[H_2 turbines] cannot be considered a sufficiently mature and standardised technology" ENTSO-E: "Hydrogen-based power generation is not a reference technology (cf. Art. 10(4) of the CONE methodology), given that no "reliable and generic cost information is available"	hydrogen-fired plants have been excluded from the reference technologies.
Differentiate batteries by storage duration and class Distinguish between multiple battery durations, beyond 4 hours. Moreover, also distinguish between utility-scale, residential, and V2G batteries. Include both MW and GWh metrics for potential.	HAIPP: "distinguish storage by duration class", "2-hour and 4-hour BESS assets" ELIA Transmission Belgium: "1h, 2h, 4h Batteries" Iberdrola: "2-, 4-, 6-, and 8-hour batteries" ELIA Transmission Belgium: "BE NRAA ... considers large-scale batteries, small residential batteries, and V2G" ENTSO-E: "would welcome the fact that economic data could be prepared for more than a single battery expansion candidate."	The study focused on utility-scale 4-hour batteries, reflecting both their relevance for system adequacy purposes and the availability of sufficiently robust data for this storage configuration. While respondents pointed to differences across energy storage technologies, ACER did not receive information that was sufficiently reliable and comparable to support the development of a more granular classification, whether by battery type, storage duration or other categories. In the future if more information becomes available, ACER may update the data set with more battery types.
Longer construction timelines for gas CCGT Consider between 4 and 6 years rather than 3 years. Include permitting, environmental approvals, land acquisition and grid connection. Reflect OEM (Original Equipment Manufacturer) backlog constraints.	TenneT B.V.: "a construction time of 4-5 years would be more realistic" Siemens Energy: "Construction time of 2.5 years [for OCGTs] is OK for normal market circumstances – today OEMs are sold out, which lead to higher construction times for the next years. ELIA Transmission Belgium: "Construction period is assumed 4 years" Enel Group: "... overall construction timelines [of gas CCGT and OCGT plants] is expected to exceed 3 years due to machinery supply lead times"	ACER noted that a broad consensus emerged that a 3-year construction period for gas CCGT is unrealistic once permitting and supply-chain delays are included. Several comments also noted that technical performance assumptions are outdated. Regarding batteries, concerns were raised on their modelling assumptions and construction time. Given the available data, the consultant was only able to establish cost parameters for four-hour battery systems, which is also the configuration commonly used for adequacy purposes. Nevertheless, ACER recognises the value of broadening the dataset in future updates to cover batteries with a wider range of storage durations. ACER has updated its assumptions for construction timelines and technical parameters in Section 3.2.
Battery construction time Different views from stakeholders on construction times for utility scale batteries.	Iberdrola: "ACER assumes a construction period of 2 years, longer than ENTSO-E's default assumption of approximately 1 year." EDF: "the construction time assumption of 2 years seems too optimistic."	
Higher efficiency for CCGT and OCGT Reflect higher efficiencies of modern plants.	Siemens Energy: "average block size of new CCGTs to be around 800-900MW, with efficiencies exceeding 63%." Siemens Energy: "average block size of new OCGTs ... around 400-600MW, with efficiencies exceeding 41%." ELIA Transmission Belgium: "The most efficient ('new) CCGTs in Belgium they have an efficiency higher than 57% (61%)." ELIA Transmission Belgium: "The most efficient ('new) OCGTs in Belgium they have an efficiency higher than 40% (42%)."	

Higher efficiency for batteries and consideration of degradation Explicitly model degradation. Reassess round-trip efficiency assumptions.	ENEL Group: “ACER does not indicate battery degradation” Iberdrola: “cycle efficiency assumption of 92%”	
DSR is not mature enough to be treated as a standard reference technology Avoid treating DSR as a standard reference technology in all countries. Recognise country-specific maturity and deployment levels.	Red Eléctrica: “DSR ... is still at an early stage of development.”, “there are no cost data records that can be regarded as generic and representative.” Terna S.p.A.: “DSR is not a reference technology.” ENTSO-E: ”DSR is not a reference technology (cf. Art. 10(4) of the CONE methodology), given that no “reliable and generic cost information is available”.”	ACER notes the concerns raised regarding the maturity of DSR and the extent to which its deployment may depend on national circumstances. These considerations may affect the representativeness of fully coordinated assumptions applied across the EU. ACER also recognises that stakeholders suggested that a more granular approach could be explored, including differentiation by sector, activation duration, and flexibility characteristics. On the other hand, proposals were made to combine residential and commercial DSR categories and to reduce the number of industrial DSR bands. ACER has taken this feedback into account in the final approach described in Section 3.6. In the revised dataset, DSR bands have been consolidated, reflecting both stakeholder feedback and the current limits of the available data. These limitations affect the viability of a more granular classification that would produce sufficiently robust and comparable results across Member States. More generally, ACER recognises the need for further studies and is already exploring how this topic can be developed in future work.
Better segmentation and categorisation of DSR Segment DSR by customer type and activation profile. Include duration and frequency assumptions. Include bitcoin mining as a category.	ENEL Group: “It would make sense to model residential DSR in several cost bands.” EDF: “categorization ... by activation duration and frequency of activation is missing.” Iberdrola: “duration and frequency of ... activations should differ for each ... category.” Fingrid Oyj: “assumptions regarding DSR source and availability ... should be ... available.” European Bitcoin Energy Association: “Industrial Bitcoin mining ... should be assessed on its own flexibility profile”	
Changes to DSR categories Combine residential and commercial DSR into a single category because both are mainly driven by the same flexible technologies (electric heating and EVs). Combine the industrial DSR into a single industrial band based on observed SRAD auction data.	TenneT B.V.: “Proposal to merge category with residential to get to a single value based on the demand from electric heating and EVs, which are the two main categories from which to expect flexible behaviour” Red Eléctrica: “We therefore suggest that only one DSR industrial band is considered ...”	
Clarification needed on WACC The reason why supply chain-related risks elevate WACC for battery is unclear. The market design underlying computed WACC is unclear.	ENTSO-E: “It should be clarified if [battery-specific] supply chain-related risks have been reflected in the WACC and, if so, on what methodological basis.” ENTSO-E: “WACC should not be considered as an agnostic parameter and could differ depending on the presence or absence of long-term capacity mechanisms.”	ACER recognises the need to clarify the assumptions underlying WACC values resulting from the consultancy study. As pointed out by stakeholders, ACER considers that supply-chain related risks for batteries are more appropriately reflected outside WACC, through separate

	TERNA: "WACC is dependent on the contractual arrangements (merchant vs long-term contract). When a Capacity Market is not present, WACC would be significantly higher, because the CoE, CoD and leverage depend on the project bankability and the predictability of future cash flows"	parameters designed to capture investment-related risks. This allows for a clearer distinction between the different sources of uncertainty affecting investment decisions. Regarding the underlying market context, where relevant, WACC values should be understood to reflect a framework where capacity markets are in operation. The revised approach to WACC is further clarified in Section 3.4.
Alignment with adequacy studies and national policies Ensure consistency between the data used in ERAA with that of national adequacy studies. Align the assumptions in the CONE study with ERAA. Use national CONE values for ERAA when they represent the most up-to-date information.	Amprion: "it should be ensured that NRAAs and ERAA are applying those consistently." ELIA Transmission Belgium: "the Belgian data in ERAA must be coherent with the data used in the relevant national adequacy studies." Iberdrola: "physical and economic parameters of batteries assumed by ACER are not the ones handled by ENTSO-E" REN: "We strongly advise keeping the Portuguese values coming from [the national CONE] study as main input for ERAA 2026 since it represents the most up-to-date data."	ACER agrees that adequacy assessments should be based on a consistent set of assumptions. This is without prejudice to the national studies updating those assumptions with more recent or detailed information, where properly justified. In ACER's view, the present study has the potential to address issues identified in previous assessment cycles. In particular, national CONE studies were completed at different times and often produced significantly divergent values, which limited their comparability. This led ENTSO-E to rely on single harmonised CONE values for all Member states irrespective of national differences in the ERAA 2024 and 2025. In this context, incorporating existing national CONE values directly into the final dataset developed through this study would not be appropriate, as it would not address the underlying objective of establishing a more consistent, pan-European dataset for the adequacy framework. For subsequent ERAA editions, ACER recommends ENTSO-E to use CONE values from this study to improve the robustness and representativeness of the results.
Methodology Clarification Improve transparency of assumptions, methodology, and data sources Methodological consistency across country-specific values is needed for modelling purposes	ENTSO-E: "assessing the more detailed methodological insights file some questions arise regarding some lack of explanations on methodological decisions." HAIPP: "further clarification on the underlying data source and allocation methodology ... would be useful." TenneT: "it is unclear whether elements such as Interest During Construction or grid connection costs are included in the CAPEX estimates." Terna S.p.A.: "the reported sources are very generic, outdated and based on desktop literature, with no apparent link between the sources and reported values."	ACER acknowledges the concerns raised regarding the source file shared during the consultation. This file was compiled as part of the consultant's initial desk research to develop a broad understanding of the investment environment across the EU. It captured the range of sources reviewed during the familiarisation phase, rather than the basis for the final calculation. The consulted values were derived in accordance with the approach outlined in the methodological insights document published along the consultation to ensure consistency and comparability across Member States.

