

A background network diagram consisting of numerous white and light blue circles of varying sizes connected by thin white lines, set against a teal gradient background.

Summer Outlook 2024

**Winter Outlook 2023-2024
Review**

Country Comments

A white outline map of Europe, showing the continent's borders and major islands, positioned in the lower half of the page.

entsoe

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 country comments on the expected adequacy situation or specific operational conditions during the coming season.

The aim of the retrospective reviews is to present the most important events that occurred during 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 any 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 2024

The Summer Season of 2024 is expected to be a normal one, within average historical values of demand and generation. Demand will be mainly supplied by hydro and solar generation, interconnection tie lines and the import contract of the distribution system operator (DSO). OST does not foresee any adequacy issues for this summer.

Winter Review 2023-2024

During the winter of 2023-2024, no adequacy issues were recorded. The availability of the production was high. Demand was higher compared to the previous winter. With the start of the winter season 2023-2024, Albania has switched to energy export regime.

Austria

Summer Outlook 2024

No adequacy issues are anticipated for summer 2024. However, due to Austria's central location in Europe, it remains highly dependent on developments in neighboring countries. Therefore, the overall adequacy situation will be closely monitored.

Prolonged heat waves and adverse climatic conditions, such as elevated temperatures, could potentially present stress factors for summer 2024. These conditions may lead to a significant reduction in production from hydroelectric plants, particularly run-of-river installations. Additionally, elevated temperatures could affect the efficiency of some thermal units in Austria.

Winter Review 2023–2024

The meteorological winter (December, January, February) was predominantly warmer than average, with cold weather phases occurring only at the beginning of December and sporadically in January. February was particularly extreme, being the warmest February on record, with temperatures for extended periods comparable to an above-average March. Notably, the five warmest winters in the 257-year measurement history occurred recently: 2006/07, 2023/24, 2019/20, 2013/14, and 2015/16. Preliminary evaluations indicate that the winter of 2023/24 in Austria was 2.8 degrees Celsius above the average for the 1991 to 2020 climate period.

Nationwide, the winter of 2023/24 brought approximately 50 % more precipitation than average. Due to climate change, rising temperatures, and increased precipitation in the form of rain during the winter months, hydropower has become increasingly important during this period. As of the end of April 2024, the energy stored in the reservoirs within the APG control area was around 16 % of the maximum storage volume.

Typically, renewable production, especially hydropower, declines sharply in the winter months, making Austria reliant on imports. However, the previous winter showed a remarkable reduction in import dependency. In December, Austria imported 194 GWh of electricity, the lowest import balance since 2011. In January and February, Austria was a net exporter of electricity for the first time since 2003.

Natural gas reservoir filling levels were at 75 % as of the end of April, which is above the average for that time of year.

Belgium

Summer Outlook 2024

Following our internal assessments for this summer, Elia foresees export needs theoretically amounting to up to 7 GW. These values are obtained on days with high wind and ample sun, combined with reduced load on summer weekends and bank holidays. These export needs are foreseen to be higher than in 2023 due mainly to the full availability of our non-flexible nuclear units, the increase in installed capacity of wind and PV generation (+2.6 GW PV installed compared to summer 2023) and the unavailability of the Basin I of our hydro pump station in Coe. Therefore, Elia expects more frequent wind curtailment (from market parties or Elia) as well as nuclear modulation. In light of these internal studies, Elia also set up a local action plan with market parties and surrounding TSOs with a focus on:

- Improving the forecasting of the risks and informing BRPs about them;
- Optimizing our export capacity both in DA and ID when needed; and
- Monitoring the availability of reserve sharing with neighboring TSOs.

Elia does not foresee any adequacy issues for this summer as the power plant availability forecast remains reasonably high.

Winter Review 2023-2024

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.

Bosnia and Herzegovina

Summer Outlook 2024

No adequacy issues are expected for the summer of 2024.

Winter Review 2023-2024

No adequacy issues were recorded during the past season.

Bulgaria

Summer Outlook 2024

Due to the expected market conditions during the upcoming summer of 2024 and the large share of PV generation in the production mix, which has displaced a big part of the thermal units, Bulgaria will rely on imports during early mornings and evenings and export energy during noon and afternoon hours. The very important PSHPP Chaira will remain unavailable until the end of 2024. Nevertheless, we do not expect scarcity situations or tight periods.

