Summer Outlook 2022

Winter Review 2021-2022

country comments

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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 42 member TSOs, representing 35 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 2022

No adequacy issues are expected for the summer 2022.

Winter Review 2021-2022

No adequacy issues were recorded during the past season.

Austria

Summer Outlook 2022

During the summer of 2022, the availability of gas power plants is low due to overhaul work.

Since the beginning of the Ukraine war, the operators of thermal power plants in Austria have been examining the extent to which it is possible to switch to another gas supplier on the one hand and a primary energy switch on the other hand in order to reduce their dependence on Russian gas. Furthermore, attempts are being made to increase the filling level of the Austrian gas storages.

Winter Review 2021-2022

Last winter was eighth warmest winter in the lowlands and twenty-second in the mountains according to the records.

According to the preliminary evaluation by the Central Institute for Meteorology and Geodynamics (ZAMG), the meteorological winter 2021/2022 (December, January, February) in the lowlands of Austria was 1.3 degrees above the average of the last 30 years and 2.6 degrees above the average of the 1961 to 1990 climate period. The winter of 2021/2022 was the sixteenth winter in a row that was warmer than the average of 1961 to 1990.

Due to low precipitation, the hydro production in Austria was far below the average. This gap of production could be compensated with increased imports.

Belgium

Summer Outlook 2022

No adequacy issues are expected for Belgium for the upcoming summer. The Belgian demand is again at the same level as before the Covid pandemic, and the planned outage schedule is very similar to previous years. On the 1 October 2022 the nuclear phase-out starts taking Doel 3 out of operations (1 GW).

Increasing volumes of installed wind and PV, lead to relatively high needs for export in case of good nuclear availability. The excess energy is mainly expected during weekends and the holiday period. The export capacities should be sufficient, however, in some specific cases additional measures may be necessary.

Winter Review 2021-2022

There were no adequacy issues in Belgium during the winter period 2021/2022, due to a good availability of the Belgian thermal and nuclear production park and mild temperatures. Almost whole winter Belgian did not have to rely on import to cover the demand. Belgium was mainly exporting energy to surrounding countries.

Bosnia and Herzegovina

Summer Outlook 2022

No adequacy issues are expected for the summer 2022.

Winter Review 2021-2022

No adequacy issues were recorded during the past season.

Bulgaria

Summer Outlook 2022

No adequacy issues are expected for the summer 2022.

Winter Review 2021-2022

No adequacy issues were recorded during the past season.

Croatia

Summer Outlook 2022

No adequacy issues are expected for the summer 2022.

Winter Review 2021-2022

No adequacy issues were recorded during the past season.

Cyprus

Summer Outlook 2022

Some risks are expected over the summer if weather conditions would be not favourable and it if it would be combined with unplanned outages of thermal units. Weather conditions could drive electricity consumption and reduce renewable generation.

Winter Review 2021-2022

No adequacy issues were recorded during the past season.

Czech Republic

Summer Outlook 2022

No adequacy issues are expected for the summer 2022.

Winter Review 2021-2022

No adequacy issues were recorded during the past season.

Denmark

Summer Outlook 2022

Energinet (TSO in Denmark) expects a stable summer period. If the adequacy risks in Eastern Denmark from the report persist closer to real time, the planned outages may be rescheduled. The power adequacy in Western Denmark (DKW1) and Eastern Denmark (DKE1) is expected to be good during the upcoming summer. There is planned maintenance on power plants and yearly maintenance on the HVDC connections and AC connections to our neighbors in Norway, Germany, Sweden and the Netherlands. The maintenance is expected to be limited and only take a few days.

Energinet has a high number of reinvestments during the summer on 400 kV, 150 kV and 132 kV lines/stations.

Reinvestments of 400 kV lines on the East coast of Jutland in Western Denmark during May-June will affect the interconnectors capacity. However, the adequacy will be largely unaffected.

Reinvestments of 400 kV lines on the borderline between Denmark and Sweden will cause some restrictions. The reinvestment will take place during summer, in short periods.

Reinvestments of 150 kV and 132 kV stations/lines will not affect the capacity on the border connections. There will only be local problems.

Potential critical periods and foreseen countermeasures:

DKW1 and DKE1: Energinet does not expect any problems with downward regulation. Energinet expects the need to countertrade with Germany (TenneT), especially in periods with high wind production.