	ENTSO-E: “Mixing pan-European and national references for some data raises concerns regarding the consistency, coherence and comparability of the resulting dataset.”	ACER also notes the stakeholders' comments regarding the information supporting the values presented in the public consultation. This assessment of the public consultation aims not only to evaluate the feedback received but also clarify the consultant’s approach underpinning the final values where questions emerged. To this end, Section 3 provides a detailed description of the assessment process and includes additional methodological clarifications, including on the estimation of the WACC, method to derive DSR-related parameters, the treatment of additional investment potential and the quantitative method to assess the numerical responses.

2.3 Feedback regarding additional investment potential

Feedback received from stakeholders on the additional investment potential is summarised in Table 3. Based on these comments, ACER provides a description of its revised approach in Section 3.3.

Table 3: General feedback of stakeholders regarding the additional investment potential

Feedback	Sample supporting extracts	ACER Views
Resource potential The feedback on investment potential reflected widespread uncertainty on this topic, including diverging interpretations. Many stakeholders sought a better understanding of the concept. It was also highlighted that the potential is not only used to set the reliability standard (RS) but also has consequences for the power system modelling.	ENTSO-E: "Limitations applied to the EVA model should only stem from technical limitations (e.g. lack of hardware / human resources to build new units) or policy restrictions." TenneT: "It is not clear to us on what basis this additional potential has been established." EDF: "The information provided regarding the calculation of the Additional Investment Potential is not sufficient." Amprion: "Limitations applied to the model might rather stem from technical limitations ... or policy restrictions."	In ACER's understanding the potential - as referred to in the Adequacy Metrics Methodology - relates to the ability to invest in various mature technologies to fill the adequacy gap and the corresponding market opportunity as seen by investors. This potential gives the theoretic upper bound that is applicable for the calculation of the RS. Given the sensitivity of the power system modelling tools to even minor differences in investment costs, as observed in the ERAA's EVA, the adequacy models may need to apply additional constraints to the notional potential calculated for RS to reflect its limitations. Taking the responses received into consideration, ACER provides a description of investment potential in Section 3.3.
Natural-gas technologies and battery potential Stakeholder feedback regarding gas-fired and battery potential was highly heterogeneous, reflecting different interpretations of the concept of "additional investment potential" and the underlying assumptions used to define its scope and scale. Consequently, stakeholders either proposed significant increases and decreases in the consulted values or considered it not possible to estimate the actual potential.	Siemens Energy: "Germany needs to step out of coal generation until 2038. In order to do so, 20-25GW of new gas fired capacity is to be built." TenneT B.V.: "It does not seem likely that an additional 2 GW of gas CCGTs would be built in the Netherlands by 2030. We suggest setting this to zero." Svenska kraftnät: "a potential amounting to 217 MW seems to be too low." HAIPP: "The Greek NECP confirms policy support for the deployment of BESS. It projects 4,325 MW of battery storage by 2030." Iberdrola: "the 18 GW figure [for the battery investment potential in Spain] appears unrealistic"	ACER has adjusted its approach to the additional potential of gas-fired and battery capacities in light of stakeholder feedback. In particular, several stakeholders understood the values consulted on as a forecast of future build-out, whereas the underlying methodology asks for a theoretical upper bound on the capacity that could be deployed if needed. To avoid any fixed numerical value being read as a projection of likely deployment, ACER does not apply a cap to additional gas-fired capacity beyond the period constrained by construction lead times. The stakeholder feedback highlighted that the issue was less about the magnitude itself, but the fact that any fixed value may be understood as an estimate of likely deployment rather than as a theoretical ceiling. In that sense, assigning a cap would risk perpetuating the same ambiguity.

		This approach reflects the nature of both technologies, which are mature, easy to deploy and, unlike some other technologies, are less affected by any technological limits on deployment. Instead, such mainstream reference technologies get built at scale when the system needs them, particularly under supply scarcity. The proposed approach is described in detail in Section 3.3.
Demand response potential Stakeholders found it challenging to provide numerical estimates of potential for each of the consulted DSR categories, covering the three industrial bands, residential DSR and commercial DSR. The resulting numerical responses were limited and heterogeneous.	TenneT B.V.: "Industrial demand side response has a much bigger potential than indicated here." PSE: "Scale of DSR looks to be overestimated." ENEL Group: "The additional investment potential seems low ... reasonable to assume that at least 2 GW of Industrial DSR would be available in Italy ... probably considerably more ..."	ACER recognises the challenges of estimating DSR potential across Europe given the significant national specificities and different levels of market development. The values consulted, based on the best currently available data, are therefore retained as the default values. Further details on the consultant's methodology and assumptions are provided in Section 3.3. Given these challenges and the strong national specificities of the DSR industry, ACER will further assess the default values through a follow-up study and gather additional input from NRAs as national markets develop. This may inform future adjustments to the default values.

2.4 Numerical feedback

The survey aimed to collect feedback on the estimated economic investment parameters and potential capacity expansion of different resources and was completed by 24 participants.

As explained in Section 2.2 and 3.1, hydrogen-fired technologies have been excluded from the reference technologies. For this reason, the numerical feedback for H_2 CCGT and H_2 OCGT is not reported. The feedback for the other technologies is summarised in the tables in this section, showing both the number of responses per type (i.e. “don’t know”, “broadly agree” and “proposed correction”) and the total number of addition comments related to those responses for each evaluated technology and parameter.

The full set of responses is provided in detail in Appendix 1.

Table 4: Gas CCGT distribution of responses

Parameter	n. “don’t know”	n. “broadly agree”	n. “proposed correction”	n. Related comments
CAPEX	1	10	8	5
FOM	2	9	5	3
VOM	3	7	4	2
WACC	2	8	8	5
Potential	10	3	3	9

Table 5: Gas OCGT distribution of responses

Parameter	n. “don’t know”	n. “broadly agree”	n. “proposed correction”	n. Related comments
CAPEX	1	10	8	7
FOM	2	9	5	2
VOM	2	7	5	3
WACC	2	8	8	6
Potential	9	3	4	9

Overall, the results indicate relatively high levels of agreement on the estimated values for conventional generation technologies (gas CCGT and gas OCGT), while also a significant number of proposed corrections, particularly for CAPEX and WACC was received. For both gas CCGT and gas OCGT, ten participants broadly agreed with the estimated CAPEX values, while eight participants suggested corrections. The relatively high number of comments associated with CAPEX (five for CCGT and seven for OCGT) confirms that this parameter was considered important and subject to discussion. Similar patterns were observed for WACC, where eight participants proposed corrections for both technologies, indicating that financing assumptions are considered sensitive and potentially dependent on market conditions or methodological choices.

Operational cost parameters (FOM and VOM) for gas technologies received more consistent feedback. Most participants either broadly agreed or did not propose corrections, and the number of comments was limited, which indicates that these assumptions are generally more consistent compared with investment costs and financial parameters. The estimated potential capacity expansion for gas technologies received less clear feedback, with many participants selecting “don’t know” (ten for CCGT and nine for OCGT) and a high number of related comments. This suggests that the concept of future investment potential was not completely clear or easy to assess for stakeholders that still considered it relevant.

Table 6: Batteries distribution of responses

Parameter	n. “don’t know”	n. “broadly agree”	n. “proposed correction”	n. Related comments
CAPEX	2	5	8	7
FOM	2	6	8	5
VOM	3	7	1	0
WACC	5	3	5	4
Potential	9	2	3	6

For batteries, the stakeholder feedback shows a lower level of alignment with the consulted values than for gas technologies. Both CAPEX and FOM received a relatively high number of proposed corrections (eight each), while five and six participants broadly agreed with the consulted estimates. Notably, all the proposed values for CAPEX and FOM were higher than the consultant's values. This suggests that stakeholders anticipate a slower decline in battery costs than originally assumed by the consultant, reflecting a more conservative view of the cost evolution of this rapidly evolving technology. VOM, which was set at 0 €/MWh for all countries, received the strongest level of agreement among the battery parameters, with seven participants broadly agreeing and only one proposing a correction, limited to 1 €/MWh. By contrast, WACC and potential expansion were associated with greater uncertainty, as reflected by the higher number of “don't know” responses.

Table 7: DSR distribution of responses on five DSR technologies

Parameter	n. “don’t know”	n. “broadly agree”	n. “proposed correction”	n. Related comments
CAPEX	22	3	13	21
FOM	19	3	15	10
Activation	20	3	15	13
WACC	13	6	10	9
Potential	28	8	30	10

Since the DSR table combines feedback across five different DSR technologies, it received a higher number of responses than the tables for individual generation technologies. Overall, DSR exhibits the highest level of uncertainty among all the assessed resources. A large proportion of participants selected "don't know", particularly for potential expansion (28 responses), CAPEX (22 responses), and activation costs (20 responses), indicating the difficulty stakeholders faced in providing representative numerical estimates that account for the expected evolution of DSR technologies up to 2030.

The number of "broadly agree" responses was relatively low across all parameters, suggesting that the originally consulted values require further refinement. In addition, the large number of comments indicates that several assumptions would benefit from further clarification and additional stakeholder engagement. CAPEX attracted the greatest number of comments, with many stakeholders stating that the consulted values were overestimated, a view that was also explicitly supported by ENTSO-E in its written submission.

In general, the survey results show that consulted economic parameters for gas technologies are relatively well understood and are in line with stakeholder view, although some refinement of investment and financing assumptions may be needed. For the rapidly evolving battery technology, the related assumptions are less widely agreed due to different views about its technological development, while DSR parameters show the highest uncertainty and variability.

