

A background network diagram consisting of numerous white and light blue circles of varying sizes connected by thin white lines, creating a complex web-like structure. The background is a solid teal color.

Winter Outlook 2021-2022

Summer Review 2021

country comments

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

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 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

Winter Outlook 2021 – 2022

No adequacy issues are expected in for the winter 2021-2022.

Summer Review 2021

No adequacy issues were recorded during the past season.

Austria

Winter Outlook 2021 – 2022

Leaving implementations of lock downs as strict COVID-19 measures in this winter period aside, APG assumes that the current electricity consumption, which is above the average for 2017-2019, will remain in the same range. In the event of a lockdown, a reduction of electricity consumption is to be expected.

Overall, this decrease of demand would improve the adequacy situation for Austria.

Summer Review 2021

This summer period was comparably warm – meteorologists monitored the eighth warmest summer in the 255-year history of measurement. Western Austria encountered the wettest summer in the past five years, for the north region of Austria it was the wettest summer within the last ten years. In the south and east, very dry conditions were encountered.

Electricity consumption in summer was slightly above the average for 2017-2019.

Belgium

Winter Outlook 2021 – 2022

The winter in Belgium is characterized by a high nuclear and thermal unit availability and no foreseen outages on cross-border elements. The risk for structural shortage is therefore rather low. Moreover, high electricity prices on the gross market might lower the industrial consumption in Belgium, reducing the expected peak load. The exact impact is hard to predict and is not taken into account in the data collection for Belgium. On the other hand is the load slowly recovering after the Covid pandemic (same level as 2019).

Knowing that the Belgian and French markets are highly coupled, adequacy issues in France can have a spill-over to Belgium. Real-time events (for example loss of a large power plan or big forecasting errors) could also cause stress to remain balanced in Belgium. Vigilance remains therefore required.

Summer Review 2021

Last summer, a full overhaul of the pumped-storage unit of Coe (1 GW Pmax / 6 GWh capacity) between 16/04/2021 and 15/07/2021 has led to limited possibility for market players in Belgium to maintain their balance. An impact can be observed on the system imbalance during this period. This lack of this balancing capacity could also have contributed to the very high imbalance price spike of 3199€/MWh on 21/04/2021 after the trip of nuclear unit Tihange 2.

The unavailability of pumping capacity has led during one weekend to the need of additional measures (nuclear modulation) in order to cope with high renewable in combination with low load.

Bosnia and Herzegovina

Winter Outlook 2021 – 2022

Regarding power system adequacy in Bosnia and Herzegovina for the winter 2021-2022, no particular problems are expected. It is predicted that in the next winter period our consumption would stay at approximately the same level as last year, and the positive power balance is expected.

Summer Review 2021

During the summer period of 2021, there were not unexpected situations that affected the power system in Bosnia and Herzegovina. The minimum load of 685 MW was registered on June 24 at 4:00, while maximum load was registered on August 16 at 15:00, and it was 1592 MW. Monthly power balances were positive during this period.

Bulgaria

Winter Outlook 2021 – 2022

The upcoming winter, if not mild, may prove to be challenging for BG concerning adequacy because of the delayed and prolonged maintenance of hydro generators. Three of the four generators of the extremely important in regards to balancing needs PSHPP Chaira are out of operation and are not expected to come online by the end of 2021 at the earliest. In addition to that, PSHPP Belmeken, HPP Sestrimo and HPP Momina Klisura are all suffering from the same problematic maintenance and further reduce the available capacity from hydro.

Summer Review 2021

The consumption during summer 2021 (June, July and August) is up 8% compared to the same period last year. Bulgaria was struck by a continuous heat wave lasting from 27th July to 5th August when the average maximum temperatures for the country were above 35 °C. This of course led to a new record summer peak load of 5226 MW, registered on Monday, August 2nd 2021 at 14:00 EEST. Despite the hot and dry summer of 2021 no adequacy incidents were accounted in Bulgaria.

Croatia

Winter Outlook 2021 – 2022

Although low air temperatures and lack of precipitation can be challenging to a certain extent for the power system, Croatian TSO (HOPS) does not expect any adequacy issue during the Winter 2021/2022.

