Polskie Sieci Elektroenergetyczne

Inclusion of regional market

Supplement to

National resource adequacy assessment 2025 - 2040

April 2026

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1 Introduction

Polish national resource adequacy assessment (hereafter "Polish NRAA") was published on 15 November 2024, together with explanations regarding the divergences between the national and the European assessments[1]. Under national law, the Polish TSO (i.e. PSE) is the entity responsible for the preparation of the NRAA. The National Regulatory Authority submitted the Polish NRAA to ACER and the Agency's Opinion (No 1/2025) was published on 3 February 2025 (hereafter: "ACER's Opinion")[2]. ACER's Opinion addresses the differences between the Polish NRAA and the ERAA and evaluates whether these differences are justified.

Main goal of this supplement (hereafter "Polish NRAA supplement") is to present the updated results of the Polish NRAA after incorporating the missing elements identified in ACER's Opinion as unjustified differences. In addition, the assumptions take into account the results of the additional auctions held in 2026 for the individual quarters of the 2027 delivery year.

1.1 Conclusions from ACER's Opinion regarding Polish NRAA

ACER's assessment analyzes twelve changes implemented in the Polish NRAA compared to ERAA 2023. ACER found that they are interlinked and give rise to three main differences:

1. assumptions towards cross-zonal exchanges,
2. capacity resources,
3. the modelling choices made.

For each group of main differences between the Polish NRAA and ERAA 2023, ACER prepared an assessment of their rationale and validity, as presented in Table 1 below.

Table 1. Summary of the differences between the Polish NRAA and ERAA 2023 [source: ACER's Opinion]

No	Difference	Reason for difference	ACER's evaluation
1	Assumptions regarding cross-zonal exchanges	Constrained contribution of foreign units and no possibility for export for domestic units.	Not justified
2	Assumptions on capacity resources	Updates due to new information available.	Justified
3	Modelling of capacity resources	Different modelling of the economics of power plants.	ACER cannot conclude whether the difference

PSE published a response to ACER's Opinion, which is available on the PSE website[3].

[1] https://www.pse.pl/-/publikacja-raportu-zgodnie-z-art-15-i-ustawy-prawo-energetyczne

[2] https://www.acer.europa.eu/sites/default/files/documents/Official_documents/Acts_of_the_Agency/Opinions/Opinions/ACER_Opinion_01-2025_Polish_National_Resource_Adequacy_Assessment.pdf

[3] https://www.pse.pl/-/publikacja-raportu-zgodnie-z-art-15-i-ustawy-prawo-energetyczne

2 Changes to Polish NRAA

One of the recommendations from ACER's Opinion is that (…) *the Polish NRAA does not take into account the full benefits of the internal electricity market for the security of supply. ACER recommends that the import and export assumptions are improved in the Polish NRAA to better reflect the functioning of the interconnected European electricity market. For example, in the Opinion on the Estonian NRAA, ACER pointed out that explicitly modelling foreign bidding zones and regions is an example of good practice. To facilitate the accurate modelling of foreign bidding zones, the starting point can be the datasets available in ERAA.*

Indeed, the Polish NRAA models only the Polish market zone, while other bidding zones are not explicitly represented. However, neighbouring bidding zones are not ignored, as their contribution to adequacy is incorporated directly based on the ERAA 2023 results[4]. This contribution is calculated using the methodology applied for determining the volume of foreign capacity eligible to participate in capacity mechanisms, i.e., the Maximum Entry Capacity (MEC). The MEC calculation takes into account the expected availability of interconnection capacity and the likelihood of simultaneous system stress in interconnected systems. Therefore, in PSE's view, it represents the forecasted expected contribution of foreign resources to the domestic bidding zone (PL00). The method is consistent with ACER's Decision, as outlined in the annex titled *"ACER Decision on Technical Specifications for Cross-Border Participation in Capacity Mechanisms: Annex I"*. Essentially, under this method, the contribution of foreign capacities to the adequacy of the zone hosting the capacity market is determined based on an analysis of cross-border flows during hours when unserved energy occurs in that zone, i.e., during scarcity periods.

The **main improvement** to this updated NRAA presented here in the form of **Polish NRAA supplement** is the **inclusion of the latest ACER-approved ERAA 2024 dataset for foreign bidding zones** in the modelling tool, thereby expanding the NRAA model of PL00. We used the available Economic Dispatch models (after EVA) from the ERAA 2024 study, including the curtailment-sharing methodology and related models. ERAA 2024 covers four target years, and we relied on the most up-to-date and approved edition of the ERAA. The dataset used for PL00 for the ERAA 2024 Target Years was kept identical to that in the original Polish NRAA to ensure consistency. In addition, the calculations took into account the results of additional auctions held in 2026 for individual quarters of the 2027 delivery year; however, 2027 is not a modelled year in the ERAA 2024.

Two additional elements were modified in line with ACER Opinion recommendations. First, the current EVA calculation now incorporates future revenues and costs. Second, the maintenance profile has been aligned with the approach used in ERAA studies[5].