The high number of proposed corrections and comments for several parameters indicates that the survey successfully identified areas where the estimated values may require further validation, improvement, or more detailed explanation. Across all technologies, the additional investment potential is the parameter receiving the highest number of “don’t know” responses.

The analysis of the quantitative and qualitative feedback resulted in the actions described in Section 3.

3. METHODOLOGICAL APPROACH

This chapter describes the actions undertaken by ACER to address and incorporate the feedback received during the public consultation process, leading to the development of the final dataset. These actions include both qualitative approaches to address the general comments submitted by stakeholders and quantitative approaches to evaluate the numerical responses. Throughout the process, ACER worked closely with the NRAs, who provided feedback on the methodology adopted and the final results.

3.1 Reference technology identification

The reference technologies are defined as those able to provide resource adequacy benefits, as described in the Adequacy Metrics Methodology. They should be standard technologies (for which it is possible to identify reliable and generic cost information) with potential for new entry.

The public consultation initially considered five reference technologies: gas CCGT, gas OCGT, batteries, H_2 CCGT, H_2 OCGT, and DSR, with DSR further divided into five subcategories. Based on the consultation responses and additional evidence collected during the assessment, ACER revised the list of reference technologies to ensure that it provides the most representative set of technologies for resource adequacy assessments.

The final set of reference technologies comprises:

- Gas CCGT
- Gas OCGT
- Batteries
- CHP gas engine
- Gas engine
- DSR (grouped into two subcategories: industrial and non-industrial).

The rationale for these updates is described below.

Exclusion of hydrogen-fired power plants. Stakeholders questioned the plausibility of H_2 CCGT and H_2 OCGT as reference technologies in the near- to medium-term horizon. As explained in Section 2.2, several respondents recommended either assigning zero additional investment potential to these technologies or excluding them altogether, arguing that 100% hydrogen-fired power plants at the scale required for adequacy purposes within the relevant assessment horizon is unrealistic. Consequently, ACER decided to remove H_2 CCGT and H_2 OCGT from the list of reference technologies.

Revision of DSR categories. The public consultation assessed DSR through five separate subcategories. Following the assessment of the responses, ACER concluded that a simplified classification better reflects the available evidence. Consequently, DSR has been consolidated into two categories: industrial and non-industrial. The rationale for this decision is presented in Section 3.6.

Inclusion of gas engine and CHP gas engine technologies. As outlined in Section 2.2, a number of stakeholders highlighted the important contribution of gas engine and CHP technologies to security of supply in their respective Member States. Furthermore, the European Engine Power Plants Association (EUGINE) submitted comprehensive technical parameters, country-specific economic data and estimates of additional investment potential for two gas engine configurations: CHP gas engines and gas engines. ACER, therefore, decided to include both among the reference technologies. The parameter values used in this study are based on the data provided by EUGINE, following ACER's review and validation by NRAs.

In addition to these EU-wide reference technologies, in future updates ACER intends to explore the introduction of **country-specific reference technologies,** where justified by national conditions. Drawing on input from NRAs, ACER will, in particular, examine the possible inclusion of parameters for:

- **Lifetime extension of gas plants**, particularly highlighted for Spain and Portugal.
- **Pumped-storage hydropower (PSH)**, notably in the case of Austria.

As a next step in considering lifetime extension of gas plants and new PSH capacity, ACER will engage with NRAs proposing specific investment parameters for their respective Member States and will assess how these values can be incorporated into the EU CONE dataset to ensure consistency of assumptions and methodology. ACER will also consider further proposals from NRAs on additional technologies and any necessary adjustments to parameters, with a view to reviewing the CONE dataset in H1 2027.

3.2 Updates to technical parameters

ACER also consulted on a set of EU-wide technical parameters for each identified reference technology. Most of these parameters are required for the final calculation of CONE. They include the technology type (e.g., lithium-ion for batteries), output power in MW, efficiency (e.g., round trip efficiency for batteries), lifetime and construction period.

Stakeholders proposed updates to the originally consulted technical parameters through the general comments, as outlined in Table 2. Relying on that feedback, ACER applied the following changes to the proposed parameters:

Table 8: Updated values for technical parameters

Technology	Parameter	Original value	New updated value
Gas CCGT	Net efficiency [%]	57	62
Gas CCGT	Construction period [years]	3	4
Gas OCGT	Net efficiency [%]	40	41
Batteries	Round trip efficiency [%]	85	92

3.3 Additional investment potential analysis

The potential for an additional capacity resource is a parameter in the calculation of the reliability standard. As described in the Adequacy Metrics Methodology, for each reference technology, the entity calculating CONE shall calculate the potential for additional capacity resource, by estimating how much additional capacity could reasonably be added by rational investors within the considered geographic area for the considered timeframe. Moreover, it should be demonstrated that the candidate technology is representative of the capacity likely to be added in the coming years, by showing that:

- capacity representing this technology has been developed in the recent years, is in process of development or is planned for development for the considered timeframe; and
- future development of this technology is allowed and is not significantly hampered by the national and European regulatory framework, such as policies and targets.

BOX 2: WHAT IS THE ADDITIONAL INVESTMENT POTENTIAL?

Focusing on an energy system in a specific region and timeframe, the *additional investment potential* shows **the scale of the opportunity for investors to add capacity** of a certain type of technology. It should consider the impact of related national and European policy and regulatory framework.

This potential is not a prediction of the future, but rather a **theoretical description of what is feasible** if the necessary conditions are in place.

In the public consultation, ACER consulted numerical values of investment potential for all the reference technologies for target Year 2030. Those values were derived from a technology-specific method used by RINA consultancy.

Stakeholder feedback highlighted differing interpretations of investment potential and the significant influence of the study time horizon on the resulting values. In light of these comments and the definition of additional investment potential set out above, ACER has revised the approach used to derive potential for the reliability standard calculation. The revised approach is intended to better reflect the theoretical nature and specific purpose of setting the reliability standard. This resulted in dividing the reference technologies into two categories:

1. **Mainstream reference technologies** (i.e., gas CCGT, gas OCGT, batteries). These technologies are already deployed at scale in several countries and are supported by established supply chains. A key point raised in the stakeholder feedback was that construction lead times materially constrain the amount of new capacity that could be expected within a given target year. ACER agrees with this point and therefore proposes an approach under which, for reliability standard purposes, mainstream technologies are assumed to have enough potential to cover adequacy gap in question, from the first target year following the applicable construction period. This approach reflects the fact that the exercise is designed to establish a reference technology for adequacy purposes. On that basis, and unless constrained by European or national policy or targets, mainstream

technologies are assumed to have sufficient potential to meet the relevant adequacy gap once their construction lead time has passed.

Based on the relevant national policies, the potential for gas CCGT and gas OCGT in Spain and France is set to zero.

2. **Additional reference technologies** (i.e., DSR, CHP gas engine, gas engine). For emerging or less developed technologies, such as DSR, and technologies deployed at a smaller scale, such as reciprocating engines, the potential cannot be considered unlimited for the purpose of the reliability standard. The time horizon is an important factor, as it directly affects the amount of additional capacity that can realistically be deployed within the period considered. Accordingly, the potential for these technologies is assessed for the 2030 Target Year.

   Based on this approach, ACER has established numerical potential values for DSR and reciprocating engines. The DSR values derived by RINA consultancy were consulted and revised as described in Section 3.6. The values for reciprocating engines were derived from stakeholder feedback and subsequently reviewed by ACER. Given the strong dependence of the potential of these technologies on national circumstances, the values resulting from the coordinated EU-wide assessment are considered default values. NRAs may propose updates to ACER where national circumstances justify a revision, drawing on their detailed knowledge of the relevant national context. Any proposed updates should remain consistent with the Adequacy Metrics Methodology.

   If gas CORP and hydro pumped storage are added as reference technologies for specific countries in the next steps, as described in Section 3.1, their additional investment potential should be defined using the same approach applied to the other additional reference technologies.

Stakeholder feedback also highlighted some uncertainty regarding the reference system against which additional investment potential should be assessed. ACER clarifies that, for the purpose of the reliability standard calculation, additional investment potential always refers to the capacity that could be deployed in addition to the capacity already expected to be installed in the relevant target year.

Regarding the outcome of his study, the treatment of the potential values differs depending on the technology and the methodology used to derive them:

- DSR: the values represent the total cumulative potential that could be deployed by 2030. The capacity already expected to be installed by 2030 must, therefore, be deducted before the remaining potential is used in the reliability standard calculation.
- Reciprocating engines: the values derived in this study already represent the additional capacity above the projected installed capacity in 2030. They can therefore be directly used in the reliability standard calculation.

BOX 3: ADDITIONAL CONSIDERATIONS ON INVESTMENT POTENTIAL

The reference system against which the potential is defined

For the purpose of the reliability standard calculation, the additional investment potential always refers to the capacity that could be deployed in addition to the capacity already expected to be installed in the relevant target year.

Relation between the potential defined for calculating the RS and the one used in adequacy assessments (ERAA/NRAA)

The potential for RS may be constrained when used for a modelling exercise (like the ERAA's EVA) to account for computational limitations and the sensitivity of power system models to small variations in investment parameters.