Winter Review 2021-2022

Denmark, as all of Europe, has seen a significant increase in prices as a consequence of low water levels in the Nordic reservoirs and high prices for fossil fuels. With high prices, many power plants were available in the market leading to a substantial adequacy margins.

Estonia

Summer Outlook 2022

No adequacy issues are expected for the summer 2022.

Winter Review 2021-2022

No adequacy issues were recorded during the past season.

Finland

Summer Outlook 2022

No adequacy issues in electricity are expected for the summer 2022 despite the suspension of electricity and gas supply from Russia to Finland on May 2022. Summer Outlook 2022 simulations support this message as no adequacy issues were identified in Finland. The simulations had no electricity imports from Russia to Finland and also considered annual maintenances and forced outages of power plants and interconnectors.

The lack of electricity import from Russia will be compensated by importing more electricity from Sweden and by generating more electricity in Finland. In energy production, the share of gas is small especially in electricity production and gas can mainly be replaced with other fuels. Finland's self-sufficiency in electricity generation is constantly improving. In particular, the amount of Finnish wind power generation is increasing every year and Olkiluoto 3 nuclear power plant is expected to start regular electricity production on 30 September 2022.

The electricity adequacy is also usually better during the summer season compared to the winter, as electricity demand is lower. Typically, the summer peak demand amounts to 60–70 % of winter peak demand. However, annual maintenances of power plants and some interconnectors are often carried out during the summer period, which leads to less generation capacity available. Unavailability for plants and interconnectors was taken from published outage information during the data collection. The information was not yet available for all power plants, and in such cases outage due to annual maintenance is estimated by the model based on typical maintenance periods and times.

It should be noted that Olkiluoto 3 was expected to start regular production on 1 August 2022 when the data was collected for the Summer Outlook modelling and thus is included in the capacity. The start date has been delayed but trial operations will be run from 20 June 2022 onwards with varying electricity production. Overall, this change is not expected to have a significant impact on adequacy during August-September due to lower demand compared to winter. When further interpreting the capacities published in dataset for Finland, production capacity using peat as a fuel is primarily calculated under the hard coal category.

Winter Review 2021-2022

The adequacy in Finland was not endangered during the winter. No adequacy or downward regulation issues were identified during the season. It is worth noting, however, that there were all-time high prices seen on the balancing and day-ahead market. The demand peak was 14175 MWh and at the time of the peak, the electrical system had a normal operating situation and no significant disturbances. At demand peak, domestic electricity production was 10169 MW and net imports were 4006 MW. Import capacity from Sweden and Russia was fully utilized commercially during peak demand hours, with few exports to Estonia.

Overall, weather and especially temperature has a significant effect on the electricity demand peak in Finland due to electric heating. In terms of temperature, December 2021 was colder than usual while temperatures in early months of 2022 were mild. As a result, the Finnish peak demand hour occurred on 8 December 2021 between 17:00 and 18:00 EET. A demand-weighted average temperature during the peak hour was -17 °C. The demand peak last winter was around the same than the previous year. All-time high electricity demand in Finland is 15105 MWh, which occurred in January 2016 with a respective temperature of -25 °C.

France

Summer Outlook 2022

At this point, with our latest hypothesis and generation units outage planning, no adequacy issue has been detected on upward margins until the end of September (period end of the national summer outlook prepared by RTE, the French TSO). Due to low nuclear availability during the summer period (around 35 GW expected, not taking into account unplanned outages which might results from on-going corrosion check), no downward margin issue is expected at this point. RTE remains pro-active on this topic and will keep under close watch any evolution of the nuclear production units planned outage or any other unforeseen unavailability.

Winter Review 2021-2022

RTE implemented a new dynamic communication system in order to address each specific part of the winter. Three periods were assessed: end of the year until 1 January, January first three weeks and end of winter (last week of January and February).

For each period, RTE based its assessment on two indicators: adequacy stress level and degree of confidence of the forecasts. These indicators have been updated all winter long, a first experiment of dynamic communication that might be used for the next winters as long as adequacy margins remains tight.

Regarding consumption, the COVID pandemic has strongly and durably affected France. Furthermore, daily recorded temperatures have been on average + 0,6°C (Median + 0,4°C) higher than climatic expectations[1]. Although, and even if winter isn't already over, maximum recorded electricity consumption has reached 87 GW [2] (stable and close to 2021 and 2019)[3]

Regarding generation units, Nuclear Power plants planned outage planning have been regularly followed-up by RTE and discussed. Expected planned outages were lower than observed outages. This is the consequence on the one hand of maintenance lasting longer than expected and on the other hand on an actual corrosion check that affects, at least, the PWR-N4 models. At this point the other PWR models are still under investigation. Other generations technologies remain available at a satisfying level.