Other modifications result from the use of the ERAA 2024 models. Some enhancements implemented in the initial Polish NRAA had to be abandoned due to computational limitations, particularly constraints related to software feasibility in finding a solution.

Table 2 provides a summary of the changes applied to the calculations performed to obtain this Polish NRAA supplement. If no change was introduced relative to the base study, the relevant section is not described in this document in order to avoid unnecessary repetition (e.g., no description of installed capacity assumptions). Components that remain unchanged are described in Chapters 3 and 4 of the updated Polish NRAA.

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[4] In detail it is modelled as "expensive generator" that is activated after all available domestic units are activated. It results in activation in scarcity moments so there is not much annual energy from this resource. This "generator" reduces number of scarcity hours thus reducing revenues of domestic resources and improves adequacy metrics

[5] The maintenance profile was developed using the same methodology as in ERAA; however, the results differ because the set of units considered is not identical. Additionally, battery maintenance was excluded from the NRAA supplement, whereas it was included in the Polish NRAA, as this aspect is not addressed in ERAA studies

Table 2. Summary of changes done to the Polish NRAA in the supplement

	Component	Changes	Comments
	Calculation methodology		
1	System cost minimization model	Yes	Step omitted – results of ERAA2024 EVA for other than PL00 bidding zones has been taken as input regarding foreign energy mix, demand and costs of generation. For PL00 results of Polish EVA was taken
2	Full energy market model	Yes	Step simplified – full UECD model has been simplified and aligned with ERAA calculation approach EVA calculation considers future revenues and costs.
3	Adequacy model	Yes	ERAA 2024 model used with curtailment sharing
4	Moddeled years	Yes	ERAA models only 4 target years (TY). Polish NRAA covered 16 years. Due to lack of panEU data for periods used in Polish NRAA the approach similar to ERAA is used in supplement i.e. non-TYs are duplicates of the latest available TYs.
	Assumptions		
5	Power and energy forecast	No	
6	Resources to cover power demand	No	The results of the main and additional auctions held to date for delivery periods through the end of 2028 have been included
7	Climate scenarios	Yes	Weather scenarios approach is used.
8	Cross-border exchange	Yes	Full panEU model of ERAA is used.
9	Macroeconomic assumptions	Yes	Data from ERAA2024 is used.
10	Existing units' costs	No	
11	Technical and economic parameters of new generation units	No	
12	Maintenance profiles	Yes	Aligned with the approach used in ERAA studies

All the changes listed above are related to the use of the latest ERAA model from 2024 in the updated NRAA calculations. The updates concerning climate scenarios and macroeconomic assumptions were straightforward to implement and, in general, did not have a significant impact on the calculation methodology. In contrast, the implementation of the full pan-EU model had a substantial effect on both the calculation methodology and the approaches used to build the scenarios. Next chapter presents the approach applied to scenario calculation and highlights the differences between the calculations approach included in the Polish NRAA supplement and that used in the original version of Polish NRAA.

3 Calculation methodology – new modelling approach

The Polish NRAA Supplement covers a sixteen-year horizon, from 2025 to 2040. In contrast, the ERAA 2024 includes only four target years (TYs): 2026, 2028, 2030, and 2035. The original Polish NRAA also included an assessment for 2025, but this year was omitted in the Supplement due to the absence of corresponding data in ERAA 2024.

Consistent with the ERAA modelling approach, the Polish NRAA Supplement assumes that non-target years (non-TYs) are represented by the closest earlier available TY. For example, non-TY 2027 is modelled using the same load, generation capacity, network constraints and other parameters as TY 2026.

Calculations conducted within the Polish NRAA supplement were carried out using two models:

1. economic dispatch model,
2. adequacy model.

3.1 Economic dispatch model

The economic dispatch model used in the Polish NRAA supplement is identical as the one of ERAA 2024. Calculations are carried out individually for each of the four Target Years and for each of the three weather scenarios, following the same approach as in the ERAA 2024 EVA model, i.e., WS14, WS25 and WS28. The weights assigned to the weather scenarios are also identical to those used in ERAA 2024. The optimization is performed for each hour of the year on a week-by-week basis. The model assumes a single schedule for forced outages and a single schedule for planned maintenance.

The output of the calculations performed by the market model is a set of economic parameters for each calendar year and each weather scenario. These parameters determine the second-degree margin index for each generating unit, expressed by the following formula:

$$M_2 = \frac{(I_{EM}) - (C_{FC} + C_{VOM} + C_{EC} + C_{FOM} + C_{RC} + C_{MC})}{P_I} \qquad (1)$$

where:

M_2	–	second-degree margin;
I_{EM}	–	revenue from electricity sales;
C_{FC}	–	fuel cost;
C_{VOM}	–	variable operational costs;
C_{EC}	–	CO_2 emission cost;
C_{FOM}	–	fixed operational costs;
C_{RC}	–	maintenance costs;
C_{MC}	–	mining costs for lignite-fired units;
P_I	–	installed capacity.

Considering the fact, that the Polish NRAA Supplement covers years 2025 to 2040, while the last target year in the ERRA models is 2035, the results for that year for each particular generator asset are repeated until its decommissioning date, e.g. if a given generation capacity is decommissioned end of 2038, its data is repeated four times (for 2035, 2036, 2037 and 2038).

