



Summer Outlook 2025

**Winter Outlook 2024-2025
Review**

Country Comments

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Country Comments

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28 May 2025

ENTSO-E Mission Statement

Who we are

ENTSO-E, the European Network of Transmission System Operators for Electricity, is the **association for the cooperation of the European transmission system operators (TSOs)**. The 40 member TSOs, representing 36 countries, are responsible for the **secure and coordinated operation** of Europe's electricity system, the largest interconnected electrical grid in the world. In addition to its core, historical role in technical cooperation, ENTSO-E is also the common voice of TSOs.

ENTSO-E **brings together the unique expertise of TSOs for the benefit of European citizens** by keeping the lights on, enabling the energy transition, and promoting the completion and optimal functioning of the internal electricity market, including via the fulfilment of the mandates given to ENTSO-E based on EU legislation.

Our mission

ENTSO-E and its members, as the European TSO community, fulfil a common mission: Ensuring the security of the inter-connected power system in all time frames at pan-European level and the optimal functioning and development of the European interconnected electricity markets, while enabling the integration of electricity generated from renewable energy sources and of emerging technologies.

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Introduction

This document includes individual country reviews on the security of supply situation in their system during the last season. The reviews are also accompanied by comments from the country on the expected adequacy situation or specific operational conditions during the coming season.

The retrospective reviews aim to present the most important events that occurred during the previous season and to compare them to the previous Seasonal Outlook study results. Important or unusual events or conditions in the power system and the remedial actions taken by the TSOs are also mentioned.

Comments on the expected adequacy situation and additional information are presented to provide more background information about the particular power systems, which might not always be represented in pan-European adequacy models.

Countries did not provide comments or reviews if there was no relevant information to be reported.

Albania

Summer Outlook 2025

No adequacy issues are expected for Summer 2025.

Winter Review 2024-2025

No adequacy issues were recorded during Winter 2024-2025.

Austria

Summer Outlook 2025

No adequacy concerns are currently foreseen for the summer of 2025. Nevertheless, Austria's geographically central position within Europe renders it significantly reliant on developments in neighboring countries. As such, the overall adequacy situation is subject to continuous and careful monitoring.

For summer 2025, extended periods of high temperatures and other adverse climatic conditions may pose operational challenges. These factors could notably diminish the output of hydroelectric power stations, especially run-of-river facilities. Furthermore, elevated ambient temperatures may reduce the efficiency of certain thermal generation units within Austria.

Winter Review 2024-2025

The power consumption has slightly increased by 3% during the period in comparison to the former one.

The control area of APG was dominated by a notable decrease of run of river production (minus 3.476 GWh/-43%) because of the untypical dry weather situation and wind production (minus 689 GWh/-23%) during the Winter 2024/2025 (December, January, February) compared with last winter period 2023/2024. The reduction was balanced by additional thermal production (plus 1.688 GWh/+56%) and imports. The control area of APG imported 2.505 GWh in the winter period 2024/2025 representing a switch to winter 2023/2024, in which 217 GWh were exported. The solar production increased by 253 GWh/+65%, linked with the pace of new solar power stations installation.

By the end of April 2025, the energy stored in the water reservoirs within the APG control area was around 15 % of the maximum storage volume, natural gas reservoir filling levels were at 47 % , which is in the range of historical average for that time of the year.

Belgium

Summer Outlook 2025

An update of our internal Summer Outlook process has enabled a better analysis of the expected risks compared to the previous years.

Incompressibility risk is expected to be lower than in 2024. This can be explained by the following:

- Lower nuclear production compared to 2024 due to phase-out or maintenance. On average, we expect 1.5 GW less nuclear.
- Similar availability of pump storage units compared to 2024.
- Load forecasts indicate a slight increase compared to 2024.
- An increase of roughly 1.4 GW in installed PV should not compensate for the factors listed above.

The incompressibility situation in the neighbouring countries could have a negative impact on the export capabilities in Belgium and should be monitored carefully.

The most significant export need moments are expected to happen in spring due to the high level of combined RE production, as could be seen during the last weekends with day-ahead prices reaching -462€/MWh.¹

The summer months can still represent a risk in terms of incompressibility.

The increase of PV installed capacity has led to a rise of the absolute solar forecast error in ID. This implies that forecasting error could be responsible for more ID incompressibility risks in 2025 compared to previous years.

Winter Review 2024-2025

No adequacy issues were recorded during the past season. The availability of the production park was high. Demand was reduced by 6% compared to the previous winters. In general, Belgium maintained low import needs (<1500 MW) for most of the winter.

¹ Information as of end of May 2025

Bosnia and Herzegovina

Summer Outlook 2025

No adequacy issues are expected for Summer 2025.