Winter Review 2023-2024

Winter went without any adequacy issues, though most of the thermal fleet was not contributing much, primarily due to the unfavourable market prices and CO2 emission taxes. Thankfully, the water in the reservoirs was enough and together with import during peak hours we managed to cover the peak demand and compensate for the unavailability of the PSHPP Chaira – a valuable asset and the largest pumped storage hydropower plant in Bulgaria.

Croatia

Summer Outlook 2024

According to the experiences from previous years, higher imports are expected during the summer period. Reasons for that are higher demand, generating units' maintenance and low level of hydro storage. However, Croatia is well connected with neighbouring transmission systems to provide the necessary electricity supply.

Winter Review 2023-2024

There was no significant adequacy issue during the winter of 2023/2024.

Cyprus

Summer Outlook 2024

It is unlikely that Cyprus will experience adequacy issues during the summer of 2024. However, because Cyprus is an isolated island, there is a small probability that adequacy issues could arise through a mix of unplanned outages and unfavourable weather conditions.

Winter Review 2023-2024

Weather conditions were overall mild during the winter period, which was favourable for adequacy. There were multiple periods with low replacement reserve availability, due to a significant number of unplanned outages. In several of these cases, the available replacement reserve was insufficient to cover the loss of the largest synchronised generator.

Moreover, in the coldest period of the winter, the TSO issued public warnings for the possibility of cyclic load shedding on 02/02/2024 due to multiple unplanned outages of old heavy fuel oil generators. However, no adequacy issues materialised.

In all of the above-mentioned cases, the NRA was formally notified.

Czech Republic

Summer Outlook 2024

No adequacy issues are expected for the summer of 2024.

Winter Review 2023-2024

No adequacy issues were recorded during the past season.

Denmark

Summer Outlook 2024

No adequacy issues are expected for the summer of 2024. The three power plants, which were reactivated in 2023, are being decommissioned as of September 2024.

Winter Review 2023-2024

No adequacy issues were recorded during the winter of 2023-2024.

Estonia

Summer Outlook 2024

No adequacy issues are expected for the summer of 2024.

Winter Review 2023-2024

No adequacy issues were recorded during the past season.

Finland

Summer Outlook 2024

In the summer, the electricity demand is expected to be significantly lower compared to the winter. However, the capacity is also lower due to the annual maintenance of power plants and interconnectors. The power plants undergo regular maintenance, but the interconnector capacity is unconventionally low in the upcoming summer. There is a 1000 MW decrease in capacity between Finland and Sweden for a few months due to the maintenance of different transmission links and a 650 MW decrease between Finland and Estonia due to a failure estimated to last until September. Interconnector outages reduce the flexibility of the power system and volatility in the market is expected to be high. However, no adequacy issues are expected for the summer of 2024.

Winter Review 2023-2024

During the past winter, there was a prolonged period of very severe frost across Finland and several outages caused challenges to the power system. Despite the high market prices and price peaks, the system remained stable, and no adequacy issues were recorded. However, the margins were low, especially in the first week of January when peak consumption was reached. Compared to previous years, there was a clear change in the consumption profile as the difference in consumption between day and night decreased significantly.

The unplanned outages of power plants occurring in the winter were mainly short-lasting. The Balticconnector gas pipeline between Finland and Estonia was damaged in October 2023 and the repair lasted through the winter. Moreover, the Estlink 2 transmission link with a capacity of 650 MW failed on 26 January 2024. Even though these two transmission failures posed a risk to the adequacy of electricity both electricity and gas capacity remained sufficient.

The first week of 2024 was the most challenging, with freezing temperatures and nearly 1500 MW of thermal capacity being unavailable, 900 MW of which were unplanned outages. The average consumption of the week was 13 777 MW, the highest weekly average ever recorded in Finland. Consumption was at its highest level during Wednesday and Thursday. On Friday, record-high electricity prices and demand-side flexibility decreased consumption, which was on average 800 MW lower than forecasted. The average price on Friday was a record-high 890.54 €/MWh and the highest peak was 1890.00 €/MWh.

The peak demand hour was recorded on 3 January 2024 between 19:00 and 20:00 EET (Eastern European Time). Demand reached 14 993 MWh/h, only 100 MW lower than the all-time high electricity demand in Finland. During the peak demand hour, the domestic electricity production was 12 112 MWh/h and net imports were 2 881 MWh/h. As in the previous winter, all-time high electricity production was also reached during this winter on 26 January 2024 between 18:00 and 19:00 EET. The new record was 14 246 MWh/h, over 1000 MWh/h higher than the record for winter 2022–2023.