Differences between the Polish NRAA supplement and the original Polish NRAA

Compared to the original Polish NRAA (the one assessed by ACER in its Opinion), revenues from operating reserves and heat sales are not included in the NRAA supplement. The same concerns startup costs. This is because the ERAA model does not have full unit commitment modelling, and therefore these elements were not incorporated.

The final second-degree margin index, i.e. economic viability for units for a given TY, is determined as the sum of the indices from weather scenarios, considering the weights presented in ERAA 2024.

3.2 Adequacy model

The calculations within the Adequacy model in the Polish NRAA supplement are performed using the same economic dispatch model as in the ERAA 2024.

Calculations using this model are carried out for the full set of weather scenarios (36 WSs). The optimization is performed for each hour of the year on a day-by-day basis. The model assumes a single schedule for planned maintenance and fifteen schedules for forced outages.

For each weather scenario, the result of the adequacy model is the number of hours per year where unserved energy occurs, as well as the total energy not served. In the second step, the final result of the adequacy model calculations for a given calendar year (encompassing all weather scenarios) are the LOLE and EENS indicators, which are the average number of hours with unserved energy and the average total unserved energy to electricity consumers among all weather scenarios. Scarcity events are defined as simulation hours during which the energy not served in any bidding zone exceeds a threshold of 0.02 MW. These events occur when a study zone cannot meet its demand despite maximizing generation and imports. Scarcity events are identified based on simulation results after curtailment sharing.[6]

Differences between the Polish NRAA supplement and the original Polish NRAA

Apart from using a completely different model compared to the original Polish NRAA, this NRAA supplement utilizes a higher number of forced outages patterns, i.e. 15 instead of 10.

[6] Two different rules are introduced, namely curtailment minimisation and curtailment sharing. Their main function involves minimising the ENS and equalising the curtailment ratios between the different study zones as much as possible. Further details on this approach can be found in Chapter 11.7 *Local Matching and Curtailment Sharing* of ERAA 2024 Annex 2: Methodology.

4 Scenarios and results

Similarly to the original NRAA, the supplement consists of results of two scenarios:

- **Base Scenario** – assumes the inclusion of existing contracts (results of the main and additional auctions held to date for delivery periods through the end of 2028) in the capacity market and does not take into account any future adequacy mechanisms that could support the development of generation capacity or non-fossil flexibility. Under this scenario, centrally dispatched generating units are expected to operate only when they generate positive operational profits.
- **Scenario with Capacity Mechanism** – assumes that new mechanisms supporting system adequacy would be developed. This scenario foresees the operation of firm generation capacity at a level necessary to ensure the security of electricity supply for end consumers.

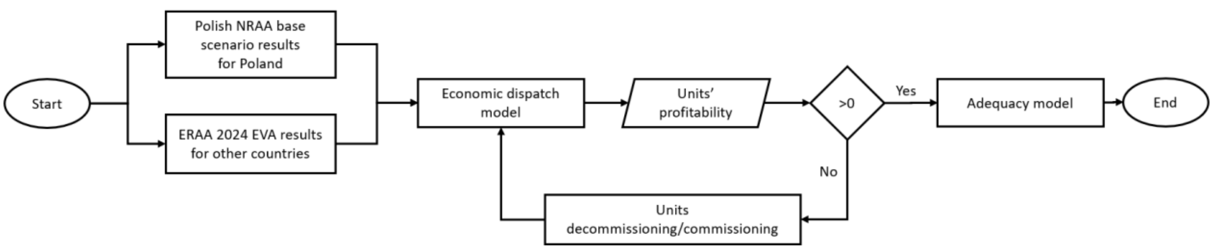
4.1 Base Scenario

The main assumption of the base scenario is to demonstrate the economic viability of all available generating units (both existing and planned) that are centrally dispatched. These units were subjected to economic optimization. Other generating units, such as RES and cogeneration units, were predetermined.

To develop this scenario, the following components were used (Figure 1):

- for Poland – results of base scenario of the original Polish NRAA;
- for other countries – results of ERAA 2024 EVA;
- economic dispatch model – used for iterative analysis of the profitability (economic viability) of the Polish generation units only;
- adequacy model – calculation of system adequacy indicators based on the results of the economic dispatch model.

Figure 1. Process diagram of the Base Scenario



Comparing to the original Polish NRAA, the cost-minimisation model is omitted. Instead, the already available results of Polish NRAA (for Poland) and ERAA2024 (for other countries) are used as inputs for economic viability check.

The main elements of this scenario are the iterations performed in the economic dispatch model. When units are unprofitable throughout their lifetime, part of them is withdrawn from the system during the iterative calculations (i.e. existing units are withdrawn and commissioning of new units is delayed until profitability is achieved in subsequent years). Iterative calculations end when profitability is achieved for all units i.e. all units are economically viable. Given that achieving a result in which all units are profitable required numerous time-consuming iterations, a solution in which a few units remain at the margin of profitability is considered acceptable and yields the calculations result.