Winter Review 2024-2025

No adequacy issues were recorded during Winter 2024-2025.

Bulgaria

Summer Outlook 2025

Based on system loads from previous years and established consumption trends, a new summer peak is not expected unless extreme weather conditions occur.

The Bulgarian power system generally reaches its highest electricity consumption during the winter months under normal operational circumstances. In this regard, scheduled annual maintenance of elements of the transmission network is primarily carried out during the summer, in accordance with an approved maintenance schedule for 2025.

As a result of the continuously increasing integration of photovoltaic capacity, the PV generation peak recorded during Summer 2024 is expected to be exceeded. Additionally, this adds uncertainty to both operational planning and real-time system management, which causes a higher level of reserve requirements.

Market-based modeling of the capacity and electricity balances indicates that coal-fired power plants are under significant market pressure, primarily due to the high costs of carbon emission allowances. This trend is expected to further complicate the balancing of electricity generation and demand at the national level. In addition to technical challenges, financial difficulties are also emerging for domestic condensing coal-fired plants, driven by unrealized generation capacity that remains unused due to unfavorable market conditions.

No adequacy or downward regulation issues are expected for the coming season.

Winter Review 2024-2025

During the past winter season, no significant deviations in power system adequacy were observed. There were no exceptional incidents. The system operated within expected stability margins, supported by moderate weather conditions and the absence of extended periods of extreme cold. The absolute system peak load was registered on 20 February 2025, in the time interval 18:00–19:00 EET, reaching 7337 MW. This represents a 6.3% increase compared to the peak load recorded during Winter 2023–2024, since the previous winter was milder overall. During this peak hour the total system generation capacity dispatch was approximately 7800 MW, resulting in a net export of 463 MW.

Consistent with operational policy, no scheduled outages or maintenance activities were carried out on critical transmission or generation infrastructure during the winter period, ensuring maximum system availability.

Croatia

Summer Outlook 2025

No adequacy issues are expected for Summer 2025.

Winter Review 2024-2025

No adequacy issues were recorded during Winter 2024-2025.

Cyprus

Summer Outlook 2025

As there are no interconnections to rely upon in case of emergency due to Cyprus being an isolated island, there is a small probability that adequacy issues could arise through the coincidence of unplanned outages and unfavourable weather conditions.

Winter Review 2024-2025

During the winter period, there were periods with low replacement reserve availability, due to unplanned outages. In several of these cases, the available replacement reserve was insufficient to cover the loss of the largest synchronised generator.

Moreover, an extreme cold spell coincided with unplanned outages of old heavy fuel oil generators, which resulted in a very marginal adequacy situation towards the end of February. Calls for energy savings were issued by the TSO. No load shedding was required, as the extreme cold temperatures enabled increased output from Gas Turbines.

The NRA was formally notified, where required.

Czech Republic

Summer Outlook 2025

No adequacy issues are expected for Summer 2025.

Winter Review 2024-2025

No adequacy issues were recorded during Winter 2024-2025.

Denmark

Summer Outlook 2025

The main focus throughout the summer will be on the planned outages for key lines, especially in East Denmark. Additionally, attention will remain on the already implemented market models and the new market model set to launch during the summer.

Winter Review 2024-2025

There have been no adequacy issues, and the implementation of the new market models have been successful.

Estonia

Summer Outlook 2025

No adequacy issues are expected for Summer 2025.

Winter Review 2024-2025

No adequacy issues were recorded during Winter 2024-2025.

Finland

Summer Outlook 2025

Similar to Summer 2024, there will be several limitations in transmission. The Estlink 2 interconnector is out of use again due to cable damage and based on current knowledge it will be in use on 15 July. In addition, transmission capacity will be limited between Finland and both northern and southern Sweden due to maintenance on several occasions throughout the summer. Nevertheless, no adequacy issues are expected for upcoming summers, although the annual power plant maintenances and limitations of interconnectors will reduce the flexibility of the power system.

Winter Review 2024-2025

The past winter was calm in terms of electricity adequacy. Reliability of power plants was high and there were no unplanned outages of nuclear power plants. However, the Estlink 2 cable was damaged on Christmas Day and could not be repaired, resulting in the transmission capacity being decreased by 650 MW for all the winter. In addition, there were some additional short-term capacity limitations to both Sweden and Estonia caused by planned maintenance.

There were no extreme cold periods which caused electricity consumption to stay at a moderate level. Peak demand was recorded on 4 February at 19:30-19:45 EET, with demand reaching 13,314 MW. At the same time, domestic production was 13,246 MW and net imports were 68 MW. The peak demand was significantly lower compared to the previous winter when demand reached 14,993 MW, almost an all-time high. The temperature measured by regional electricity consumption was -5 °C during this year's peak demand and -24 °C during last year's.