The French national seasonal adequacy study has been regularly updated and published[4] . Winter 2021-2022 is matching the expectations and hypothesis used in our studies.

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[1] *https://www.services-rte.com/fr/visualisez-les-donnees-publiees-par-rte/previsions-de-consommation.html*
[2] *https://opendata.reseaux-energies.fr/explore/dataset/eco2mix-national-tr/table/?disjunctive.nature&q.timerange.date_heure=date_heure:%5B2021-12-31T23:00:00Z+TO+2022-03-31T21:59:59Z%5D&sort=consommation*
[3] *https://opendata.reseaux-energies.fr/explore/dataset/pic-annuel-conso-brute/table/?sort=date*
[4] *https://www.rte-france.com/analyses-tendances-et-prospectives/les-analyses-saisonnieres#Lesdocuments*

Germany

Summer Outlook 2022

Due to the German nuclear and coal phase-out, there is a continuous reduction of installed conventional power plant capacities.

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 non-market resources for Germany contain:

- Lignite units in stand–by ("Sicherheitsbereitschaft"): Lignite-fired power plant blocks with a total capacity of 1.8 GW are currently in backup mode. The lead time in which the power plants are completely available is 240 hours. These power plants, however, can only be used if the German Federal Government declares an energy crisis in Germany. Therefore, this capacity is actually only foreseen for scenarios out of scope for Seasonal outlooks;

- Grid reserve: Used to resolve congestions and contains different types of power plants located in Germany. Currently, it comprises a total capacity of 5.7 GW;

- Out-of-the-market Demand Side Response: With the Ordinance on Interruptible Load Agreements (AbLaV), interruptible demand can be obliged to take measures to maintain grid and system security. For the purpose of AbLaV, interruptible demand is defined as consumption units, which can reliably reduce their demand for a fixed capacity upon request by the corresponding German TSO. Currently, about 1.5 GW of interruptible demand is available (prequalified amount of power). According to current status, however, on 30st June 2022 the Ordinance on Interruptible Load Agreements expires and therefore no out-of-the-market Demand Side Response capacities will be further available.

- Capacity reserve: Since 1 October 2020 and until 30 September 2022, a total capacity of 1.1 GW of power plants outside the market is available as reserve for unforeseeable events. These power plants must be available within maximally 12 hours and are activated in case of a lack of market clearance (D-1 and ID). They can also be used to resolve grid congestions.

Parts of the above-mentioned non-market resources have primarily a different purpose than coping with resource adequacy risks, such as grid stabilization. In case of adequacy issues in Germany those may already partly be exhausted for their primary purpose. In addition, due to legal constraints the usage of non-market resources is only possible for problems in Germany.

A heat wave (prolonged hot and dry period) could constrain power plant availability because of problems with cooling water supply and high water temperatures or fuel transporting problems due to low river levels.

Extensive conventional power plant unavailability abroad can also affect Germany. No critical periods for maintaining adequacy are expected.

Potentially, the increasing PV generation could lead to high power flows in the German transmission system. In addition, a situation with high wind generation in the north of Germany and a low PV generation in the south could cause high power flows.

The time around Whitsunday could be critical concerning voltage problems due to very low demand. In addition to market-based redispatch, grid reserve power plants are used to solve voltage problems, if

needed. In periods with high renewable generation and low (regional) demand, high power flows on interconnections are expected. In some power flow situations, regional infeed management of renewables might be necessary to maintain system operation security. Nevertheless, no critical situations are expected.

On 1 October 2021, changes in congestion management came into force by means of “Redispatch 2.0”, which refers to the 2019 amendment to the “Transmission System Expansion Acceleration Act” (NABEG). As a result, the feed-in management of both RES (Einspeisemanagement) and CHP plants is continuously incorporated into the redispatch process.

Gas dependency and preparation for Winter 2022-2023

The applied ENTSO-E methodology has limitations in determining the German gas consumption decrease potential. The approach overrates the gas consumption decrease potential in Germany because the modelling is based on a simplified assumption on gas power plants (like CHPs smaller 10 MW, CHPs in industry process, CHPs in district heating networks) and Other-Non-RES.