Capacity mix inputs for this scenario are:

- For Poland – capacity mix from the original Polish NRAA base scenario results, including RES, CHPs and other.
- For all other modelled bidding zones – capacity mix from ERAA 2024 economic dispatch models i.e. there is no change in the capacity mix in all biding zones except Poland for all iterations.

After completing the iterations of the economic dispatch model, an adequacy analysis with curtailment sharing was conducted. Table 3 presents the results of this analysis. The result of economic viability is the installed generation capacity mix in the system for given Target Year (Figure 2 and Figure 3).

Figure 2. Profitability of CDGU and BESS – Base Scenario [GW]

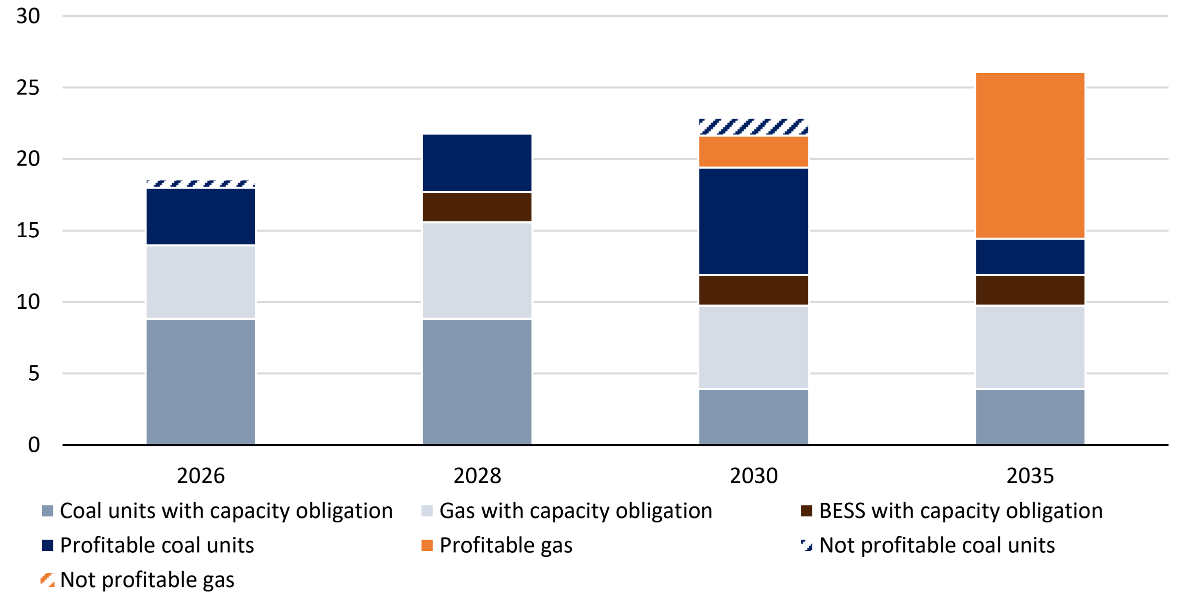


Figure 3. Installed capacity of generation units – all units – Base Scenario [GW]