Summer Review 2021

Compared with the summer 2020 the demand of Croatian power system was quite higher. Total monthly demand in June 2021 was 1431 GWh (13.6 % higher than in June 2020), in July 2021 was 1657 GWh (10.9 % higher than in July 2020), in August 2021 was 1609 GWh (5.1 % higher than in August 2020) and in September 2021 was 1406 GWh (5.2 % higher than in September 2020). Due to unfavourable weather conditions the electricity generation in hydro and wind power plants was reduced and approximately 40 % of demand had to be covered by imports. Maximum hourly demand (3069 MWh) occurred on 16th August 2021 at 2 pm.

There was no significant interruption of supply nor other adequacy issue.

Cyprus

Winter Outlook 2021 – 2022

There is a delay in the Capacity evolution concerning Cyprus. Commissioning of 990MW Gas and decommissioning of 830MW Oil will not take place as expected in 1st of January 2022.

Summer Review 2021

No adequacy issues were recorded during the past season.

Czech Republic

Winter Outlook 2021 – 2022

No adequacy issues are expected in for the winter 2021-2022.

Summer Review 2021

No adequacy issues were recorded during the past season.

Denmark

Winter Outlook 2021 – 2022

Potential critical periods and foreseen countermeasures

Energinet expects a stable winter. The power situation seems fine and expected power plant outages are at a minimum. There are only a few restrictions on the connections to Germany (TenneT), Sweden and Norway.

The power situation is expected to be stable even in situations with low wind- and solar production. Due to the need of district heating, central and decentralized units will also produce power.

Most critical periods for downward regulation and countermeasures

Energinet does not expect any problems with downward regulation. There will be a large amount of downward regulation especially in times of high wind production.

In periods with high wind production, Energinet expects countertrade on the Danish-German border (TTG-ENDK). The amount of countertrade will be downregulated in DK1 and DK2.

N-1 restrictions can occur in periods with high wind- and solar production at the Danish west coast and in the south-eastern part of Denmark. The N-1 restriction will be solved with redispatch.

Summer Review 2021

No significant incidents happened in the Danish power system during summer 2021. Denmark, as all of Europe, has seen increased prices during summer. The relatively dry spring and summer have taken their toll on Nordic hydro stock and have also decreased the wind output below normal for the period. This situation has during summer lowered the level of the power adequacy surplus, but nothing critical impacting the power balance.

Estonia

Winter Outlook 2021 – 2022

No adequacy issues are expected in for the winter 2021-2022.

Summer Review 2021

No adequacy issues were recorded during the past season.

Finland

Winter Outlook 2021 – 2022

Compared to the previous winter, the overall situation has remained relatively unchanged. As in the previous winters, Finland is a deficit area during peak demand hours. The electricity demand is strongly dependent on temperature. The highest risk for resource scarcity is from January to February, when highest demand peaks are typically reached due to cold temperatures.

The highest expected seasonal demand is approximately 15 GW. Compared to last year the expectation remains the same. Closing of Veitsiluoto mill in last quarter of 2021 decreases demand. However, other industrial activities are assumed to increase the demand. This development is indicated to some extent by 5% increase in electricity consumption in September this year compared to last year.

The net generation capacity is approximately 16.7 GW. Compared to last year the total net generation capacity has increased mainly as a result of commissioning of new wind power. However, around 100 MW CHP capacity has been decommissioned. As a result, the available generation capacity depends slightly more on the climatic conditions. The Winter Outlook analysis considers these climatic conditions affecting renewables generation. Available generation capacity, when assuming low wind generation, is around 11 GW, which is significantly lower than the highest expected demand. In addition, Finland has an out-of-market strategic reserve of 611 MW, that can be used in scarcity situations.

Import is needed to cover the demand during peak hours. Import capacity on interconnections, 5.1 GW, is sufficient to meet the deficit. Finland is highly dependent on the availability of imports especially during periods of low wind generation and high demand. The required amount of import is expected to be available from neighbouring areas also during these periods. It should be noted that there are uncertainties with Russian import due to the impact of capacity payments on the Russian electricity market. There is also a risk of scarcity in the event of a major power plant or interconnection unplanned outage coinciding with the high demand during cold weather.

Summer Review 2021

There were no adequacy problems in the Finnish power system during summer 2021. Several overhauls of both production units and transmission lines were carried out in the summer according to planned schedule. Also, the Nordic hydro reservoirs were at a relatively low level during the summer due to dry weather conditions. These planned outages and hydrological situation, however, had no critical impact on system operation.

France

Winter Outlook 2021 – 2022

The health crisis that is still impacting France and the world for nearly two years has a deep effect on the electricity system.