An internal study by the German TSOs showed a gas consumption decrease potential of approx. 20% of the total gas consumption for electricity generation. The internal study is based on two different simulation runs: a reference simulation with gas prices from end of 2021 and a sensitivity with a significantly higher gas price in order to reflect the current market situation.

Winter Review 2021-2022

According to the time schedule of the German nuclear and coal phase-out several corresponding power plants were decommissioned (among them 3 nuclear power plants) at the end of 2021. This affects the further available controllable capacity accordingly.

Transportation problems for hard coal due to low water levels in the river Rhine and Neckar and other external influences led to reduced availability of affected power plants especially in Southwestern Germany.

High amounts of redispatch measures with activation of (also grid reserve) power plants in Southwestern Germany and partly abroad were necessary to maintain grid security due to high transits.

Great Britain

Summer Outlook 2022

No adequacy issues are expected for the summer 2022.

Winter Review 2021-2022

No adequacy issues were recorded during the past season.

Greece

Summer Outlook 2022

No adequacy issues are expected for the summer 2022.

Winter Review 2021-2022

No adequacy issues were recorded during the past season.

Hungary

Summer Outlook 2022

No adequacy issues are expected for the summer 2022.

Winter Review 2021-2022

No adequacy issues were recorded during the past season.

Ireland

Summer Outlook 2022

Generation margins are expected to remain tight throughout the summer period with risk of the system entering the Alert State at times. The system has entered the Alert State on three occasions since the start of April; 9 April 2022, 12 April 2022 and 5 May 2022.

Winter Review 2021-2022

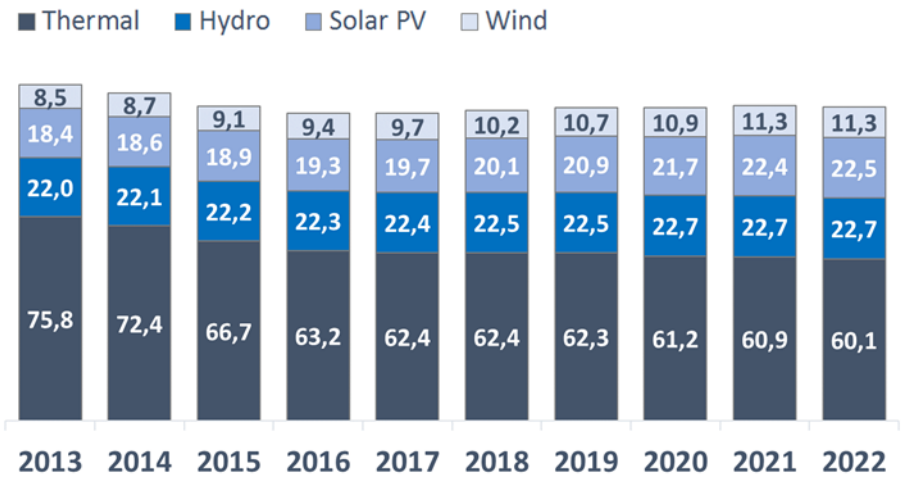
Generation margins remained tight in Ireland throughout the winter period. It was anticipated that the system may enter Alert State at times over the winter period, however, no System Alerts were issued during Winter 2021/2022.

Italy

Summer Outlook 2022

Generation capacity in Italy

In the first half of the last decade, the Italian Power System has faced a significant reduction of the conventional (thermoelectric) power fleet. At the end of 2015, more than 15 GW of thermoelectric power plants have already been phased out. Since 2016 the trend of decommissioning of conventional capacity has proceeded with a reduced pace. Today, the total amount of installed conventional power is around 60,1 GW, while additional 2,1 GW conventional power capacity is not available due to environmental/legal constraints and mothballing.



Annual Installed Capacity per Production Type[5]

The shutdown of several coal power plants expected in the coming months and years (Italy is committed to phase out coal powered generation within 2025), will be on average balanced by new power plants (mainly CCGTs) awarded through capacity market auctions.

New thermal capacity will be commissioned during Summer 2022, with few weeks delay on the previously scheduled dates (see Figure 6: "Capacity evolution in Summer 2022" in Summer Outlook Report 2022).

Grid reinforcements and low capex projects to increase the capacity of existing transmission lines developed by the Italian TSO in the last years also helped to mitigate criticalities caused by the power plants' decommission (especially in the main islands).