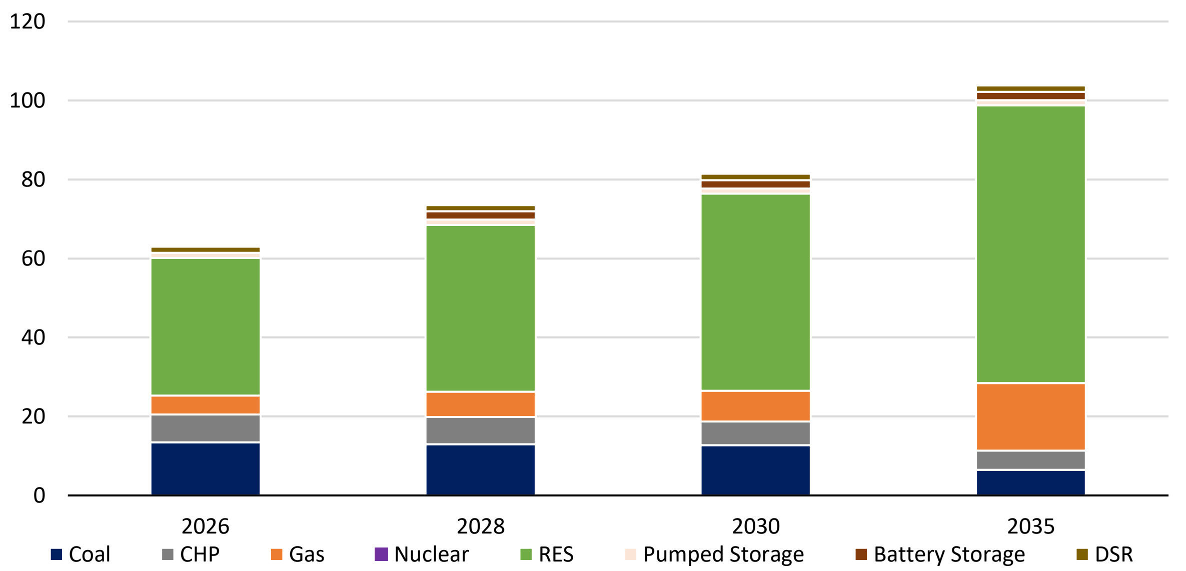
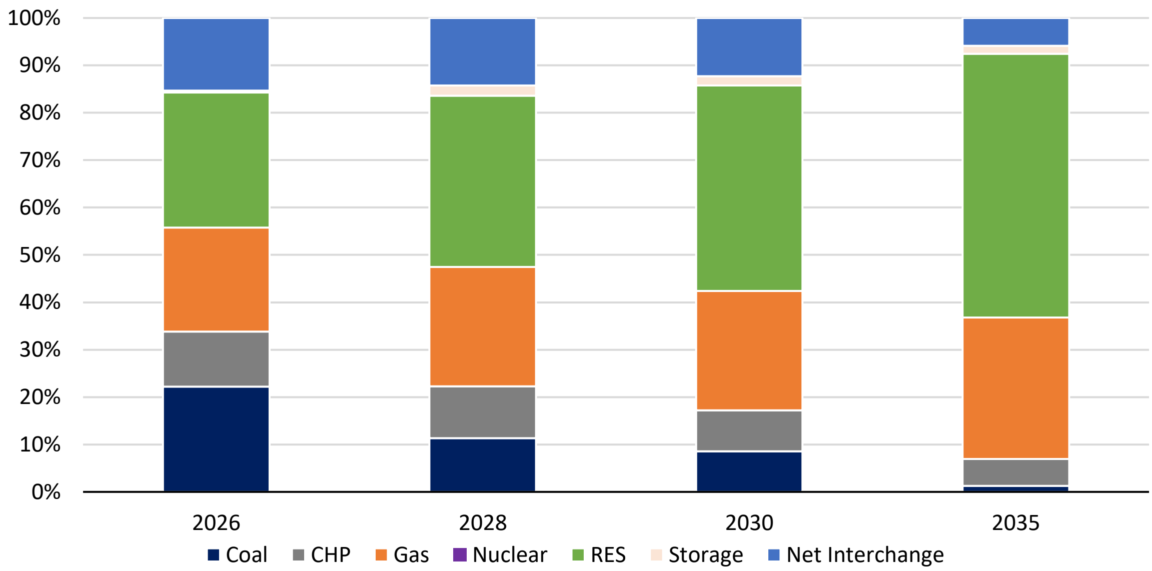


Table 3. Adequacy analysis results – LOLE and EENS – Base Scenario

Year		2026	2028	2030	2035
LOLE average	h/a	8,8	20,0	15,8	18,6
LOLE P95	h/a	36,1	73,5	68,7	65,1
EENS average	GWh/a	5,0	22,0	22,9	28,7
EENS P95	GWh/a	26,7	114,7	151,7	153,0

The charts below present weighted in average generation share of technologies/fuels over the different weather scenarios and net interchange of PL00 bigging zone. In first 3 Target Years the Polish net position reached around 25 TWh/year in import direction, while in Target Year 2035 it reached around 13 TWh/a in import direction.

Figure 4. Generation share of technologies/fuels – Base Scenario



Differences between the Polish NRAA supplement and the original Polish NRAA

Two components significantly impacted the results of Polish units' EVA, and therefore the final adequacy results. These are the inclusion of full pan-EU model and consideration of unit net profits over their full lifetime. In general, this leads to increased decommissioning of coal units in Poland in comparison to the original Polish NRAA for Target Years 2026 and 2030.

Application of the pan-EU model impacted the generation levels of different units, with strongest impact on the coal-fired ones. Poland is net importer in all Target Years, and hence some domestic generation units had to reduce its generation and lost revenue. When comparing the average generation levels in the original Polish NRAA and this Polish NRAA supplement, the reduction of annual generation from coal units is 33% in Target Year 2026, around 45% in Target Years 2028 and 2030, and 50% in Target Year 2035.

On the other hand, inclusion of the pan-EU model did not allow to model all remaining years as the ERAA dataset is limited to 4 Target Years. Impact of this is hard to evaluate.

Table 4 and Table 5 summarizes the differences between the results of this Polish NRAA supplement and the original Polish NRAA. In both cases the base scenario indicates that the reliability standard in Polish biding zone is not met.