3.4 WACC specific case

As defined in the Adequacy Metrics Methodology, the WACC represents the cost of capital (before corporate income taxes are applied) of a business firm in which each category of capital is proportionally weighted. All sources of capital, including common stock, preferred stock, bonds and any other long-term debt, are included in a WACC calculation. It shall represent the minimum rate of return required by fund providers (shareholders and/or creditors) to finance investment in the reference technology in the considered geographic area and shall be based on transparent market data. Where relevant and upon availability of robust data, the methodology indicates that the entity calculating CONE shall calculate a different WACC for each reference technology (or specific group of reference technologies) in order to account for differences in risks.

The values of WACC presented in the public consultation were derived by the ACER consultancy study, based on the Guidelines set out in Annex 2 of the Adequacy Metrics Methodology. Accordingly, the WACC is defined as follows:

$$WACC = \frac{1 + [CoE\ \times \frac{1-g}{1-t} + CoD\ \times g]}{1+i} - 1$$

where:

- CoE represents the cost of equity;
- CoD represents the cost of debt;
- g represents the gearing;
- t corresponds to tax rate;
- i represents the long-term inflation rate of the Euro zone.

The variables in the formula were derived by the consultant using sector-specific[2] and country-specific[3] reference datasets from Stern updated in 2026. Apart from batteries, for each country, the resulting WACC values were assumed to be identical across all reference technologies, as they belong to the same sector. Higher WACC was assigned to batteries to reflect an additional risk associated with supply chains that are highly dependent on imports.

The methodology was designed to reflect the investment conditions associated with the potential implementation of a Capacity Mechanism where necessary to meet the applicable reliability standard. In this respect, it took into account the expectations of investors operating in the relevant sector, who may reasonably consider the potential availability of a Capacity Mechanism when assessing future investment conditions and developing their business plans. Accordingly, the resulting parameters reflected the investment framework relevant to reliability-driven capacity procurement and should not be interpreted as a WACC applicable to assets operating under fully merchant market conditions.

Following the assessment of the consultation feedback, ACER notes that stakeholders providing country-specific feedback consistently proposed applying the same WACC across all technologies, including batteries. As also highlighted by stakeholders, ACER considers that the additional risk associated with battery supply chains should not be reflected through the WACC, which represents the standard cost of capital. Where relevant, such technology-specific risks should instead be captured through the technology-specific hurdle premium, which, together with the WACC, determines the final technology-specific hurdle rate. On this basis, ACER has decided to **apply the same WACC to all identified reference technologies**.

The reference WACC values applied to all other reference technologies (DSR, batteries, CHP gas engines and gas engines) correspond to those of gas CCGT and gas OCGT, updated following the public consultation using the mean shift method described in Section 3.5. These two technologies received the highest number of responses during the public consultation and resulted in identical WACC values. This reflects their greater maturity and wider deployment relative to the other reference technologies, and provides a more comprehensive and robust evidence base on investor expectations and financing conditions.

In response to stakeholders' requests for clarification on whether the WACC values delivered by the consultant were nominal or real, ACER notes that the consulted WACC values were presented in nominal terms as the inflation was set to zero. To ensure comparability in the quantitative assessment described in Section 3.5, all WACC values from stakeholder responses that were expressed in real terms were converted into nominal.

ACER first assessed whether the numerical responses submitted by stakeholders were expressed in nominal or real terms:

- When stakeholders provided additional information clarifying the basis of the reported value, the WACC was considered according to the terms specified. For values sourced from NRAAs, the WACC was assumed to be expressed in real terms.

[2] Aswath Damodaran, NYU Stern, WACC Europe.
[3] Aswath Damodaran, NYU Stern, Country Default Spreads and Risk Premiums.

- When no additional clarification was provided, the values were assumed to be expressed in nominal terms, as this represents the standard convention for expressing WACC in corporate finance and investment valuation practices.

Subsequently, all stakeholder responses expressed in real terms were converted into nominal using a long-term Euro area inflation rate of 2%. The conversion was performed according to the following formula:

$$WACC_{nominal} = (1 + wacc_{real}) \times (1 + i) - 1$$

Table 9 below summarises the alignment of all numerical responses (which are identical for gas CCGT and gas OCGT technologies) to nominal WACC values. The table also reports the accompanying stakeholder comments used to determine whether each reported value was originally expressed in real or nominal terms.

Table 9: Proposed numerical values of WACC for gas fired power plants

Company	Country	WACC real	WACC nominal	Comment
TenneT B.V.	Netherlands	3.1%	5.2%	"the assumed WACC by the Dutch government is currently 5.2% / 3.1% (nominal/real)"
REN	Portugal	-	8%	-
Elia transmission begium	Belgium	4.25%	6.34%	"Reference WACC from BE NRAA is 4.25%"
Svenska kraftnät	Sweden	6%	8.12%	"We assume 6% real wacc i.e. roughly 8% nominal in our long term electricity modelling."
GE Vernova	Germany	-	8%	-
GE Vernova	Poland	-	8%	-
Terna S.p.A.	Italy	-	12%	-
Edison	Italy	-	10%	-

For clarity, the final dataset reports the updated nominal WACC values derived using the mean shift method and the corresponding real WACC values, calculated by applying a 2% long-term inflation rate.

3.5 Evaluation of numerical feedback

The numerical feedback on the investment parameters was incorporated using a mean shift method (with direction correction for conflicting responses) applied to the following consulted investment parameters:

- Gas OCGT CAPEX, FOM, VOM and WACC;
- Gas CCGT CAPEX, FOM, VOM and WACC; and
- Battery CAPEX, FOM and VOM.

The volume of numerical feedback responses received was not homogeneous across the consulted countries. For 14 countries, at least one value was provided for one parameter and one technology. Given the limited geographical coverage of the available data, a mean-shift approach was considered the most appropriate method to incorporate the feedback received into an EU-wide assessment.

The approach consists of the following main steps:

1. Data compilation through survey
2. Cleaning outliers and extreme values
3. Average percentage change computation
4. Converting to absolute variation
5. Implementation of mean shift variation and handling conflicting responses

Those steps are explained below and are showcased with the example of gas CCGT FOM.

1. Data compilation through survey

In the consultation, stakeholders responded to the survey with either “Don’t know”, “Broadly agree” or “Propose correction”, for which they were asked to provide a proposed value and accompanying comment to justify their position. The “Don’t know” responses do not provide quantitative feedback, hence they have been excluded from the next steps. The remaining responses were compiled for analysis.

Responses received for gas CCGT FOM are shown in the table below.

Table 10: Responses received for gas CCGT FOM [€/kW/year]

Company	Main business activity	Country	Gas CCGT FOM Consulted	Gas CCGT FOM - Response	Gas CCGT FOM Proposed	Comment
Siemens Energy	Manufacturing & Technology	Germany	38	Propose correction	20	
Bundesnetzagentur	Government	Germany	38	Broadly agree	-	
Hellenic Association of Independent Power Producers (HAIPP)	NGOs & Industry Associations	Greece	39	Broadly agree	-	
REN	System Operation	Portugal	36	Propose correction	17	
Elia Transmission Belgium	System Operation	Belgium	44	Propose correction	28	"Value for a 500MW CCGT FOM seems rather 28 - 32 EUR/kW/yr (EUR 2024) according to

						BE NRAA so value 44 EUR/kW/year seems too high…"
Eni Spa	Generation	Italy	40	Broadly agree	-	
Fingrid Oyj	System Operation	Finland	36	Broadly agree	-	
Svenska kraftnät	System Operation	Sweden	37	Broadly agree	-	
PSE S.A.	System Operation	Poland	34	Propose correction	64	"The proposed definition of the “annual fixed costs” parameter should be amended to also include the gas connection tariff…"
ČEPS, a.s.	System Operation	Czechia	33	Propose correction	40	"The CAPEX and operational costs are unrealistically lower than elsewhere."
Edison	Generation	Italy	40	Broadly agree	-	
ENEL Group	Generation	Italy	40	Broadly agree	-	
Ministry for the Environment, Energy and Public Cleanliness	Government	Malta	36	Broadly agree	-	
Energieinstitut an der JKU Linz	Academia & Research	Austria	35	Broadly agree	-	

2. Cleaning outliers and extreme values

Stakeholder responses from the consultation were first screened for methodological outliers. These outliers were identified where the description provided by the respondent deviated from the definition of the parameter as specified in the Adequacy Metrics Methodology. These outliers were completely excluded from the analysis.

The analysis of the gas CCGT FOM responses identified one methodological outlier. The stakeholder indicated that the reported FOM value, which was significantly higher than the other responses, also included the gas tariff. In accordance with ACER's methodology, gas costs should not be included in FOM.

For all other parameters analysed, only one additional methodological outlier was identified. This concerned the VOM values for gas CCGT and gas OCGT, where the stakeholder included fuel costs in the reported values.

After eliminating those outliers, the next screening step was to identify extreme values for each parameter and each technology. These corresponded to the highest and lowest percentage difference between the values proposed by stakeholders and ACER’s consulted ones.

The percentage difference was computed as follows:

$$Percentage\ difference_{p,t,i} = \frac{(Proposed_i - Consulted_i)}{Consulted_i} \times 100\%$$

where, for each response i, parameter p and technology t:

- $Proposed$ is each value proposed by stakeholders (equal to $Consulted$ when the response was 'broadly agree'); and
- $Consulted$ is the value proposed by ACER in the consultation for each country.

For 'broadly agree' responses, the percentage difference was set to zero. When the lowest or highest value is represented by 'broadly agree' response, is randomly selected one of them as extreme value.