As regard the potential gas saving for electricity generation in Italy presented in Figure 17, it's noted that Terna deemed it necessary to fine-tune the statistical Eurostat data on gas consumption used for the analysis to get a more representative view for next winter[6].

Upward adequacy assessment

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[5] *Source: until 2021 "Statistical Data" on electricity in Italy published annually by Terna; from 2022 onward provisional data subject to change.*

[6] *This refinement includes: consolidation of winter 19/20 data including gas consumption over January-March 2020; maximization coal and import from neighboring Countries; energy limitations due to technical constraints, fuel procurement and quality; import set at the maximum historical import.*

Import from neighbouring countries will be necessary to restore adequacy margins. Risk for adequacy is expected in case of reduced net import or if unplanned outages rate of generation units is higher than average. As well, adequacy concerns are identified under potential "extremely dry" scenario, with severely reduced hydro production and unavailability of thermal power plants that use water from rivers for cooling. The probability of this scenario is low at the moment and is continuously being monitored by Terna.

Planned outages may be rescheduled (postponed and/or cancelled) closed to real time operation depending on the situation. Especially, in case of tight adequacy margins materialize in Sardinia in particular weeks, the interconnection planned outage with mainland Italy could be rescheduled.

In addition, improved regional coordination processes (including regional weekly adequacy assessment - STA project and Critical Grid Situation process) will support the definition of proper and efficient countermeasures in case the risk of incurring in critical situations will be detected at short term horizon.

Downward regulation assessment

The worst weeks for downward regulation are expected to be the central weeks of August, the starting and the ending part of the summer period (June and September). In order to cope with this risk, the Italian TSO (Terna) prepared preliminary actions and emergency plans and, in case of need, will adopt the appropriate countermeasures. In order to guarantee system security, Terna could adopt enhanced coordination with neighbouring TSOs and special remedial actions, such as the curtailment of inflexible generation. Further special actions, such as NTC reductions, could be planned in cooperation with neighbouring TSOs.

Winter Review 2021-2022

During last winter, the electricity demand increased by approx. 3.4% as compared to the same period of the previous year.

Electricity consumption increased across all sectors as the economy recovered after the pandemic. Temperature trend slightly influenced the increase in demand, being the winter 2022 moderately colder than the same period in 2021 (on average -0.5 ° C). Without considering the effect of temperature, the rise in demand was around 2.9%.

During the period under review there were no incidents with significant consequences on the electricity system or on the supply of electricity to consumers.

Latvia

Summer Outlook 2022

No adequacy issues are expected for the summer 2022.

Winter Review 2021-2022

No adequacy issues were recorded during the past season.

Lithuania

Summer Outlook 2022

For this summer season net generating capacity in Lithuania will be 3421 MW. Most noticeable changes were made in fossil fuel and renewable energy sources generation. Fossil fuel generating capacity this year is at 77% compared to last year. Wind net generating capacity increased by 24% and solar by 53%. These numbers will be rising through summer and all the way to the end of the year, due to the rapid growth of solar power and an addition of new wind park.

Total volume of frequency restoration reserves for summer season will remain the same at 917 MW.

Isolated test of Lithuanian power system is scheduled to take part on 10 September this year. During the test NTC from Sweden to Lithuania and from Poland to Lithuania will be 130 MW. NTC of HVAC cross-border interconnection and from Lithuania to Poland and to Sweden will be zero.

Since 22 May 2022, there are no active market participants importing and/or exporting electricity from third countries (Belarus and Kaliningrad area).

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

Winter Review 2021-2022

In winter 2021/2022, national consumption was 3,9% higher than in winter 2012/2021. Highest demand (2217 MW) was reached on 8 December 2021.

In general, the winter balance portfolio consisted of 34% local generation and 66% imports from neighboring countries. During the winter 2021/2022, total generation was 1,5% lower compared with the winter 2020/2021. Thermal generation from fossil fuel was reduced by 38,2 %. Wind generation increased 27%, solar power plants production more than doubled (143%) compared with last year's winter. Hydro generation increased by 66,1%. During this winter Lithuania's balance portfolio slightly shifted from increasing its local generation to importing more from neighboring countries especially Sweden, increase of 13,3% and Poland 17,7% accordingly.

Import contributed significantly to adequacy in Lithuania.