Table 4. The results of the LOLE indicator for the base scenario of the Polish NRAA supplement and the Polish NRAA

Study				2025	2028	2030	2033
-	reliability standard	LOLE	h/a	3,0	3,0	3,0	3,0
Polish NRAA	base scenario	LOLE	h/a	7,6	33,3	9,6	15,0
Polish NRAA supplement	base scenario	LOLE	h/a	8,8	20,0	15,8	18,6

Table 5. The results of the EENS indicator for the base scenario of the Polish NRAA supplement and the Polish NRAA

Study				2025	2028	2030	2033
Polish NRAA	base scenario	EENS	GWh/a	5,8	52,1	13,8	24,3
Polish NRAA supplement	base scenario	EENS	GWh/a	5,0	22,0	22,9	28,7

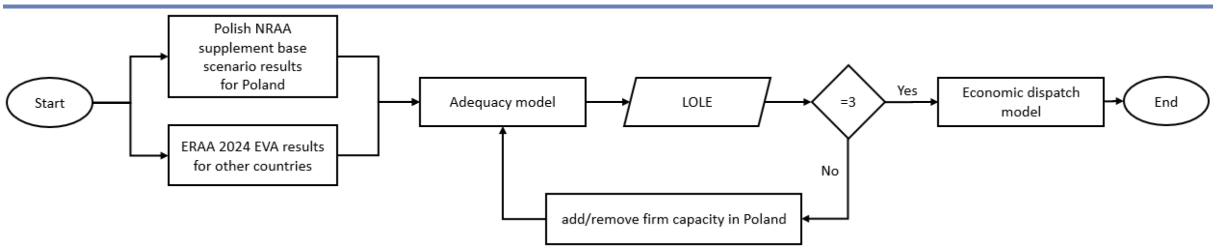
4.2 Scenario with Capacity Mechanism

The main goal of the scenario with capacity mechanism was to analyse what happens when the necessary level of firm generation capacity installed in the system allows to meet the required reliability standard. As part of the analyses conducted under this scenario, an economic analysis of centrally dispatched generation units was performed. The results show that when the reliability standard is met, a significant portion of generation units is unprofitable, i.e. the second-degree margin is negative. Therefore, to maintain these units in the system it is necessary to implement a mechanism or a set of mechanisms that would allow to maintain existing units in operation and invest in new dispatchable power sources (in this case it was hydrogen-ready or biomethane-ready gas-fired units), as well as electricity storage facilities.

To develop this scenario, the following were used:

- for Poland – results of this report base scenario i.e. Polish capacity mix after EVA from chapter 4.1;
- for other countries – results of ERAA 2024 EVA;
- adequacy model with curtailment sharing – the model was used for iterative analysis of system adequacy indicators;
- economic dispatch model – analysis of the profitability of generation units based on the results of the adequacy model.

Figure 5. Process diagram of the Scenario with Capacity Market



The main element of this scenario are the iterations performed with the adequacy model. For each Target Year, the forecast level of resource adequacy is aligned with the reliability standard. This calibration is done by adding or removing fully available (i.e. no outage) generation capacity for the given Target Year[7]. Iterations end when

[7] This calibration approach is described in the methodology for calculating the Maximum Entry Capacity for cross-border participation in capacity mechanisms in accordance with the ACER decision of December 22, 2020 „ACER Decision on technical specifications for cross-border participation in capacity mechanisms"

the LOLE indicator reaches approximately 3 hours per year. Due to high computational requirements, achieving a result equal to 3 hours might in some cases be impossible to be reached, and hence the results close to 3 are considered acceptable.

After completing the iterations in the adequacy model, an economic viability was conducted for the resulting mix for all Target Years. In the economic model, the new added firm capacity is represented as CCGT units with 100% availability.

Table 6 and Table 7 present the results of this analysis, i.e. firm capacity that shall be added to the system (results of base scenario) to meet reliability standard and LOLE/EENS scenario results. The result of adequacy modelling and economic viability is the installed capacity mix in the system for given Target Years (Figure 6 and Figure 7).

Figure 6. Profitability of CDGU and storage – scenario with Capacity Mechanism [GW]