France

Summer Outlook 2025

No adequacy issues are expected in France this summer, given the good nuclear availability (expected to be close to last year's level at the same period), the level of hydro and gas stocks, and the growth in installed wind and solar power capacity. The upward margins are thus sufficient, even assuming a cautious approach to the level of availability of the nuclear fleet and the level of electricity demand. Moreover, France is likely to maintain its export position on average over the summer, with available production generally above projected consumption levels.

On the other side, risks remain on the downward margins due to high RES generation and relatively low electricity demand in summer as such conditions can lead to high-tension conditions. However, such situations should be limited considering margins available on cross-border transfer capacities, availability of voltage adjustment equipment and real-time coordination with generation facilities.

Winter Review 2024-2025

No adequacy issues were recorded during Winter 2024-2025.

In 2024, electricity generation in France continued to increase, reaching its highest level in five years (539.0 TWh), slightly above 2019 and in line with the 2014–2019 average (537.5 TWh). For the first time, low-carbon generation (nuclear and renewables) reached the threshold of 95% of the total electricity generation. This performance was driven by three main factors:

- A swift rebound in nuclear generation (361.7 TWh), following a historically low level in 2022 (279.0 TWh) and a progressive recovery in 2023 (320.4 TWh).
- Exceptional hydro production, the highest since 2013 (75.1 TWh).
- Continued growth in wind and solar output (71.6 TWh in 2024) with additional 5 GW of solar capacity, 1.1 GW of wind onshore installed in 2024 and wind offshore capacity reaching a total of 1,5 GW by the end of the year.

In 2024, electric demand (adjusted for weather contingencies) totalled 449.2 TWh, representing a slight increase of +3.0 TWh (+0.7%) compared to 2023. This level breaks with the downward trend observed over the previous years, due to a slightly more favourable macroeconomic context. This increase particularly concerns large electricity consumers (industrial and tertiary consumers connected to high-voltage grid), whose aggregate consumption has risen by +2.4% compared to 2023, after having been severely affected by the Covid crisis and then by the energy crisis. The country's overall consumption, nevertheless, remains down on historical levels, by around -6% (-30 TWh) in 2024 compared to the average of the 2014-2019 period.

This remaining historically low demand together with higher generation allow France to achieve a record level of exports with 101.3 TWh of gross exports and net export balance of 89 TWh.

Germany

Summer Outlook 2025

Non-market resources

Based on the knowledge at the time of data collection, the German non-market resources contain:

- Capacity reserve: Since 1 October 2024 and until 30 September 2026, a total contracted capacity of 1.2 GW of power plants is available for unforeseeable demand balancing events. These power plants must be available within 12 hours and can also partially be used to resolve grid congestion.
- Grid reserve: This is used to resolve congestion and contains different types of power plants in Southern and Western Germany. It comprises a total capacity of 7.6 GW. Secondary to capacity reserve, they can also maintain generation adequacy.
- Special network equipment power plants: They are fast-starting gas-fired power plants with an overall capacity of 1.2 GW, primarily intended to restore grid stability after a disturbance in the transmission grid. Secondary to grid reserve, they can also maintain generation adequacy.

Parts of the above-mentioned non-market resources primarily have a different purpose than coping with resource adequacy risks, such as congestion management. Therefore, non-market resources may already be partially exhausted for their primary purpose and unavailable for resource adequacy purposes.

Load

The forecasted load for 2025 in Germany was estimated at 504 TWh. This represents a slight increase compared to the 494 TWh in 2024, as reported in preliminary publications by the German Association of Energy and Water Industries (BDEW). The annual peak demand in 2025 is 90.2 GW. For the summer period (02 June to 5 October), it is 74.6 GW. The load can therefore be classified as relatively moderate, and no critical load-driven deterioration of the resource adequacy situation is expected. The ongoing unstable economic situation and the resulting slower growth in new consumers (e.g. heat pumps and electric vehicles) are seen as contributing factors.

Additional remarks

The pumped-storage power plants (PSPs) of the "Kraftwerksgruppe Obere Ill-Lünersee" (turbine capacity: 2.2 GW; pumping capacity: 1.4 GW), which are installed in Austria but assigned to the German control block, remain in the German dataset. For the same reason, the pumped-storage power plant Kühltai and storage power plant Silz (total turbine capacity: 0.8 GW; total pumping capacity: 0.25 GW) are also included in the German dataset.

A heat wave (prolonged hot and dry period) could constrain power plant availability because of limited cooling water supply and elevated water temperatures or challenges in fuel transportation caused by low river levels.