France

Summer Outlook 2024

No adequacy issues are expected on the upward margins but there is a risk on the downward margins due to the low electric demand encountered during the summer. Furthermore, during low electric demand situations, episodes of high tension can be generated.

Winter Review 2023-2024

No adequacy issues were recorded during the winter of 2023-2024.

The electricity production of all carbon-free sectors (nuclear, hydro, wind, solar) shows clear progress compared to the winter of 2022-2023.

The French nuclear power plants recovered higher availability during the winter, even if it remained behind the pre-crisis years.

Hydroelectric production remained the second largest electricity production sector thanks to abundant rainfall, making it possible to maintain high stock levels.

Finally, a decrease of electric demand has still been recorded (-7 % compared to the pre-crisis years), making it easier to cover demand, continuing the dynamics observed in winter 2022-2023.

Germany

Summer Outlook 2024

Based on the knowledge at the time of data collection, the German non-market resources contain as of May 2024:

- Capacity reserve: Since 1 October 2022 and until 30 September 2024, a total contracted capacity of 1.1 GW (growing to 1.2 GW from 1 October 2024) 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: It is used to resolve congestion and contains different types of power plants in Southern and Western Germany. Currently, it comprises a total capacity of 8.7 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 0.9 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 have primarily a different purpose than coping with resource adequacy risks, such as congestion management. Therefore, non-market resources may already partly be exhausted for their primary purpose and may not be available for resource adequacy purposes.

Power plants in the former supply reserve – i.e., certain units of former lignite stand-by, which had been transferred into the supply reserve (from 1 October 2022 to 31 March 2024) – were finally decommissioned at the end of March (comprising an installed capacity of 1.8 GW).

As described in the German Country comments for the Winter Outlook 2023/24, additional power plants with a total installed capacity of 7.5 GW returned to/stayed in the electricity market for the winter period to ensure security of supply. Of this, 4.2 GW were transferred back to the grid reserve as of 1 April 2024. The remaining 3.3 GW were decommissioned.

This currently results in increased price-related imports of energy during hours with low national renewables feed-in. Based on the experience from 2023, the German TSOs expect an increase in imports due to increased maintenance of conventional power plants in the summer.

The pumped-storage power plants (PSPs) of the “Kraftwerksgruppe Obere Ill-Lünersee” (turbine capacity: 2.1 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 Kühtai and storage power plant Silz (total turbine capacity: 0.8 GW; total pumping capacity: 0.25 GW) are also included in the German dataset.

The forecasted load was estimated to be 509 TWh for 2024 in Germany. The peak demand is 87.5 GW for the whole year 2024; for the summer period (27 May to 6 October), it is 73.5 GW. The load can be considered relatively moderate, as new consumers (e.g. heat pumps and electric vehicles) didn't reach the estimated numbers from the years before. Besides that, the economic development due to the energy crisis generally leads to reduced consumption. Hence, no critical impact on resource adequacy is expected.

Figure 4 in the report does not display all changes in NGC during the modelling period (27 May to 6 October 2024) as capacity evolution is partially (e.g. solar) only provided with yearly resolution in PEMMDB for Germany.

Winter Review 2023-2024

Over the winter of 2023/24, neither the national winter monitoring nor the national or pan-European-coordinated resource adequacy forecast of operational planning processes revealed any critical resource adequacy concerns. Also, the national tracking of power plant outages did not reveal any relevant forecast overruns.

Several aspects supported a high level of supply security. Firstly, as described in the German Country comments for the Winter Outlook 2023/24, different reserve power plants (comprising 9.3 GW), were allowed to take part in the market to ensure security of supply. In addition, a general national load reduction due to implemented energy efficiency measures and an ongoing tense economic situation had a positive impact. Therefore, due to favourable weather conditions, no generation adequacy problems occurred.

Due to the mild winter, the gas storage facilities are with about 64% as of 1 April 2024 well filled.

Great Britain

Summer Outlook 2024

Security of Supply

We are confident of meeting our world-leading reliability standards throughout summer 2024. We are confident there will be sufficient supply to meet peak demand, and our positive reserve requirement, throughout the summer and expect to be able to support exports to neighbouring European countries if needed.