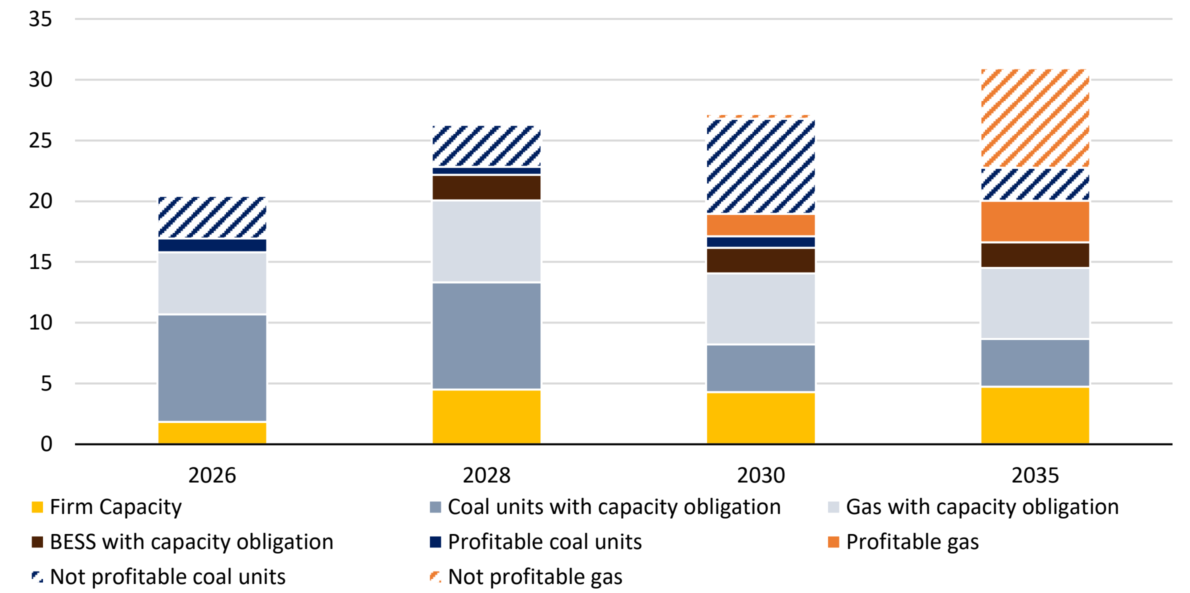


Figure 7. Installed capacity of generation units – all units – scenario with Capacity Mechanism [GW]

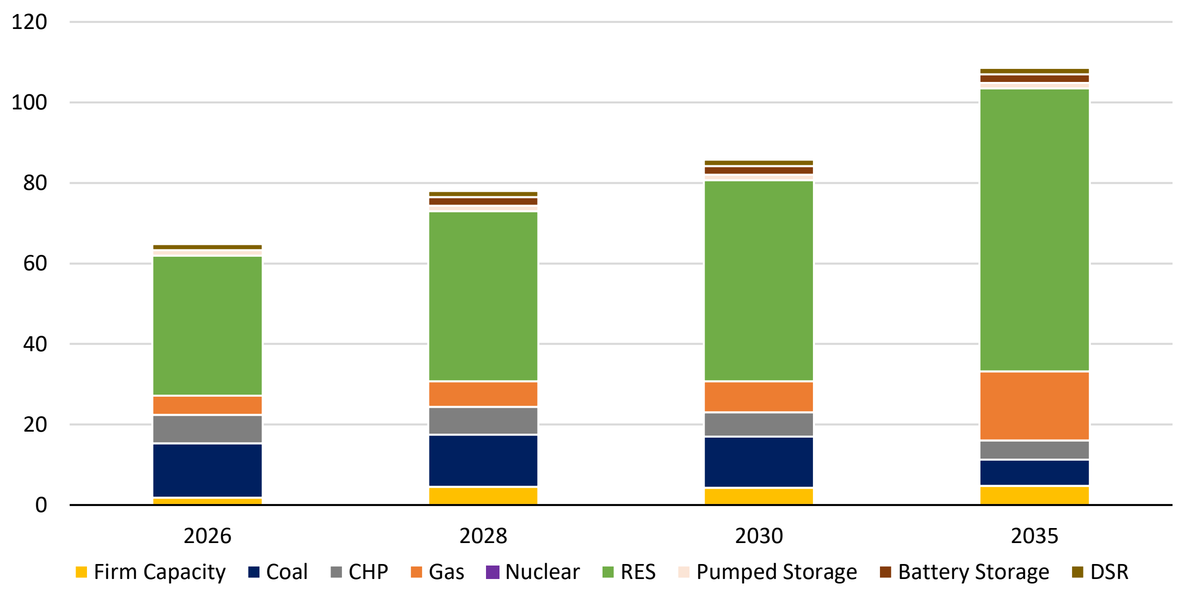


Table 6. Additional firm capacity needs – scenario with Capacity Mechanism

Year		2026	2028	2030	2035
Additional firm capacity need	MW	1 850	4 500	4 300	4 750

Table 7. Adequacy analysis results – LOLE and EENS – scenario with Capacity Mechanism

Year		2026	2028	2030	2035
LOLE average	h/a	3,4	3,2	3,0	3,1
LOLE P95	h/a	17,6	24,2	25,9	19,1
EENS average	GWh/a	1,3	1,2	2,0	2,0
EENS P95	GWh/a	11,3	11,1	19,3	20,3

Calibrating firm capacity in Poland, by adding or removing generation capacity, is a complex task. An increase in firm generation capacity within a single bidding zone does not necessarily lead to a linear improvement in the LOLE index. Results from ERAA 2024 show that several Member States remain inadequate across all target years.

It is essential that ERAA provides both scenarios required by its methodology: one incorporating capacity mechanisms and one without. The availability of these two scenarios is critical for ensuring methodological consistency and comparability. In cases where multiple bidding zones are inadequate, calibrating a single zone becomes particularly challenging. As calibrating all bidding zones lies outside the scope of the NRAA, this assessment was limited to the Polish bidding zone.

Differences between the Polish NRAA supplement and the original Polish NRAA

The inclusion of pan-EU model did not change the LOLE results of Polish NRAA because in both analyses, i.e. in Polish NRAA and Polish NRAA supplement, the goal of scenario with Capacity Market is to reach 3 h/a LOLE. There are differences in the method used to reach the result, but in both assessments there is a clear generation capacity gap that must be filled to reach the reliability standard.

Table 8 and Table 9 presents the differences between results of the Polish NRAA supplement and the original Polish NRAA. In both cases the scenario with capacity mechanism is calibrated to reach the reliability standard.