Downward regulation assessment

The expansion of renewable energies, particularly photovoltaics (PV), increasingly necessitates the monitoring of oversupply situations. In this context, the report presents, for the first time, the excess energy from renewable sources as derived from the market model. While we welcome this methodological advancement, we would like to emphasize the importance of further developing market modelling, such as incorporating predefined controllability factors for renewable energy sources. This would enhance the accuracy of simulation results and improve their interpretability. Given the current assumptions and the focus on adequacy, the conclusions that can be drawn about real-world conditions remain limited.

Winter Review 2024-2025

Winter 2024-2025 was evaluated as uncritical by the national winter monitoring and the pan-European Winter Seasonal Outlook. In practice, no severe resource adequacy-related situations occurred.

Throughout the winter, we repeatedly observed periods with low infeed from PV and wind. In some cases, these coincided with periods of high demand in the evening hours, which led to low remaining capacities, high net imports and high day-ahead auction prices.

Gas storage levels were high to enable sufficient electricity generation. However, consumption appeared to be higher compared to previous winters, such that the gas storage facilities are filled with about 30% as of 14 April 2025, compared to about 70% in 2024. Nevertheless, no critical situations are expected.

Great Britain

Summer Outlook 2025

No adequacy issues are expected for Summer 2025.

Winter Review 2024-2025

No adequacy issues were recorded during Winter 2024-2025.

Greece

Summer Outlook 2025

For the upcoming summer, there is no scheduled maintenance of generation units during high demand period (20 June to 20 August). The possibility of extension of scheduled unit maintenances within high demand period is low. One new thermal unit of total installed capacity of 850MW is expected to be committed to the system within summer.

IPTO is in continuous contact with the Gas Transmission System Operator to be able to initiate the switch fuel procedure in some bi-fuel units (gas to oil) in case of emergency. The operation with alternative fuel is limited to a few days and is only considered as an urgent countermeasure in case of lack of gas supply and not a continuous operation mode.

Water reservoir levels are lower than the previous years due to the drought during Winter 2024-2025 and the absence of inflows. The continuing absence of rain and drought conditions during spring raises concerns about the availability of hydro power plants during summer.

There is no scheduled maintenance or capacity limitations on any of the interconnection lines for the upcoming high demand period.

Consumption during the upcoming summer is expected to be higher than previous years due to the worsening environmental conditions.

In addition, due to the worsening environmental conditions, extended large scale fires in all Greek territory during summer occur increasingly the last years, resulting in many cases, in outages of parts of the transmission system.

New 150kV and 400kV OHL and HVSS came into operation or expected to be in operation strengthening the stability and reliability of the transmission system.

The expected generation, the increase of RES installed capacity, and import capacity are sufficient to cover Greek energy needs under normal conditions and any adequacy issues are not expected, given that gas supplies will be continuous and redundant to cover domestic demand.

However, the Greek system will be highly dependent on import transfers during high demand periods in combination with low-RES generation, in order not to face any adequacy issues in high demand peaks.

On the contrary, due to the high penetration of RES, both in the transmission system and the distribution network, during low demand days (weekends and bank holidays), it is likely that there will be RES production restraints for balancing purposes and thus the control of the distribution network RES is of utmost importance.

Regarding Crete Island, the DC connection line between mainland Greece's transmission system and Crete Island's transmission system will be in commissioning mode during the summer and is expected to be in operation at the end of 2025. Thermal units on Crete Island will be decommissioned after the DC connection line has been fully set into operation. Moreover, several small portable generators are added to strengthen Crete Island's transmission system and assure adequacy for the summer.

Winter Review 2024-2025

In context, last winter was mild and drought while the average consumption increased by 2.5% in comparison with Winter 2023-2024.

There was limited snowfall and rainfall resulting in lower water reservoir levels than expected.

There were no exceptional incidents.

No adequacy issues recorded.

Hungary

Summer Outlook 2025

Based on the previous years' system loads and observed typical trends, we might reach a new historical peak load for the summer period, but do not expect an all-time high value, except in extreme weather conditions. In fact, we predict that the previous PV output peak will be exceeded in the coming summer months mostly due to the ever-increasing level of PV integration. The continuously growing PV generation can also cause higher uncertainty in operational planning periods and real time system operation as well, which causes a higher level of reserve requirement. However, in recent years, no major conventional power plants have been added to the Hungarian power-plant park and import is still almost constantly required. The utilisation of conventional power plants can be overall lower than in the previous summer since particular market situations such as negative Clean Spark Spread (CSS) can make it economically unprofitable for some of the power plants to operate. Two units of our nuclear power plant will undergo obligatory maintenance this summer, however the level of maintenance of the Hungarian power plants is overall a bit lower than previous years and they are carefully distributed in time. In addition, network developments are made continuously to manage higher voltage levels as well as to improve operational security. As a result of our continuously improving reserve procurement methodology, the amount of balancing capacity expected to be available is sufficient to secure the estimated reserve requirement and to guarantee the system adequacy.