Luxembourg

Summer Outlook 2022

No adequacy issues are expected for the summer 2022.

Winter Review 2021-2022

No adequacy issues were recorded during the past season.

Malta

Summer Outlook 2022

No adequacy issues are expected for the summer of 2022, with non-market resources reducing the risk of EENS and LOLE in Malta.

Winter Review 2021-2022

Demand in winter 2022 increased at an average of 11% over 2021, reaching peak demand of 503 MW during week 4. Demand during January to May 2021 was low due to the lingering effect of COVID-19.

Scheduled maintenance on one of the local power plants was delayed by almost two weeks in March 2022 due to an incident on the Interconnector because of bad weather. The Interconnection with Sicily was not disrupted, and Interconnector is still being dispatched up to its full capacity. Further studies need to be made to identify all the damages involved.

Scheduled works of another local power plant were postponed by a month and shall commence at the beginning of May 2022.

Upgrade of 37 MW emergency plant originally scheduled to start in April 2022 has now been rescheduled to start in October 2022.

Montenegro

Summer Outlook 2022

No adequacy issues are expected for the summer 2022.

Winter Review 2021-2022

No adequacy issues were recorded during the past season.

Netherlands

Summer Outlook 2022

No adequacy issues are expected for the summer 2022.

Winter Review 2021-2022

No adequacy issues were recorded during the past season.

Northern Ireland

Summer Outlook 2022

No adequacy issues are expected for the summer 2022.

Winter Review 2021-2022

No adequacy issues were recorded during the past season.

North Macedonia

Summer Outlook 2022

No adequacy issues are expected for the summer 2022.

Winter Review 2021-2022

No adequacy issues were recorded during the past season.

Norway

Summer Outlook 2022

No adequacy issues are expected for the summer 2022.

Winter Review 2021-2022

No adequacy issues were recorded during the past season.

Poland

Summer Outlook 2022

No adequacy issues are expected for the summer 2022.

Winter Review 2021-2022

Last winter, PSE periodically experienced a tight power supply margins as the risks described in the "Winter Forecast 2021/2022" report materialized, in particular high levels of non-usable capacity due to limited coal levels at power plants. The most stressful period was the beginning of December 2021, when import level was crucial to maintain operational reserves at the required level. On December 5, PSE requested to perform the regional part of the Short-Term Adequacy Process (STA), one of the Regional Security Coordinator (RSC) services. For the first time, the Regional Adequacy Assessment (RAA) was performed during the STA process and remedial actions were sought in a coordinated manner for the 6 December (Monday) workday. All required TSOs participated in the coordination and assessed the available capacity levels in their systems that could be used as emergency deliveries to cover the inadequacy in Poland. The conclusions from this process were communicated to the Polish dispatching centre and finally the dispatchers obtained the necessary power levels to maintain operational reserves at required level.

During the storm Eunice, on 16-19 February 2022, there were outages of 400 / 220 kV and mainly 110kV lines. Many towers were damaged and lines disconnected (e.g. planned disconnection of international 400 kV Dobrzen – Albrechtice was prolonged due to damaged towers) for a number of days. The maximum consumption reduction amounted to c.a. 1500 MW / c.a. 37GWh of energy not supplied.

In addition, on 19 February, as the result of mentioned above disconnection of the lines, synchronous area of Poland was divided into 2 parts, both were working synchronous with Continental Europe synchronous area. After Tripping of Krajnik-Plewiska 400 kV line, area in the Szczecin agglomeration was disconnected from rest of PSE transmission system (400 / 220 kV). Nevertheless, the area was still connected through distribution network and through one circuit of the 400 kV line Krajnik-Vierraden with 50HzT, one of the German TSO. This means that the area was not separated from synchronous system but was separated from Polish synchronous area.

Portugal

Summer Outlook 2022

No adequacy issues are expected for the summer 2022. However it should be noted that the net generating capacity may be effectively lower than the indicated on this report as, at the moment, in the beginning of June, we know that there is a delay on the full commissioning of the hydro plants of Gouvães (880 MW) and Daivões (114 MW).

We also know now that a LARES CCGT unit (413 MW) has suffered a major outage and is not expected to be available until 2023.

Winter Review 2021-2022

No adequacy issues were recorded during the past season, despite the poor performance from hydro and wind power generation, as the weather conditions during the season were mild. In November 2021 was decommissioned the last coal power plant in the Portuguese system, so generation from CCGT had a large increase. However this capacity was never needed at full as, due to the natural gas high prices, resorting to interconnection offered a better solution.