These values were excluded from the 'average percentage difference' computation but were maintained in the dataset. Table 11 shows the minimum and maximum percentage difference values excluded from gas CCGT FOM.

Table 11: Extreme values (i.e. maximum and minimum percentage difference) identified for gas CCGT FOM

	Gas CCGT FOM Proposed	Percentage difference	Country
Minimum	17	-52.8%	Portugal
Maximum	40	21.2%	Czechia

3. Average percentage difference computation

For every parameter and technology, the average percentage difference was calculated after cleaning outliers and extreme values.

The average percentage change was calculated as follows:

$$Average\ percentage\ change_{p,t} = \frac{\sum_{i=1}^{n} Percentage\ change_{p,t,i}}{n}$$

where, for each parameter p and technology t:

- $Average\ percentage\ change$ is the average of the percentage change for all proposed values excluding outliers and extreme values;
- $Percentage\ change$is computed as described above; and
- n is the number of responses received excluding outliers and extreme values.

In the case where more than one response was received per country, each proposed value was counted separately.

As shown in Table 12, the percentage difference for gas CCGT FOM was calculated for each proposed value (and set to zero for 'broadly agree' responses). The resulting average percentage difference amounts to -7.61%.

Table 12: Percentage difference calculation for gas CCGT FOM

Company	Country	Gas CCGT FOM Consulted	Gas CCGT FOM - Response	Gas CCGT FOM Proposed	Percentage difference
Siemens Energy	Germany	38	Propose correction	20	-47.4%
Bundesnetzagentur	Germany	38	Broadly agree	-	0%
HAIPP	Greece	39	Broadly agree	-	0%
Elia Transmission Belgium	Belgium	44	Propose correction	28	-36.4%
Eni Spa	Italy	40	Broadly agree	-	0%
Fingrid Oyj	Finland	36	Broadly agree	-	0%
Svenska kraftnät	Sweden	37	Broadly agree	-	0%
Edison	Italy	40	Broadly agree	-	0%
ENEL Group	Italy	40	Broadly agree	-	0%
Ministry for the Environment, Energy and Public Cleanliness	Malta	36	Broadly agree	-	0%
Energieinstitut an der JKU Linz	Austria	35	Broadly agree	-	0%
Average percentage difference					**- 7.61%**

4. Converting to absolute variation

The average percentage difference was converted to an absolute change by applying the percentage difference to the EU average of each parameter and technology as follows:

$$EU\ absolute\ change_{p,t} = Average\ percentage\ difference_{p,t} \times Average\ EU\ value_{p,t}$$

Where the $Average\ EU\ value$ is the sum of the consulted values by parameter and technology divided by the number of countries.

$$Average\ EU\ value_{p,t} = \frac{\sum_{i=1}^{n} Consulted_{p,t,i}}{n}$$

where:

- $Consulted$ is each consulted value per parameter, technology and for each country; and
- n is the number of countries.

For gas CCGT FOM, the EU average consulted values are shown in Table 13 and the average FOM is €36.7/kW.

Table 13: Consulted values for gas CCGT FOM [€/kW/year]

Country	Gas CCGT FOM Consulted	Country	Gas CCGT FOM Consulted
Austria	35.40	Italy	40.35
Belgium	43.88	Latvia	35.54
Bulgaria	31.26	Lithuania	32.44
Croatia	34.07	Luxembourg	37.24
Cyprus	37.48	Malta	35.99
Czechia	33.23	Netherlands	45.12
Denmark	43.06	Poland	34.42
Estonia	32.49	Portugal	35.83
Finland	36.17	Romania	34.42
Germany	38.35	Slovakia	34.47
Greece	39.26	Slovenia	34.25
Hungary	33.63	Sweden	37.02
Ireland	42.19		
EU Average	**36.70**		

Based on the average consulted value of €36.7/kW and average percentage difference of -7.61%, the EU absolute change resulted in - €2.79/kW.

$$EU\ absolute\ change_{FOM,Gas\ CCGT} = -7.61\% \times 36.7[€/kW] = -2.79[€/kW]$$

5. Implementation of mean shift variation and handling conflicting responses

The adjustment derived from the previous step was applied to the consulted values as a 'mean shift variation', which means all values were shifted up or down by the same amount.

For conflicting cases, when responses received from stakeholders proposed a change in the opposite direction of the mean shift and overall trend (i.e., the corresponding percentage change value has an opposite sign that the average percentage change), the originally consulted value was retained and no adjustment was made. The extreme values, but not the methodological outliers, where considered in this final step. Countries with no feedback were subjected to the mean shift as described above and a country receiving more responses was considered as a conflicting case only if more than half of the responses were in the opposite direction of the mean shift.

For gas CCGT FOM, the consulted values for all countries were shifted down by subtracting €2.79/kW. However, one conflicting response was identified. The response received for Czechia proposed an increase in gas CCGT FOM, while the overall trend was a decrease. In this case, the original consulted value was retained and no adjustment was made. The final values are shown in Table 14.

Table 14: Comparison of Consulted and Final values for gas CCGT FOM [€/kW/year]

Country	Gas CCGT FOM Consulted	Gas CCGT FOM Final
Austria	35.4	32.6
Belgium	43.9	41.1
Bulgaria	31.3	28.5
Croatia	34.1	31.3
Cyprus	37.5	34.7
Czechia	33.2	33.2
Denmark	43.1	40.3
Estonia	32.5	29.7
Finland	36.2	33.4
Germany	38.4	35.6
Greece	39.3	36.5
Hungary	33.6	30.8
Ireland	42.2	39.4
Italy	40.4	37.6
Latvia	35.5	32.7
Lithuania	32.4	29.6
Luxembourg	37.2	34.4
Malta	36.0	33.2
Netherlands	45.1	42.3
Poland	34.4	31.6
Portugal	35.8	33.0
Romania	34.4	31.6
Slovakia	34.5	31.7
Slovenia	34.3	31.5
Sweden	37.0	34.2

Summary of quantitative assessment outcome

The summary of the outcome of the mean shift method applied to relevant parameters illustrated at the beginning of this section is presented in Table 15. In a limited number of cases, the values reported for specific countries were subject to a dedicated adjustment based on feedback received from NRAs. These cases are explained in the footnote.

Table 15: Summary of the quantitative assessment outcome

Technology	Parameter	Avg. percentage difference	EU-wide absolute variation	Conflicting responses
Gas CCGT	CAPEX	+6.1%	+ 74.42 €/kW	Belgium, Portugal
Gas CCGT	FOM	-7.6%	-2.79 €/kW/year	Czechia, *Ireland*[4]
Gas CCGT	VOM	+12.4%	+0.28 €/MWh	Belgium
Gas CCGT	WACC nominal	+13.6%	+0.83 [%]	
Gas OCGT	CAPEX	+10.6%	+79.77 €/kW	Belgium
Gas OCGT	FOM	-3.7%	-0.93 €/kW/year	Belgium, Czechia, *Ireland*[4, 5]
Gas OCGT	VOM	+13.0%	+0.48 €/MWh	Belgium
Gas OCGT	WACC nominal	+13.6%	+ 0.83 [%]	
Batteries	CAPEX	+27.0%	+151.2 €/kW	
Batteries	FOM	+33.1%	+4.94 €/kW/year	[6]
Batteries	VOM	0.0%	0 €/MWh	

[4] In Ireland, the gas connection charge is recovered as an annual fixed cost through the Irish G-TUoS mechanism, rather than as a variable charge on energy injected (€/MWh). Consequently, the connection tariff component for gas CCGT and gas OCGT (2.5 €/MWh for both technologies) is excluded from the final VOM values. The impact of G-TUoS on the FOM of gas-fired technologies is treated as a conflicting response; therefore, the mean shift method adjustment is not applied to these technologies.

[5] The updated Swedish report on the reliability standard proposes a lower FOM value for gas OCGT (18.6 €/kW), and the values used by Svenska kraftnät in its long-term market analysis are also lower. However, since the Swedish TSO participated in the consultation and agreed with the originally consulted values, ACER considers it acceptable not to apply a specific adjustment to the values. Accordingly, the EU-wide reduction of -0.93 €/kW/year derived from the mean shift method is applied, resulting in a final value that is lower than the originally consulted, but still higher than the one reported in the Swedish study.

[6] In Ireland, the grid charging regime for transmission-connected batteries is evolving, with a transition from a demand-based framework (D-TUoS, charged on a €/MWh basis) to a generation- and capacity-based model (G-TUoS, charged on a €/kW/year basis). The tariff review process is expected to conclude in 2027. The CRU estimates a corresponding fixed G-TUoS rate of approximately 9 €/kW/year. ACER acknowledges this development and considers that the increase of 4.94 €/kW/year applied to the FOM of batteries, derived from the mean shift method, is sufficient to reflect this additional cost.

Mean shift approach considerations

Given the scope and distribution of the stakeholder feedback received, the mean shift approach was identified as the most robust method for updating the parameters. First, it enables a consistent adjustment across all Member States, including those for which there was no direct response. Second, this mean shift approach provides statistical consistency to the change applied to the cost levels, while the exclusion of methodological outliers limits the influence of individual observations that are not comparable with the remaining responses. Finally, the correction of the direction of the shift ensures that divergent stakeholder views are appropriately reflected in the resulting adjustment. Taken together, these features provide a robust and consistent approach supported by the available evidence.

The approach does not rely directly on national CONE studies, as many of them are not sufficiently recent to provide a consistent basis for the assessment. Nevertheless, the NRAs were actively engaged in the review of the assessment results and were asked to provide feedback on the proposed final values. ACER took their input into account in the final assessment.