Altogether, the Hungarian power system is expected to be safe during this summer period. However, it is important to note that a possible natural gas crisis could have unforeseen effects. In addition, extreme weather conditions such as long-term heatwaves, as well as high water temperatures and low water levels in major rivers can also be a risk in the coming summer period.

Winter Review 2024-2025

Compared to the previous year, a higher load was observed during Winter 2024-2025 due to particularly colder weather and market conditions. The maximum load (7663 MW) was reached on 20 January 2025, which is above the previous historical peak load. During the period under review, the PV output also has been exceeded several times, peaking on 20 March 2025 with a value of 3907 MW. This can be explained by the ever-increasing level of PV integration and the beneficial weather conditions.

On several occasions significant downward regulation was necessary, once approaching 877 MW. Alongside this, the highest upward regulation in this winter period was reached on 11 November 2024, with a value approaching 1060 MW. The utilisation of conventional power plants was overall higher than in the previous winter, while the level of maintenance was average and carefully distributed in time. During the winter, the amount of balancing capacity available was sufficient to secure the occurring reserve requirement.

On a few occasions, the Hungarian system entered the Alert state and three times even the Emergency state mostly due to high voltage levels and loss of tools. These have all been withdrawn within a few hours. Even though we have faced some difficulties due to weather conditions among other things, last winter passed without any major adequacy issues.

Ireland

Summer Outlook 2025

We expect tight generation margins throughout the summer period at times of low renewables output, with the highest adequacy risk identified in late August and early September. A 750 MW coal/heavy fuel oil power plant will exit the market on 1 July; however, the plant will be retained as a non-market unit. This will bring the total non-market generation available in an emergency to 1,400 MW. Increased interconnection to Great Britain, through the new 500 MW HVDC interconnector, Greenlink, which went live on 30/01/2025 and increased solar penetration will also help mitigate risks.

Winter Review 2024-2025

There were two cold spells during Winter 2024-2025; one in the second half of November and a longer one at the start of January, both yielding system demand records. The peak demand record of 6,024 MW was recorded on 01/01/2025 at 17:47 local time. The record from the previous winter stood at 5,577 MW. The dispatchable generation forced outage rate was 14.7% over the period. There were strong market-driven imports into the island of Ireland from Great Britain throughout the period over the HVDC interconnectors. 650 MW of non-market generation, though not run, supported the system helping to avert three System Alerts that would otherwise have occurred.

There were two System Alerts issued over the winter period. These were issued due to weather warnings and were not adequacy related:

Storm Darragh - from 06/12/2025 at 21:00 to 07/12/2025 at 10:00

Storm Éowyn - from 24/01/2025 at 00:00 to 24/01/2025 at 16:10

Summer Outlook 2025

Upward adequacy assessment

Import from neighboring countries is expected to be necessary under severe conditions to restore adequacy margins and cover consumption during critical hours (+1.0 GW), although with lower necessity than previous summer.

The main differences from last summer are:

- An increase in thermal available capacity
- An increase in battery capacity
- An increase in RES capacity, even though not effective during evening peak hours.

Analyses estimate that the risk for adequacy is within standard levels.

Critical situations could occur in the unlikely event of high demand due to a heatwave, low imports from neighboring countries, or a higher-than-usual rate of unplanned outages of generation units.

Postponement and/or cancellation of maintenance activities could be used as countermeasures, along with demand response measures and additional market interventions, to help restore margins or at least mitigate the risk.

Furthermore, improved regional coordination processes, including regional weekly adequacy assessments (STA project) and the Critical Grid Situation process, will support the definition of appropriate and efficient countermeasures should the risk of encountering critical situations be detected in the short term.

Generation capacity in Italy

Renewable generation capacity has increased by approximately 6.9 GW compared to the beginning of summer 2024.

Thermal power capacity remains consistent with that of summer 2024, due to the concurrent decommissioning of existing power plants and the commissioning of new ones, but the available capacity slightly increases compared to last summer, as a result of new power plants now fully available on market.

Currently the total amount of installed renewable (wind, solar and hydro generation) is around 74 GW, exceeding thermal capacity, that stands at 62 GW.