Table 8. The results of the LOLE indicator for the scenario with Capacity Market of the Polish NRAA supplement and the Polish NRAA

Study				2025	2028	2030	2033
-	reliability standard	LOLE	h/a	3,0	3,0	3,0	3,0
Polish NRAA	Scenario with CM	LOLE	h/a	3,0	2,3	2,2	2,7
Polish NRAA supplement	Scenario with CM	LOLE	h/a	3,4	3,2	3,0	3,1

Table 9. The results of the EENS indicator for the scenario with Capacity Market of the Polish NRAA supplement and the Polish NRAA

Study				2025	2028	2030	2033
Polish NRAA	Scenario with CM	EENS	GWh/a	5,8	52,1	13,8	24,3
Polish NRAA supplement	Scenario with CM	EENS	GWh/a	1,3	1,2	2,0	2,0

4.3 Auctions target capacity (ATC) to ensure compliance with the reliability standard for end consumers in the years 2025 – 2028

The auction target capacity (ATC) represents the total firm capacity required to meet the reliability standard. This capacity can be provided by either domestic or foreign suppliers. The selection of providers takes place during the auction process, where all eligible participants compete on equal terms. Thus where by definition there is differentiation between bidding zones delivering capacity, ATCs are insensitive for cross-border modelling. Since the input assumptions - particularly regarding national demand - have not changed compared to the Polish NRAA, the total firm capacity needed to meet the RS in Poland remains at the same level.

Table 10 presents the ATC to ensure compliance with the reliability standard for end consumers in the years 2025 – 2028 (without considering already concluded contracts).

Table 10. Auctions capacity to ensure compliance with the reliability standard for end consumers in the years 2025 –2028

Delivery period		Required Capacity Obligations
Second half of 2025	MW	24 122
2026	MW	24 872
2027	MW	25 323
2028	MW	25 717

5 Summary and results

This document provides an improved national resource adequacy analysis by means of NRAA supplement. Analysis summarized in this report expands the Polish NRAA model with the inclusion of the newest ERAA 2024 dataset, as approved by the ACER, concerning foreign bidding zones in the modeling tool.

Several features of ERAA 2024 limited our ability to achieve the same level of assessment quality as in the Polish NRAA. Nonetheless, we are convinced that the result's quality of this updated national resource adequacy analysis in the form of NRAA supplement Polish NRAA is at least as credible as ERAA 2024.

Firstly, ERAA covers only four Target Years, with missing years being duplicated. This approach can introduce inaccuracies when assessing the economic viability of generation capacity providers.

Secondly, ERAA 2024 includes only one scenario – without capacity mechanisms. Consequently, our calibration for the scenario with a capacity mechanism was not always fully accurate. Increasing generation capacity in Poland did not significantly improve the LOLE index, likely because only Polish capacity was adjusted while capacities in other countries remained unchanged.

These limitations highlight the importance of ERAA delivering the full scope required by its methodology: 10 target years and both scenarios (one with capacity mechanisms and one without). Implementing these elements in future ERAA studies would substantially enhance the quality and reliability of each NRAA.

The results of the Polish NRAA supplement base scenario show that during the analysed period, the reliability standard in Poland may not be met (Table 11). This is mainly due to the risk of permanent decommissioning of non-competitive coal units, which are unprofitable. Additionally, there is a lack of sufficient new investments in generating sources that could offset the power losses resulting from the decommissioning of these coal resources.

Table 11. Results of LOLE and EENS indicators for the Base Scenario

Year		2026	2028	2030	2035
LOLE	h/a	8,8	20,0	15,8	18,6
EENS	GWh/a	5,0	22,0	22,9	28,7

The results of the updated Polish NRAA base scenario significantly deviate from the goal of meeting the reliability standard. These results were achieved despite considering the full set of tools: i.e. contribution of foreign units to the system balance in form of imports, as well as the use of demand reduction mechanisms through the activation of demand side response service providers and the flexibility of consumers sensitive to price signals.

Moreover, the above results present average values from all weather scenarios. In extreme scenarios, the values of LOLE and EENS may be significantly higher. In extreme scenarios, the risk of unavailability of import contribution from neighbouring systems also has a higher probability of occurrence.

The NRAA supplement report additionally presents the results of a scenario in which it is assumed that the reliability standard will not be significantly exceeded (Table 12) in each year of the analysis if appropriate capacity mechanisms are applied. As in the base scenario, the adequacy model results for this scenario depend, among other things, on the contribution of imports and demand side response.

Table 12. Results of LOLE and EENS indicators for the scenario with Capacity Mechanism

Year		2026	2028	2030	2035
LOLE	h/a	3,4	3,2	3,0	3,1
EENS	GWh/a	1,3	1,2	2,0	2,0

The above results show that in order to maintain the security of system operation, it is necessary to ensure mechanisms for financing dispatchable capacity resources, including generating sources, storage, and demand side response units. Otherwise, there is a significant risk that these resources will not be able to achieve a positive financial result, and consequently, the risk of decommissioning and not commissioning of new ones will materialize, resulting in the base scenario presented in this NRAA supplement report.