3.6 DSR specific case

The feedback provided for DSR-related parameters was rather limited and heterogeneous. Also, ACER acknowledges that DSR characteristics and stages of development vary across Member States, limiting the possibilities to apply coordinated methods for the adjustment of all DSR parameters for all Member States based on the feedback provided alone. Therefore, ACER adopted custom approaches for the different DSR parameters, as described below.

DSR categories grouping

Given the limited feedback received during the consultation and considering that the distinction between the original DSR bands was not confirmed by the responses, thus ACER have simplified the categorisation to improve the representativeness of the responses.

The DSR categories have therefore been grouped as follows:

- Industrial DSR, combining the three industrial DSR bands originally consulted; and
- Non-industrial DSR, combining commercial and residential DSR.

WACC

The WACC for DSR has been aligned with the final WACC of gas technologies, which has also been selected for all other reference technologies, as described in Section 3.4.

Economic parameters (CAPEX, FOM)

The consultation responses showed that different approaches were adopted when estimating CAPEX and FOM. While some stakeholders allocated most costs to CAPEX, others reflected them primarily through FOM.

To ensure a consistent comparison, the assessment focused on the total annualised cost, calculated as the sum of FOM and annualised CAPEX [€/kW/year]. The annualised CAPEX was calculated using the technical assumptions included in the consultation (i.e., lifetime of 10 years and real WACC as describe above).

$$Annualised\ total\ cost\ \left[\frac{€}{kW \times year}\right] = Annualised\ CAPEX + FOM$$

$$Annualised\ CAPEX = CAPEX\ \times \frac{r(1+r)^N}{(1+r)^N - 1}$$

where:

- r is the real WACC (expressed as a decimal); and
- N is the lifetimes in years.

The total annualised costs were calculated first for the values proposed in the consultation and then for the values proposed by stakeholders. For industrial and non-industrial DSR, annualised CAPEX and FOM were calculated as averages across the original categories. Where only one value was submitted for a grouped category, that value was used directly.

The mean shift method was then applied to the total annualised cost with the following two adjustments to account for the smaller number of stakeholder responses:

- Only methodological outliers (i.e. values obtained with an inconsistent approach) were excluded when calculating the average percentage change, while maximum and minimum values were retained.
- The final direction-correction for conflicting responses was not applied.

In order to determine the average cost allocation between CAPEX and FOM, and to establish a harmonised EU-wide benchmark for the distribution of these two cost components based on the stakeholder feedback, the share of FOM in the total annualised cost was calculated for each stakeholder response. The original DSR categories were applied and the average share of FOM was computed for both industrial and non-industrial DSR.

$$Average\ FOM\ share_g = \frac{\sum_i \left(\frac{FOMg,i}{Annualised\ total\ cost_{g,i}}\right)}{n_g}$$

where:

- g is the DSR category (industrial or non-industrial).
- i is the stakeholder response. When the response received is “broadly agree”, the related values are set as the ones consulted.
- n_g is the number of responses for the corresponding DSR category.

The numerical outcome of the mean shift method applied to the annualised total cost and the average share of FOM is shown in Table 16.

Table 16: Summary of quantitative assessment outcome for DSR

Category	Avg. percentage difference	EU-wide absolute variation	Average FOM share
Industrial DSR	+5.4%	+ 1.43 €/kW/year	74.3 %
Non-industrial DSR	+12.7%	+ 4.12 €/kW/year	71.9 %

After applying the mean shift method, the updated total annualised cost was disaggregated into FOM and annualised CAPEX using the derived average FOM shares. As a final step, the updated annualised CAPEX (€/kW/year) was converted back into CAPEX values (€/kW).

To quantify the impact of this assessment on the originally consulted values, the table below presents a summary of the EU-wide average values for the grouped DSR categories before and after the assessment.

The assessment results in a reduction of more than 60% in CAPEX for both categories. This outcome is consistent with feedback received from several stakeholders who, while not providing quantitative estimates, indicated that the consulted CAPEX values were overestimated. Conversely, FOM values increased substantially, particularly for non-industrial DSR.

The higher CAPEX and FOM values obtained for non-industrial DSR compared to industrial DSR is consistent with the smaller scale of non-industrial DSR assets, which results in higher additional costs per unit of installed capacity. These costs are mainly associated with aggregation, metering, and automation infrastructure, including control systems.

Activation price [€/MWh]

Only a limited number of stakeholders provided values for the activation price, and several respondents indicated that there was insufficient information to propose representative values. Overall, more than half of the stakeholders reported that they were unable to provide quantitative feedback.

In addition, responses were very heterogenous in the range of proposed adjustments. Most respondents proposed lower activation prices, often based on limited information or information from countries other than the one being commented on. On the other hand, a different view expressed that DSR activation costs should be directly related to the value of lost load (VOLL). Table 17 shows the outcome obtained when the DSR categories are aggregated following the same approach adopted for the CAPEX and FOM assessment.

Table 17: Percentage variation of activation price for DSR proposed by stakeholders

Category	N. responses	Min. variation	Max. variation	Avg. variation
Industrial DSR	5	-20.3%	+62.9%	+18.7%
Non-industrial DSR	4	-95.8%	0.0%	-59.4%

The limited number of responses, heterogeneity of values proposed and differing interpretation of activation price prevented the use of a coordinated method for value correction. Furthermore, after grouping the original DSR categories, the traceability of activation prices across the individual bands was lost.

For these reasons, ACER will not provide reference activation price values as an outcome of this public consultation. ACER acknowledges the complexities associated to DSR and considers the need for future studies on the topic.

Additional investment potential

The number of responses received on investment potential was limited and difficult to interpret, as in most cases, stakeholders provided a single value within the now aggregated categories (e.g. a single numerical estimate for industrial DSR out of the original three DSR industrial bands) or applied identical values across all categories. This made it challenging to derive a consistent aggregated estimate for the DSR categories without omitting relevant information or risking double counting. In addition, the sectors of respondents were highly concentrated: across all DSR categories, only one generation company and one academic institution provided estimates, while the remaining responses were submitted by TSOs.

The table below summarises the numerical responses received. Responses for commercial DSR and residential DSR are shown separately, in line with the consulted categories.

Table 18: Percentage variation of additional investment potential for DSR proposed by stakeholders

Category	N. responses	Min. variation	Max. variation	Avg. variation
Industrial DSR	6	0.0%	+542%	+25.7%
Commercial DSR	5	+2.9%	-78.9%	-38.1%
Residential DSR	4	+0.8%	-90.3%	-35.7%

Overall, respondents indicated that the industrial DSR potential was underestimated, while the non-industrial DSR potential (i.e., commercial and residential) was overstated. However, the number of responses and the granularity level were not sufficient to justify an EU-wide adjustment of the proposed values.

Because investment potential expressed in absolute terms is an extensive parameter that is strongly dependent on country-specific characteristics and scale, the same change in capacity can have fundamentally different implications across power systems of different sizes. Therefore, the percentage variation in this metric was not directly comparable across countries, in contrast with the economic parameters analysed above, since they were expressed in intensive units (e.g., [€/kW], [€/kW/year], [€/MWh]) rather than absolute values, making them inherently scalable and directly comparable across countries.

Furthermore, for the specific DSR categories, no country received more than one response on investment potential, resulting in an insufficient evidence base for robust country-specific adjustments. Applying country-specific updates only to those countries with available responses from the consultation would not ensure a robust revision of the originally consulted values.

On the other hand, the consultant's original methodology developed estimates for the DSR potential by applying technology-specific flexibility shares, based on the approach outlined in academic literature[7] and on projections of electricity demand from Eurostat[8]. These flexibility shares were determined based on the specific technologies associated with each DSR category (e.g., heat pumps, air conditioning, electric arc furnaces, and electrolytic primary aluminium), reflecting their different technical capabilities for demand response. The demand projections were based on historical electricity consumption data from Eurostat and extrapolated to 2030, considering the expected evolution of electricity demand, and including the effects of electrification and energy efficiency improvements. The Eurostat's industry categories with higher flexibility potential considered when assessing the potential were basic metals, non-metallic minerals, paper pulp and print, wood and wood products, chemical, and petrochemical.

The industrial sectors considered in the assessment account for approximately half of total industrial electricity demand on average according to Eurostat historical data, although this share varies significantly across countries, ranging from around 40% to 60%. ACER identified some cases as potential outliers and recognise the need of further investigation about the underlying national specificities.

As a demonstration of the robustness of this approach, the consultant's total DSR potential estimate for the EU-27 area was 93 GW, which was within the range of past EU-wide projections for DSR potential that have reported values from 53 to 160 GW[9].

For all these reasons, ACER considers that the consultant's original estimates, developed using a dedicated and consistent methodology, remain a robust set of reference values. The final additional investment potential for the grouped DSR categories was obtained as the sum of the consulted values of the categories that have now been merged.

As explained in Section 3.3, the values provided should be treated as reference values that could be subject to adjustments, where more robust national values are made available. Moreover, ACER acknowledges the complexities associated to estimating the DSR potential and emphasises the need for future studies on the topic.

[7] The methodology used was primarily based on: Gils, H. C. (2014). Assessment of the theoretical demand response potential in Europe. *Energy*, *67*, 1-18.
[8] Supply, transformation and consumption of electricity - Statistics | Eurostat.
[9] Sia Partners (2014) and Gils (2014) estimate 53 and 93 GW of potential, respectively. A study prepared for the European Commission by Ecofys et al. (2016) estimated 160 GW of DSR potential.