Managing the system

We are confident that we can use our existing tools to manage system operability during periods of low demand this summer. Our everyday actions include trading on the interconnectors to reduce imports or pumping and charging storage assets to increase demand.

The ESO's full summer outlook publication is available [here](#)¹.

Winter Review 2023-2024

This winter was typically mild, with temperatures above seasonal normal on 64% of days. Wind outturn, whilst variable, was also above seasonal normal expectations. There were two prolonged periods where temperatures remained below seasonal normal for an extended period. Weather-corrected demand, outturn demand, interconnector flows, and generator availability were broadly in line with ESO seasonal forecasts. The ESO will be publishing a full winter review in June 2024.

¹ <https://www.nationalgrideso.com/document/316126/download>
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Greece

Summer Outlook 2024

For the upcoming summer, there is no scheduled maintenance of generation units during the high-demand period (20 June to 20 August). The possibility of extending scheduled unit maintenance within the high-demand period is low. Two new thermal units, with a total installed capacity of 1400 MW, are expected to be commissioned in the system within the 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 an emergency. The operation with alternative fuel is limited to a few days, only considered as an urgent countermeasure in case of a lack of gas supply, not a continuous operation mode.

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

The total NTCs in the northern border have increased due to the new interconnection line between Greece and Bulgaria (Nea Santa – Maritsa). There are no scheduled maintenance or capacity limitations on the other interconnection lines for the upcoming high-demand period.

Consumption during the upcoming summer is expected to reach the summer 2023 level or be higher due to the worsening environmental conditions.

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

New 150kV and 400kV OHL and HVSS are 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 no adequacy issues are 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 during high-demand peaks.

Regarding Crete Island, the DC connection line between the mainland Greece Transmission System and the Crete Island Transmission System will be in operation by 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 the Crete Island Transmission System and assure adequacy for the summer season.

Winter Review 2023-2024

In context, last winter was mild and dry while the average consumption increased by 2 % in comparison to winter 2023 (which was the lowest in the last 15 years).

Limited snowfall and rainfall resulted in lower water reservoir levels than expected.

No exceptional incidents were recorded.

Energy surplus incidents due to high-RES production in the DSO grid resulted in unexpected RES curtailments in several cases.

No adequacy issues were recorded.

Hungary

Summer Outlook 2024

Based on previous years' system loads and observed typical trends, we do not expect a new peak, except in extreme weather conditions. In recent years numerous PV plants have been added to the Hungarian power-plant park. However, no major conventional power plants have been installed, and import is almost constantly required. The continuously increasing PV generation in the Hungarian system can cause higher uncertainty in operational planning periods and real-time system operation, which causes a higher level of reserve requirement. The utilisation of conventional power plants can be overall lower than in the previous summer since specific market situations such as negative Clean Spark Spread can make it economically unprofitable for some of the power plants to operate. While the level of maintenance is a bit higher than in previous years, it is carefully distributed in time. Furthermore, our reserve procurement methodology has been renewed and is being continuously improved to match current challenges and conditions. As a result, the amount of balancing capacity expected to be available is sufficient to secure the estimated reserve requirement and to guarantee 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 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 2023-2024

Compared to the previous year, a higher load was observed in the winter period of 2023-2024 due to colder weather and market conditions. The maximum load (7441 MW) was reached on 22 January 2024, 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 2024 with a value of 3143 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 850 MW. Alongside this, the all-time highest upward regulation was reached on 25 March 2024, with a value exceeding 1150 MW. This was caused by several simultaneous unplanned power plant outages but managed to be covered nearly entirely by domestic reserves. The utilisation of conventional power plants was slightly lower than in the previous winter, while the level of maintenance was low and carefully distributed in time. During the winter period, IT developments were also introduced, so the amount of balancing capacity available was sufficient to secure the occurring reserve requirement.

Overall, the Hungarian system entered the Alert state on only one occasion due to a shortage of spinning reserves, but this was withdrawn within half an hour. Even though we have faced some difficulties due to weather conditions among other things, the last winter passed without any adequacy issues.

Ireland

Summer Outlook 2024

We expect tight generation margins throughout the summer period at times of low wind generation output, with the highest adequacy risk identified in September. This is driven by two key factors; multiple overlapping planned large dispatchable generator outages, and the lack of new dispatchable generation entering the market to replace old units which have closed and to cover the increase in demand. The actual adequacy situation in Ireland will depend on the operational conditions: unplanned outages of the ageing generation fleet, and especially wind generation. Increased solar penetration will also help mitigate this. Compared to last summer, which showed comparable risks, non-market resources (381 MW) will be available and will significantly alleviate the risks.