Downward regulation assessment

The most challenging weeks for downward regulation are expected to be the central weeks of August, as well as the beginning and end of the summer period (June and September). To ensure system security, Terna may adopt enhanced coordination with neighbouring TSOs and implement special remedial actions, such as the curtailment of inflexible generation. Additional special actions, such as the application of allocation constraints on transmission capacity, could be planned in cooperation with neighbouring TSOs.

Winter Review 2024-2025

During last winter, electricity demand slightly increased by about 0.2% compared to the same period last year. However, a reduction in consumption was registered with respect to the previous year, with a decrease demand of around 0.9 % (without considering the effect of temperature).

As far as the peak power demand is concerned, winter 2024/2025 saw a 0.9 % increase with respect to winter 2023/2024.

Compared with last winter, coal production decreased, while solar photovoltaic power generation played a key role in covering demand, partly due to the increased solar PV installed capacity in operation.

Export from Italy North border during the whole winter period increased by 56% compared to the very low values of last year and for the first time values up to 3GW were registered during working days.

Latvia

Summer Outlook 2025

No adequacy issues are expected for Summer 2025.

Winter Review 2024-2025

No adequacy issues were recorded during Winter 2024-2025.

Lithuania

Summer Outlook 2025

At the beginning of this summer, net generating capacity in Lithuania will be 6415 MW. Most noticeable changes can be seen in RES generation. Wind net generating capacity has increased by 40% and solar by 29%, compared to last year's summer. These numbers will be rising throughout the summer through the end of the year, due to the rapid growth of solar power and additions of new wind parks. Starting 10 June and for the rest of the year, Lithuania PP G-7 (287 MW) will be under maintenance. A planned outage of DC cross-zonal link between Lithuania and Sweden will take place from 9 to 14 September, where capacity will be reduced from 700 MW to 0 MW.

In order to ensure isolated operation in 2025, if necessary, Litgrid has production availability reserve of 1280 MW.

No adequacy or downward regulation issues are expected for the coming season.

Winter Review 2024-2025

In early February 2025, Lithuania, along with other Baltic countries, synchronized with continental Europe after departing from the BRELL power grid. One change after synchronization was that in LT-PL cross-border capacity. As of now, the capacity for PL→LT direction is 154 MW (as planned previously) and 177 MW for LT→PL direction (a slight increase from planned capacity).

In Winter 2024-2025, national consumption was 1.3% higher than in Winter 2023-2024. Maximum total load (2167 MW) was reached on 11 February 2025.

The winter balance portfolio consisted of 68% local generation and 32% imports from neighbouring countries. The largest import provider this past winter was Sweden. Litgrid has imported 51% less electricity from Sweden than in previous winter seasons. The main reason as to why local generation during Winter 2024-2025 was higher than usual winter seasons was growth of RES. Solar generation increased by 118% compared with last year's winter with solar generating capacity increasing by 50% (by 613 MW), while wind generation remained at a similar level, despite the increase of wind capacity by 44% (by 560 MW).

Imports contributed significantly to adequacy in Lithuania. No adequacy issues were experienced.

Luxembourg

Summer Outlook 2025

No adequacy issues are expected for Summer 2025.

Winter Review 2024-2025

No adequacy issues were recorded during Winter 2024-2025.

Malta

Summer Outlook 2025

No adequacy issues are expected for Summer 2025.

Winter Review 2024-2025

No adequacy issues were recorded during Winter 2024-2025.

Montenegro

Summer Outlook 2025

No adequacy issues are expected for Summer 2025.

Winter Review 2024-2025

No adequacy issues were recorded during Winter 2024-2025.

Netherlands

Summer Outlook 2025

No adequacy issues are expected for Summer 2025. The peak load calculated for the Netherlands is approximately 5-6 GW too high. We expect a peak load of 16.5 GW.

Winter Review 2024-2025

No adequacy issues were recorded during Winter 2024-2025.

Northern Ireland

Summer Outlook 2025

It is expected that there are sufficient generation margins to meet consumer demand throughout the summer period in normal operating conditions.

Winter Review 2024-2025

Dispatchable generation margins remained tight over Winter 2024-2025, due to significant and unforeseen damage at a power station in Northern Ireland caused by a storm, which resulted in the loss of a significant amount of conventional generation. As a result of this damage, three of six large generators in Northern Ireland were forced into extended outage which was necessary to assess and resolve damage caused by the storm.

There were four system alerts issued in Northern Ireland over Winter 2024-2025. Three of these (01:45 01/09/2025 – 01:30 04/09/2025, 21:00 17/12/2025 – 01:39 18/12/2025 and 09:30 – 13:30 30/12/2024) were issued as the system was operating outside the normal operating constraints. The remaining alert, 07:00 – 21:00 24/01/2025, was issued due to the MET office notification of a RED weather warning.