4. REVISED DATASET

This chapter presents an analysis of the EU CONE Dataset compared against the stakeholder responses received through the consultation, ENTSO-E's average values used for ERAA 2026 [10] and published national CONE values.

Figure 5 below shows the distribution of CAPEX and FOM values from the EU CONE Dataset across all the reference technologies, which are the two investment cost parameters that are most influential for the reliability standard calculation. For each technology, individual dots represent the country-specific values and the shaded boxes illustrate the range, from the minimum to the maximum value, observed across Member States. The variation of country-specific CAPEX and FOM values reflects national differences in the cost of technologies but remains within a coherent range. This demonstrates that the adopted methodology aims to capture national specificities affecting investment costs while maintaining a coordinated EU-wide approach, thereby ensuring a comparable yet nationally representative set of reference values.

For each technology and investment parameter, Figure 6 to Figure 9 below show the comparison between the final EU CONE reference values, the harmonised value used in the ERAA 2026 and the values from previous national CONE studies. The figures also include the average of the responses received to the public consultation for the corresponding technology and parameter.

The gap between the average stakeholder responses ('Average of PC responses') and the average EU CONE values is small across technologies and economic parameters, ranging from 0.8% to 6.6%. This underscores that the EU CONE values are aligned with stakeholder views.

These figures also point to noticeable differences between the EU CONE Dataset values and those reported in earlier national CONE studies. This is especially evident for gas capital costs (Figure 7 and Figure 8), where recent market developments, including supply constraints affecting project developers, have pushed expected construction costs upwards. Similarly for battery capital costs (Figure 6), lower values in the EU CONE Dataset are in line with expectations of further cost reductions and with the views expressed by stakeholders. These differences can also be observed when comparing the EU dataset with the values used by ENTSO-E, which often reflect averages of earlier national studies.

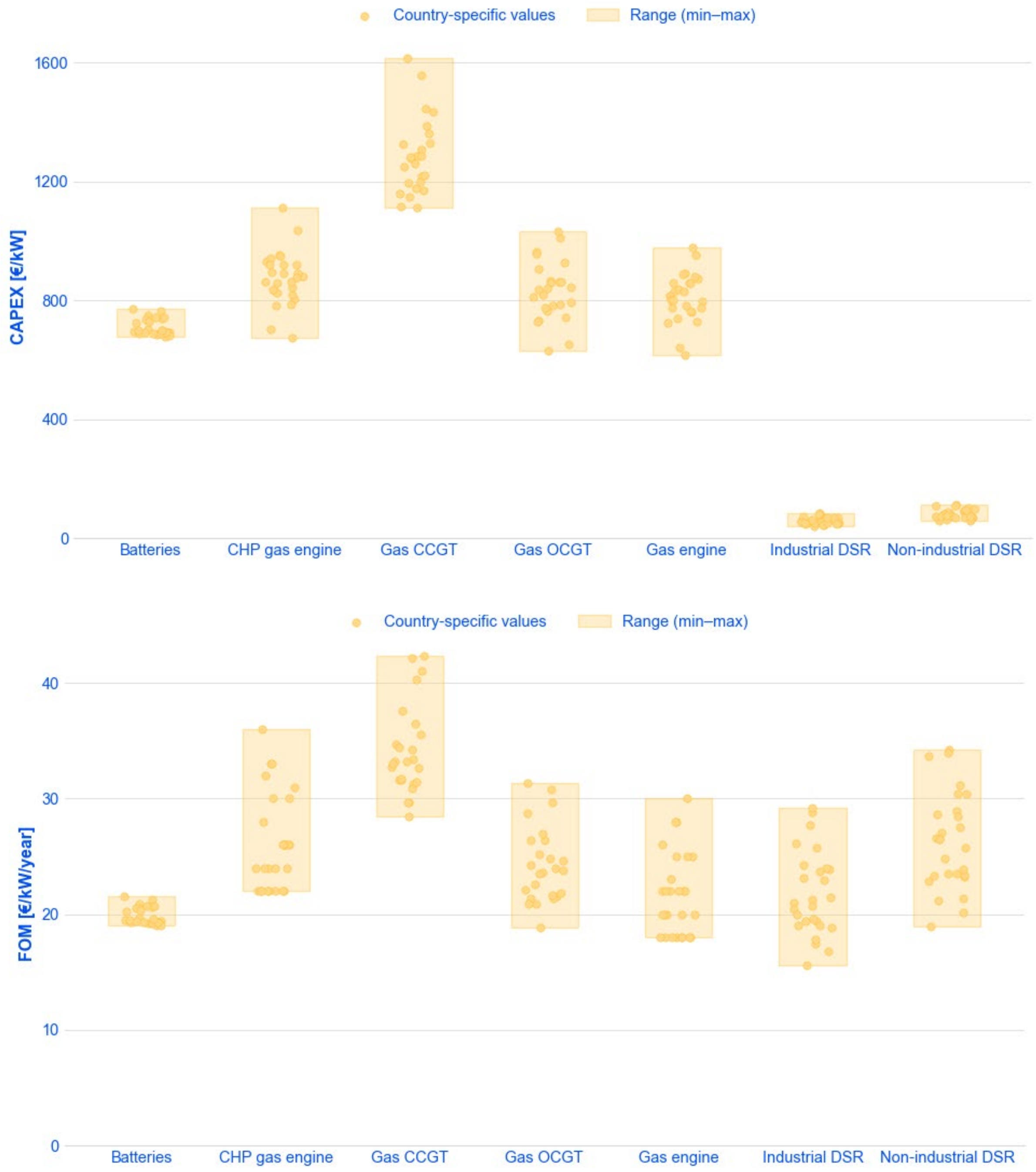
Finally, Figure 6 to Figure 9 underline the difficulties inherent in comparing national CONE studies, as only a limited number of countries have carried out such analyses. Furthermore, those studies were conducted at different times and on the basis of different assumptions. As a result, the values are widely dispersed, which reduces their comparability.

In summary, as the EU CONE dataset relies on a single approach and a consistent set of assumptions, the comparisons mentioned above show that it results in a more coherent picture across Member States than previous approaches that were based on scattered national

[10] Techno-economic parameters in ERAA 2026 are available on the ERAA 2026 page.

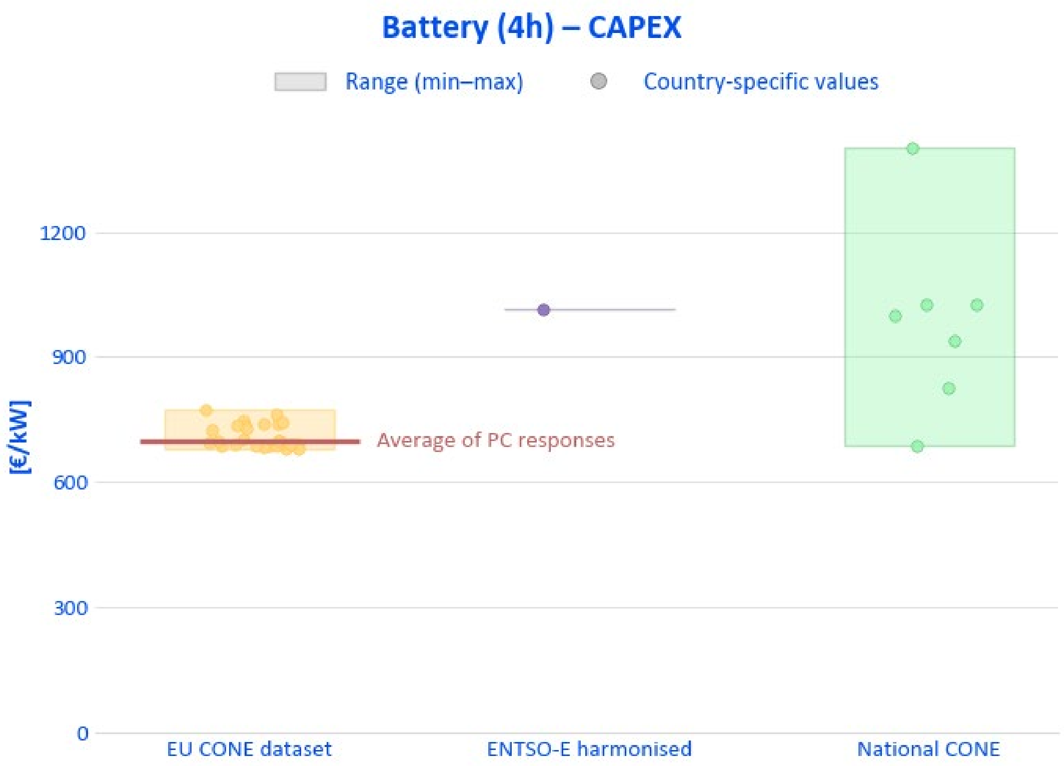
studies or on uniform EU averages, while still reflecting national differences, where these are relevant.