Winter Review 2023-2024

Dispatchable generation margins remained tight throughout the winter period. There was one system alert issued due to capacity adequacy reasons (15/11/2023 17:25 to 15/11/2023 18:35). 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.

Italy

Summer Outlook 2024

Upward adequacy assessment

Importing electricity from neighbouring countries is anticipated to be necessary to restore adequacy margins and cover consumption during critical hours (+2.2GW). However, the necessity is expected to be lower than summer.

The main drivers for this improvement are:

- An increase in expected hydroelectric production;
- An increase in available thermal capacity.

Analyses estimate that adequacy risks remain within standard levels.

Critical situations could arise in the unlikely event of a heatwave leading to high demand, reduced imports from neighbouring countries, or a higher-than-typical rate of unplanned outages in generation units.

Postponement and/or cancellation of maintenance activities could serve as countermeasures, along with demand response measures and additional market interventions.

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 capacities in Italy

In 2023, renewable generation capacity increased by approximately 5.2GW, with an additional increase of over 2.5GW in the first months of 2024. There was also an increase in thermal power capacity, attributed to new power plants selected in capacity market auctions and the repowering of existing plants. This expansion facilitated the decommissioning of older and coal-fuelled power plants.

Currently, the total installed renewable capacity (wind, solar, and hydro generation) is around 67 GW, surpassing the thermal capacity, which stands around 62 GW.

Downward regulation assessment

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

Winter Review 2023-2024

During the last winter, the electricity demand increased by approx. 0.4 % as compared to the same period of the previous year. A rise in consumption was registered with respect to the previous year, with an increase in demand (without considering the effect of temperature) of around 1.2 %.

As far as the peak power demand is concerned, winter 2023/2024 saw a 2.4 % decrease with respect to winter 2022/2023.

Compared to last winter, coal production experienced a significant decrease. Renewable generation played a key role in covering the demand, with a historical peak in hourly demand coverage by solar PV and wind energy during the month of March 2024.

Latvia

Summer Outlook 2024

No adequacy issues are expected for the summer of 2024.

Winter Review 2023-2024

No adequacy issues were recorded during the past season.

Lithuania

Summer Outlook 2024

At the beginning of this summer season the net generating capacity in Lithuania will be 5591 MW. The most noticeable changes can be seen in the renewable energy sources generation. Compared to last year's summer season, the net generating capacity of wind has increased by 23 %, and solar by 52 %. These numbers will be rising through the summer until the end of the year, due to the rapid growth of solar power and the additions of new wind parks. Starting from 13 May until 15 June, Mažeikiai PP G-2 (55 MW) will be in maintenance as well as Lithuanian PP CCGT (442 MW), starting from 17 to 19 July. To ensure isolated operation in 2024, Litgrid has production availability reserves of 1092 MW.

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

Winter Review 2023-2024

During the last winter, national consumption was 7 % higher than in winter 2022/2023. The maximum total load (2267 MW) was reached on 8 January 2024.

The winter balance portfolio consisted of 41 % local generation and 59 % imports from the neighbouring countries. The largest import provider this winter was Sweden. Litgrid has imported 16 % more electricity from Sweden than in the previous winter season. Solar generation increased by 243 % and wind generation by 76 % compared with last year's winter. The main reason why local generation was higher than usual winter seasons was growth of renewable energy sources, with an increase in wind net generating capacity by 34 % (310 MW) and solar by 230 % (558 MW), compared to last year's winter season.

Imports contributed significantly to adequacy in Lithuania.

Luxembourg

Summer Outlook 2024

No adequacy issues are expected for the summer of 2024.

Winter Review 2023-2024

No adequacy issues were recorded during the winter of 2023/2024.

Malta

Summer Outlook 2024

Demand projections calculated by ENTSO-E are lower than actual expected demand. However, no adequacy issues are expected in Malta for the Summer Outlook 2024.

Malta also has an additional 215 MW of non-market resources in the form of emergency gas oil-fired back-up plants available for dispatch at any time to meet local demand and/or abrupt scenarios which may arise.

Winter Review 2023-2024

No adequacy issues were recorded during the past season.