Romania

Summer Outlook 2022

No adequacy issues are expected for the summer 2022.

Winter Review 2021-2022

No adequacy issues were recorded during the past season.

Serbia

Summer Outlook 2022

No adequacy issues are expected for the summer 2022.

Winter Review 2021-2022

No adequacy issues were recorded during the past season.

Slovakia

Summer Outlook 2022

No adequacy issues are expected for the summer 2022.

Winter Review 2021-2022

No adequacy issues were recorded during the past season.

Slovenia

Summer Outlook 2022

No adequacy issues are expected for the upcoming summer.

Winter Review 2021-2022

The last winter passed without any adequacy issues or downward regulation. The winter was mild, without long periods of extremely low temperatures and without plenty of snow precipitation. Generation and import capacities were sufficient to cover all energy needs of Slovenia. Demand and its peaks are returning towards the levels before the Covid-19.

Spain

Summer Outlook 2022

No adequacy issues are expected for the upcoming summer.

Winter Review 2021-2022

The capacity margins were tight in the beginning of the period (end of November and first days of December), due to the simultaneous unavailability (both planned and forced outages) of thermal units, lack of wind generation and low hydro reserves.

No adequacy issues took place, despite the low supply margins.

Besides that, the availability of gas supply was closely followed during the winter period, due to the international situation with gas supply and distribution, and taking into account the relevance of the gas availability for the electricity supply in Spain, mainly under low RES conditions.

Sweden

Summer Outlook 2022

East-west flows through the Swedish grid are expected to cause transfer capacity restrictions which will effect possible export and import flows during the summer. Also planned outages for investments and maintenance will impact the capacities. The last two summers Svenska kraftnät took measures to secure voltage and frequency control during the summer period. This summer, however, the situation looks better and the assessment is that no such measures are necessary.

The risk of contingencies resulting in frequency instability is generally higher during the summer when less synchronous power plants are in operation. The Nordic TSOs are procuring fast frequency reserves on a regular basis in order to handle situations with possible low inertia. Situations with a large surplus of generation – as a result of an increase of renewable energy sources – can cause issues with high frequency due to limited possibilities to down-regulate production. However, the high share of hydropower is expected to be able to handle the power balance even in these situations

Situations with high voltages is generally more frequent during the summer when the consumption drops during nights and weekends. Voltage control is increasingly important during the summer months to assure that the voltage is within limits and also to coordinate and include an increased voltage control with planned outages for investments and maintenance.

Lastly, possible heat waves during the summer can affect the power system since capacities are dependent on ambient temperatures. The capacity in the transmission grid will therefore vary during the summer with respect to the weather and expected load flow conditions. Heat waves also increase the risk for forest fires that might force the TSO to take lines out of operation.

Winter Review 2021-2022

The winter was generally normal for Sweden, but December and early January saw low temperatures. The maximum demand during the winter, which also was of normal magnitude, occurred 7 December. However, electricity prices were unusually high during the winter, which indicates scarcity. Furthermore, the strategic reserve was activated for some hours on 6 December. This after a request from the Polish TSO to support Poland with 300 MW of power. For Swedish adequacy, the strategic reserve was not activated during the winter period but was put on standby a couple of times.

Switzerland

Summer Outlook 2022

No adequacy issues are expected for the forthcoming summer.

Winter Review 2021-2022

The winter 2021/2022 was mild in the whole country, in some regions very sunny and very dry in Southern Switzerland.

In Switzerland, the grid and system operation was quite smooth. The voltage profile was mostly comprised within the defined boundaries, but occasionally large quantities of reactive power reserves were required. Switzerland imported almost all the time during the winter. The imports from France and from the North provoked the typical high loading of the 380/220 kV transformers, especially in North-Western Switzerland. The congestion in Germany led to international redispatch measures. Equipment disturbances due to winterly weather phenomena like storms, snow and ice were relatively rare. Provisional grid configurations - which lowered the operational flexibility - were necessary because of foreseen upgrading and maintenance works in substations. The 380 kV Pradella substation, located near the Austro-Swiss border, was put into operation again. No adequacy problems occurred in Switzerland during that period.

Turkey

Summer Outlook 2022

No adequacy issues are expected for the summer 2022.

Winter Review 2021-2022

No adequacy issues were recorded during the past season.