Overall, the winter was mild leading to lower than expected peaks. Daily and weekly engagements between EirGrid (Ireland), SONI (Northern Ireland), National Grid (Great Britain) and other TSOs in the region were highly effective in leveraging the benefits of interconnection.

North Macedonia

Summer Outlook 2025

No adequacy issues are expected for Summer 2025.

Winter Review 2024-2025

No adequacy issues were recorded during Winter 2024-2025.

Norway

Summer Outlook 2025

No adequacy issues are expected for Summer 2025.

Winter Review 2024-2025

No adequacy issues were recorded during Winter 2024-2025.

Poland

Summer Outlook 2025

Input data

For Summer Outlook 2025, PSE provided energy limitations concerning lignite availability, which is especially targeted at one of the lignite power plants (capacity of around 1000 MW). This is the result of depleted lignite stocks and the upcoming closure of the power plant. These constraints limit the available capacity and amount of possible generation for this power plant significantly. For the two remaining lignite power plants, lignite supply restrictions shall not impact the available generation capacity, while the total possible generation of these plants might be slightly limited.

As for the previous outlooks, to avoid an incorrect picture of the situation with the possible level of Polish import/export, PSE provided an estimate of allocation constraints for the analysed period. Given the fact that the current fuel supply situation is significantly better than in previous seasons, these constraints are much less conservative. It is, however, important to recall that the actual allocation constraints are calculated on a daily basis, with the best available up-to-date information, and might differ from the estimated values provided for Summer Outlook 2025.

Adequacy situation / downward regulation

No adequacy issues are expected during the coming summer. However, due to ongoing RES development observed, PSE expects downward regulation problems on days with high RES generation – for PV in particular. It is expected that that situation will be worse than in previous seasons and these problems will occur not only on days with low demand but during weekdays as well. Switching off PV installations will be necessary, and PSE foresees using the following countermeasures to manage RES overproduction:

- Centrally dispatched unit reduction (temporarily below technical minimum, power plant or unit)
- Pumped-storage PP manual activation (if no market contracts)
- Non-centrally dispatched unit reduction order (below thermal production required programme)
- Non-market reduction of RES
- Emergency exchange (export) as the last resort

It is worth mentioning that PV curtailment has become a big challenge as most capacity is disconnected from the 110 kV and medium voltage networks – and sometimes can be performed only manually. Detailed downward analysis will be performed over the week ahead and operational planning horizon.

Winter Review 2024-2025

On 6 November 2024 (Wednesday), for the second time in the history, PSE announced system stress events on the Polish Capacity Market between 16:00 and 19:00. This was a procedure, triggered due to the forecasted reserves lower than necessary for that evening peak confirmed during the early morning of 6 November. The unfavourable forecast of the power balance was caused by a forecast of very low RES infeed (only 0.8% of installed wind and solar capacity), outages of the Polish thermal generating units as well as low / no import coming from the day-ahead market (16:00-17:00 / 17:00-19:00). The forecasted low level of system reserves allows PSE, in line with the Poland's ordinance on the Capacity Market, to announce the aforementioned system stress events in order to trigger additional deliveries activated via the Capacity Market (both generation and demand side). The activation allowed PSE to successfully operate Polish power system during these hours.

PSE experienced downward regulation problems on days with high RES infeed - for PV in particular. Compared to previous seasons, it happened not only on days with low demand but during weekdays as well. Switching off PV installations was necessary to maintain secure operation of the system.

Portugal

Summer Outlook 2025

No adequacy issues are expected for Summer 2025.

Winter Review 2024-2025

No adequacy issues were recorded during Winter 2024-2025.

Romania

Summer Outlook 2025

For summer 2025, under high temperature conditions, we estimate high electricity consumption for the evening peak, comparable to last summer and last winter, which will lead to high electricity import and possible congestions on the AT - HU - SK borders, which will lead to high electricity prices on the Day-Ahead Market (SDAC) in the South-Eastern part of Europe (Romania, Bulgaria, Greece).

With regard to the energy resources of the Republic of Moldova and Ukraine, we consider that part of their needs will be supplied through Romania.

Winter Review 2024-2025

During the period November 2024 - January 2025, the weather conditions were of a mild winter. In spite of this, Romania was a net importer at peak load, the import needs were of about 3000 MW, which represented about 35% of the peak consumption.

In February 2025, due to genuine winter weather conditions, all coal units of Complex Energetic Oltenia were required to operate, the production of the coal power plants increased to 1500 MW, which contributed to improving the adequacy of the Romanian national energy system. The withdrawal of natural gas from storage was sustained, but in spite of this Romania had to import large quantities of natural gas. Hydrological resources were at an average level. Under the conditions described above, the import requirement was of 3000 MW, which represented about 33% of peak consumption.