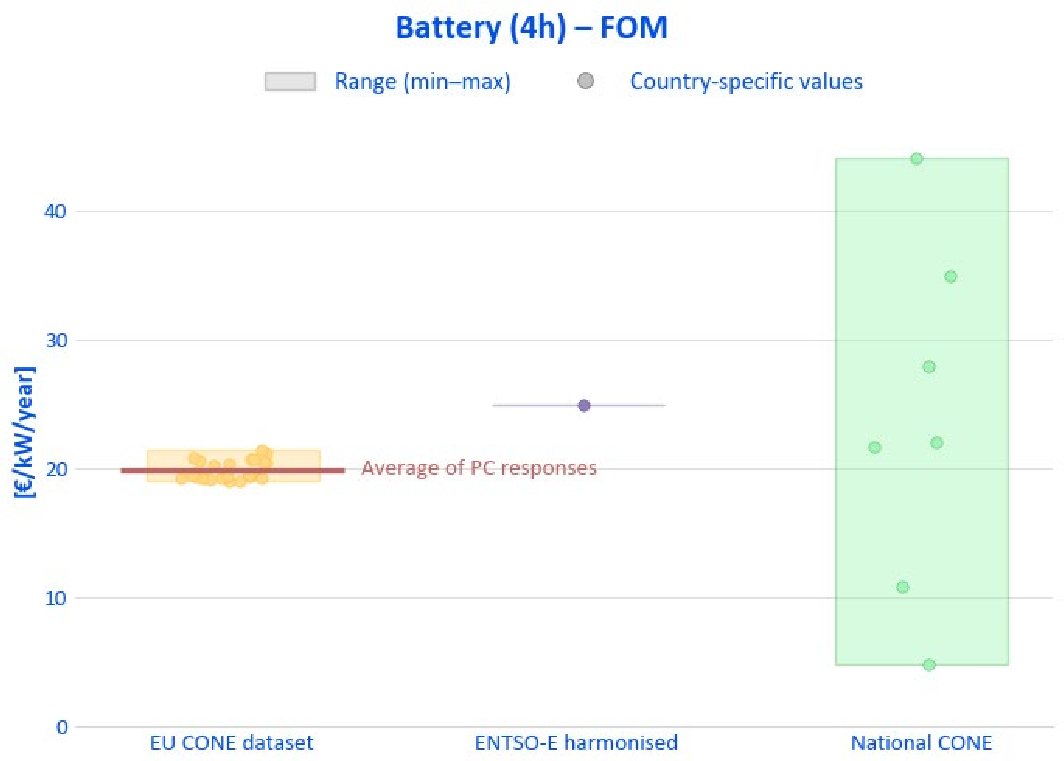
Figure 5: Overview of EU CONE dataset CAPEX and FOM



Source: ACER.

Figure 6: Comparison of 4h-batteries investment parameters



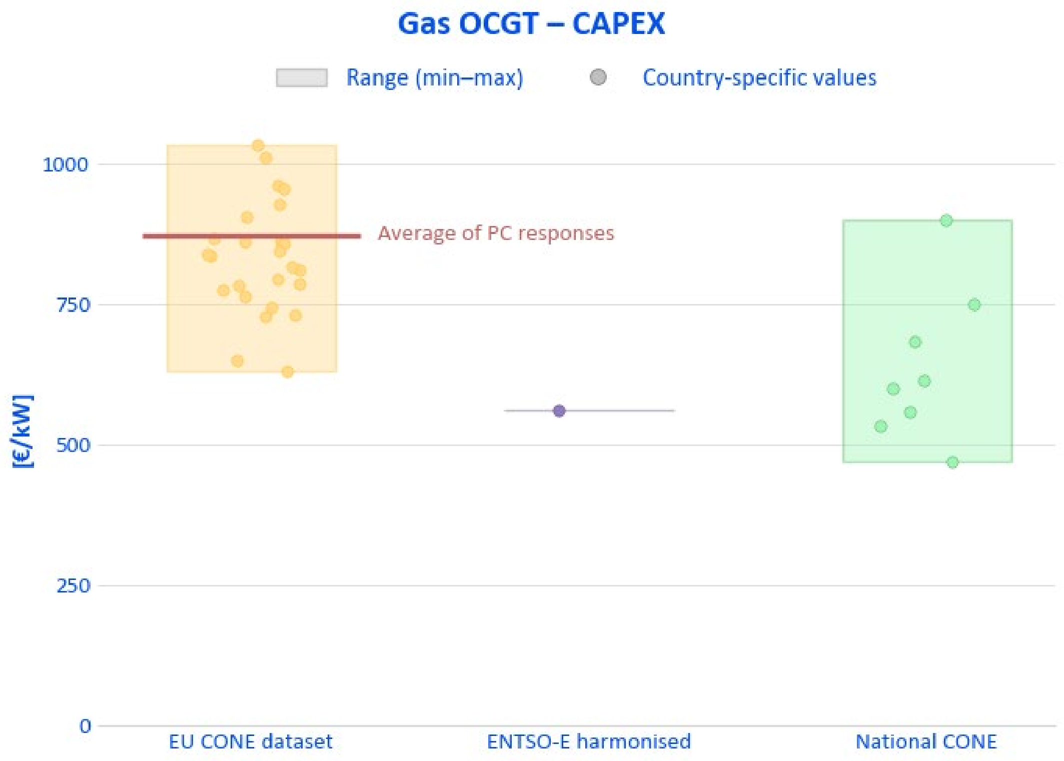


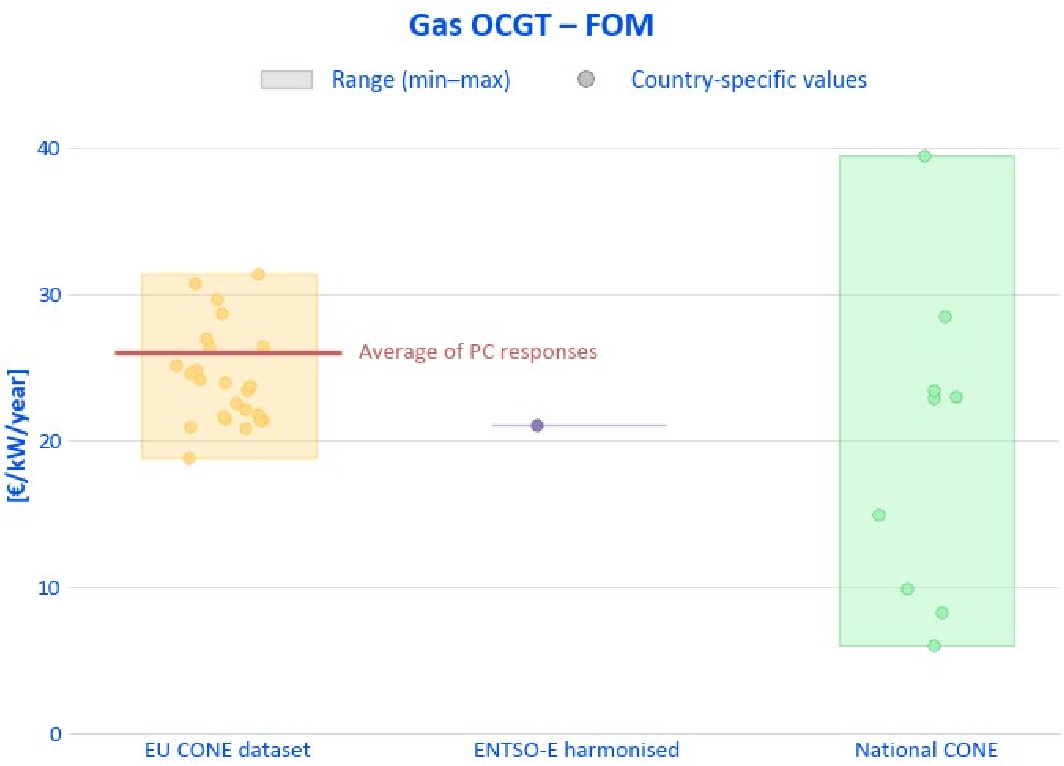
Source: ACER.

Figure 7: Comparison of gas CCGT investment parameters

Source: ACER.

Figure 8: Comparison of gas OCGT investment parameters





Source: ACER.

Figure 9: Comparison of gas engine investment parameters

Source: ACER. Note: the ENTSO-E harmonised value is not shown as this technology is not included in ERAA.

5. CONCLUSION

The public consultation has provided valuable input for refining the economic parameters underpinning the CONE framework and for strengthening the transparency of the overall approach. The feedback received from stakeholders, together with the exchanges held with NRAs, have enabled ACER to improve the dataset and to further clarify a number of methodological aspects relevant to its application.

As a next step, ACER will proceed with the calculation of derating factors, which are necessary to derive the CONE indicators used in the reliability standard calculation. This work will be carried out in line with the approach set out in the recently updated ERAA Methodology.

In parallel, ACER will complete the implementation of the method for deriving the potential of mainstream reference technologies in close cooperation with the NRAs. Where appropriate, the final dataset will be aligned with country-specific information provided by the NRAs, to support the overall comprehensiveness of the European set of investment parameters. In this context, ACER welcomes further feedback as technologies and markets continue to develop, particularly in relation to DSR. The findings of the forthcoming DSR study will also feed into the derivation of DSR potential.

Where specific additional reference technologies have been suggested, ACER will follow up with the relevant NRA to establish appropriate reference values. Depending on the input received, ACER may update the values in the first half of 2027.

Looking ahead, ACER considers it important that the dataset remains responsive to developments in the economic and technological environment. For this reason, the finalised EU CONE dataset will be kept under review and updated as appropriate, with a goal of preserving its relevance and robustness over time.