Milder winter and higher temperatures than previous winter resulted in a lower peak demand.

Montenegro

Summer Outlook 2024

No adequacy issues are expected for the summer of 2024.

Winter Review 2023-2024

No adequacy issues were recorded during the past season.

Netherlands

Summer Outlook 2024

No adequacy issues are expected for the summer of 2024.

Winter Review 2023-2024

No adequacy issues were recorded during winter 2023/2024.

Northern Ireland

Summer Outlook 2024

No adequacy issues are expected for the summer of 2024. There is a risk of tight margins in late summer if the expected new generation capacity is not available.

Winter Review 2023-2024

Dispatchable generation margins remained tight throughout the winter period. There was one system alert issued due to capacity adequacy reasons on 15/01/2024 from 18:30. 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 2024

No adequacy issues are expected for the summer of 2024.

Winter Review 2023-2024

No adequacy issues were recorded during the past season.

Norway

Summer Outlook 2024

No problems are expected during the summer, but there is a small worry about too little rotating reserves (inertia) during periods with high import. To solve this, measures are taken to buy more fast frequency reserves. The predictions for buying such reserves are uncertain.

Winter Review 2023-2024

No problems were experienced during the winter, and we do not anticipate any shortages during the spring either. Hydro reservoirs are a bit lower than normal, but the snow reservoirs are rather higher than normal.

Poland

Summer Outlook 2024

Input data

For the Summer Outlook 2024, 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 winter, to avoid providing 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 the previous seasons, these constraints are much less conservative. It is however to be recalled that the actual allocation constraints are calculated daily, with the best available up-to-date information, and might differ from the estimated values provided for Summer Outlook 2024.

Adequacy situation

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 - PV in particular. It is expected that that situation will be worse than the previous seasons and these problems will happen not only on days with low demand but during weekdays as well.

Switching off PV installations might be necessary then (as the very last measure according to 2019/943 Regulation Article 13.6. (a) "power-generating facilities using renewable energy sources shall only be subject to downward redispatching if no other alternative exists or if other solutions would result in significantly disproportionate costs or severe risks to network security") to recover downward regulation possibility just after energy emergency exchange to the neighbouring TSO will be exhausted.

It is worth mentioning that PV curtailment has become a big challenge as most capacity is disconnected from the 110 kV & 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 2023-2024

PSE experienced downward regulation problems on days with high RES infeed - PV in particular. Compared to the previous seasons, it happened not only on days with low demand but during weekdays as well. Switching off PV installations was necessary (as the very last measure according to 2019/943 Regulation Article 13.6. (a) "power-generating facilities using renewable energy sources shall only be subject to downward redispatching if no other alternative exists or if other solutions would result in significantly disproportionate costs or severe risks to network security") to recover downward regulation possibility just after energy emergency exchange to the neighbouring TSO were exhausted.

Portugal

Summer Outlook 2024

In the Portuguese National Adequacy Assessment Monitoring Report (RMSA-E 2023), load reduction needs (market balancing products for eligible consumers with whom there should be annual contracts for the provision of this service) were identified for 2024, depending on hydro conditions. For this purpose, an auction for a specific market balancing annual product was launched by the Portuguese NRA resulting in 306,6 MW to be available during 2024. This measure was needed once until now. Moreover, due to system operational needs identified by the TSO, it was possible to maintain in operation during 2024 an old CCGT power plant that was to be decommissioned in March. Given these two measures as well as hydro storage levels that are at a ten-year high, no adequacy issues are expected to occur during the summer season. However, it is very likely that system operation will have to deal with some solar and wind curtailment.

Winter Review 2023–2024

During the last winter season, hydro inflows were significantly above the average, so the hydro generation availability was high. Accordingly, there were no difficulties for system adequacy and no notable critical situations occurred.

Romania

Summer Outlook 2024

No adequacy issues are expected for the summer of 2024.

Winter Review 2023–2024

No adequacy issues were recorded during the past season.

Serbia

Summer Outlook 2024

No adequacy issues are expected for the summer of 2024.

Winter Review 2023–2024

No adequacy issues were recorded during the past season.

Slovakia

Summer Outlook 2024

No adequacy issues are expected for the summer of 2024.

Winter Review 2023–2024

No adequacy issues were recorded during the past season.

Slovenia

Summer Outlook 2024

No adequacy issues are expected for the summer of 2024.