Throughout the winter period, Romania ensured conditions for electricity exports to the Republic of Moldova and Ukraine, which led to an impact on the adequacy level and security of Romania's electricity supply. Romania's efforts to support the Republic of Moldova were intensified after 01.01.2025, when the supply of natural gas to the Republic of Moldova was stopped, which led to the reduction of electricity production from CERS Moldovenească power plant (located in Transnistria).

It should be noted that as of 01.01.2026, all coal units should be shut down, in accordance with the decarbonization plan assumed by the Romanian Government, which will lead to worsening the adequacy of the Romanian national energy system for 2026.

Serbia

Summer Outlook 2025

No adequacy concerns are anticipated for Summer 2025. In addition to stable thermal and hydro capacities, wind generation is expected to provide a meaningful contribution, particularly during night and early morning hours when demand is lower. The number of solar PV installations connected to the distribution network continues to increase steadily, contributing to the reduction of net system demand during daytime hours.

Planned maintenance of generation and transmission assets has been scheduled outside of peak load periods and is not expected to impact system operation. Interconnections with neighbouring countries provide additional security in case of supply imbalances. Based on current assessments, the Serbian power system is expected to operate in a stable and reliable manner throughout the entire summer.

Winter Review 2024–2025

The Serbian power system operated reliably and securely throughout Winter 2024-2025. Despite lower temperatures recorded in February across the South-Eastern region of Europe, the system successfully met consumption needs. Adequacy was ensured through a combination of generation — thermal, hydro and wind power — and cross-border imports. No system disturbances were reported, and there was no need for the activation of extraordinary operational measures. Balancing was managed within standard market and operational procedures.

Slovakia

Summer Outlook 2025

No adequacy issues are expected for Summer 2025.

Winter Review 2024-2025

No adequacy issues were recorded during Winter 2024-2025.

Slovenia

Summer Outlook 2025

No adequacy issues are expected for Summer 2025.

Winter Review 2024-2025

No adequacy issues were recorded during Winter 2024-2025.

Spain

Summer Outlook 2025

No adequacy issues are expected for Summer 2025.

High renewable energy production is forecasted. In addition, the level of hydro reserves (80% at the end of April) is higher than the mean reference value of the last ten years.

Winter Review 2024–2025

No lack of supply took place in the Spanish peninsular system during Winter 2024-2025.

However, tight adequacy margins were reached, during December 2024.

On the third week of December, the combination of high demand due to low temperatures, low renewable infeed and a high number of unplanned outages of thermal power plants led to near scarcity situations. Red Eléctrica activated the Active Demand Response Service on 11 December and 12 December, in the timeframe between 18:30 and 21:00 on both days. Active Demand Response Service is a specific balancing product for demand, designed to be applied to tackle shortages of balancing reserves.

Concerning temperatures, last winter has been generally classified as mild. In the Spanish peninsular system, the average temperature was 1.2 °C above the reference for this season.

Despite that, demand increased substantially with respect to the previous winter (+2%). Thus, a peak load of 40 GW was reached on the 15 January, which is the highest demand reached since the episode of the snowstorm that took place in January 2021.

Sweden

Summer Outlook 2025

No adequacy issues are expected for the forthcoming summer, with higher levels of hydro reserves than usual.

Similar to Summer 2024, there will be several limitations in transmission. For example, the interconnector to eastern Denmark will undergo maintenance, thereby influencing capacity. In addition, transmission will be limited from both northern and southern Sweden due to maintenance on several occasions during the summer. Nevertheless, no adequacy issues are expected for the upcoming summer, although the annual power plant maintenances and limitations of interconnectors will reduce the flexibility of the power system.

Winter Review 2024–2025

No lack of supply took place in the Swedish system during Winter 2024-2025. The temperatures led to an unusually mild winter in general. There was a higher export volume to neighbouring TSOs compared to the previous winter. The Peak-Load reserve was put on "higher preparation" on two occasions, however no activation was needed.

Switzerland

Summer Outlook 2025

No adequacy issues are expected for Summer 2025.

Winter Review 2024–2025

Since the beginning of the measurements in 1864, Switzerland experienced one of its ten mildest winters. The insolation was often close to the norm. Lack of precipitation during most of the winter months led to very low snow reserves. This resulted in low hydro storage and run-of-river production. Despite more PV infeed, Switzerland had to import more energy than during Winter 2023-2024.

Turkey

Summer Outlook 2025

No adequacy issues are expected for Summer 2025.

Winter Review 2024-2025

No adequacy issues were recorded during Winter 2024-2025.