Winter Review 2023–2024

The winter was mild, without long periods of extremely low temperatures and almost without snow precipitation. Our Nuclear plant Krško was in unplanned maintenance from 6 October to 17 November 2023 due to identified leakage in the primary circuit. During the same period, from 13 November till 17 November 2023, our biggest thermal power plant TEŠ6 was also out of service due to a coal shredder malfunction. Thus, our two biggest power plants were simultaneously unavailable, posing a potential risk in ensuring the security of supply. Consequently, we had to rely merely on our import capacities, which were luckily high enough not to endanger meeting our energy demand in that period.

Spain

Summer Outlook 2024

No adequacy issues are expected for the summer of 2024, even in the case of high load due to heat waves.

Large availability of conventional power units and high renewable energy production are foreseen. Furthermore, the level of hydro reserves (75 % at the beginning of April) is higher than the mean reference value of the last ten years.

Winter Review 2023–2024

No adequacy issues were recorded during the winter of 2023-2024.

Last winter has been one of the mildest concerning temperatures since the beginning of the measurements in 1961. In the Spanish peninsular system, the average temperature was 1.9 °C above the reference for this season.

Conversely, demand increased for the previous winter (+1 %) but is still not close to pre-crisis levels.

Hydropower production has experienced a significant increase (+49 % compared to the previous winter) as hydro reserves have remained above the mean reference value of the last ten years since October.

Sweden

Summer Outlook 2024

No adequacy issues are expected for the summer of 2024.

Winter Review 2023–2024

The winter of 2023-2024 was the coldest since 2013. The peak load reached 25 200 MWh/h, which is higher than the previous year but at the same time lower than expected in relation to the cold weather. This can be partly explained by the change in behaviour seen since 2022, where customers use less electricity.

Svenska kraftnät has been able to ensure high transfer capacities from northern to southern Sweden, which contributes to adequacy in the southern parts of Sweden. Higher availability for Nordic nuclear power and improved conditions for import also contributed to making the winter 2023-2024 overall more stable from an adequacy perspective than the previous winter. No adequacy issues occurred during the winter, and the strategic reserve was never activated. However, the strategic reserve was set to maximum readiness (no startup time) four times and heightened readiness (startup time reduced to two hours) 11 times. This is more than last year and depends on the conditions at the time, such as cold weather, forecast uncertainty and bottlenecks in the grid.

Switzerland

Summer Outlook 2024

No adequacy issues are expected for the forthcoming summer.

Winter Review 2023–2024

Since the beginning of the measurements in 1864, Switzerland experienced its mildest winter. December 2023 was the fifth mildest month of December, and February 2024 was the mildest month of February. The winter of 2023/2024 was characterized by strong precipitations, and insolation was below average in most regions.

The aforementioned heavy rainfall and heavy snowfall (between November 2023 and January 2024) have led to a significant increase in Switzerland's hydrological water reserves; this yielded a favourable initial position for Switzerland's supply as well as net exports in January 2024. Swiss security of supply was ensured during the entire winter.

Because of very high French exports and German imports, Swissgrid had to use more redispatch energy than during the previous winter to reduce the high unscheduled flows crossing the Swiss transmission grid and hence ensure grid security.

Since February 2024, high temperatures led to high load flows from South-West Europe (France and Italy) to Switzerland, often prolonged by an export to Germany and Austria. In the mornings and the evenings, the Swiss hydro production was higher than usual, which led to further bottlenecks in the Alps.

The entire winter was characterized by a South-North load flow, a clear increase of grid loading but few outages of grid elements. Switzerland's controllability was always guaranteed.

Turkey

Summer Outlook 2024

No adequacy issues are expected for the summer of 2024.

Winter Review 2023–2024

No adequacy issues were recorded during the past season.

Ukraine

Summer Outlook 2024

Ukraine's national analysis for summer 2024 demonstrates significant risks to the energy system. The system faces planned load-shedding activation for both industrial and household consumers daily. Under these circumstances, urgent efforts are carried out to restore damaged generation capacities and implement small-scale distributed generation connecting to the distribution grid, but also be dispatchable and simultaneously cover local electricity demand. Unpredictable but systematic everyday attacks causing the transportation grid's infrastructure elements damage require Ukrenergo and generation companies' staff's significant effort to maintain the grid and generation units in proper state and operation. The interconnector transfer capacity has reached limits for the current conditions, and options for further increase are explored.