Although the French electricity consumption has increased in 2021 (compared with 2020), it is still slightly below the pre-crisis levels (up to -2% depending on the week), reflecting in particular the economic impacts for some sectors.

The schedule of nuclear planned outages for this winter, which was already identified by RTE in its previous adequacy reports since 2017 as particularly dense, has become even more so due to the health crisis. This crisis disrupted the schedule for maintenance work at the very heart of the first lockdown, having impacts on the two following years at least. Although it returned to historical levels during summer, the forecast availability of nuclear reactors for the next winter appears to be very low and close to (or slightly below) last winter's levels, and therefore significantly lower than the levels observed before the health crisis.

In March 2021, RTE has already published an adequacy report¹ which included a preliminary analysis for this winter, placed under particular vigilance, like the whole period 2020-2023. The analysis remains consistent with this publication, with an increased level of risk however, mainly due to the combined effects of the incident affecting one of the interconnectors between France and Great Britain and the increased number of nuclear outages (despite some positive rearrangements of the schedule decided by the operator).

The winter 2021-2022 is thus marked by a higher probability of use for "post-market mechanisms" (interruption of major industrial consumers paid for such situations, reduction of the grid voltage, eco-gestures... and as a last resort, brief and targeted power cuts) than the standard.

However, no security of supply issues are expected if the weather conditions (temperature and wind) remain normal for the season. The risks of adequacy issues remain relatively low in November and December 2021. However, they are higher in January and February, since a cold wave is most likely to occur at the heart of winter, and this is the period that would be the most affected by possible extensions of nuclear outages.

RTE has however decided to implement a new dynamic communication system to report on adequacy. In addition to the national winter adequacy report published in mid-November, which provides the global perspective on the whole winter, with an in-depth look at the beginning of the period (November-December), RTE will update the analysis through two new publications at the end of December 2021 and during January 2022. These two publications will include the latest available information on the nuclear unavailabilities, on the weather forecasts and on the energy situation in Europe. These reports will be the reference assessment for the months of January and February.

As a consequence, for France, the result of this ENTSO-E Winter Outlook report has to be treated cautiously and read jointly with the French national seasonal adequacy studies².

¹ <https://assets.rte-france.com/prod/public/2021-04/Bilan%20previsionnel%202021.pdf>

² <https://www.rte-france.com/analyses-tendances-et-prospectives/les-analyses-saisonnieres#Lesdocuments>

Summer Review 2021

No adequacy issues were recorded during the past season.

Germany

Winter Outlook 2021 – 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;
- Grid reserve: Used to resolve congestions and contains different types of power plants located in Germany. Currently, it comprises a total capacity of 5.6 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 German TSO. Currently, about 1.5 GW of interruptible demand is available (prequalified amount of power).
- 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 have to 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 their usage is only possible for problems in Germany. Only in crisis situations, the capacity reserve could also be used to support neighbours.

Extensive conventional power plant unavailability abroad can also affect Germany.

In situations of high RES feed-in in the north and high demand in the south of Germany, the necessity of remedial actions to maintain (n-1)-security on internal lines and on interconnectors is expected.

Summer Review 2021

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 incorporated into the redispatch process. Due to delays, the final target date for the full process implementation has been changed to 1 June 2022.

Great Britain

Winter Outlook 2021 – 2022

No adequacy issues are expected in for the winter 2021-2022.

Summer Review 2021

No adequacy issues were recorded during the past season.

Greece

Winter Outlook 2021 – 2022

For the upcoming winter there is no scheduled maintenance of generation units.

Water reservoir levels are lower than previous years due to the usage of hydro power during heating waves in summer and the drought – absence of rain that followed during autumn.

The gas supply is very crucial for the adequacy of the Greek System for the upcoming winter.

The total import capacity remains the same as in winter 2020 while there is no scheduled maintenance or capacity limitations on any interconnection lines for the upcoming winter.

The impact of COVID-19 (restriction or lock downs) on consumption during the upcoming winter is expected to be minimal while an increase in demand is expected in comparison with winter 2020.

The expected generation and import capacity are sufficient to cover all Greek energy needs and we do not expect any adequacy issues. However Greek system will be highly depended on import transfers during high demand periods in order not to face any adequacy issues in high demand peaks.

Summer Review 2021

In context, during last summer, a significant increase in electricity demand was observed due to environmental conditions (high temperatures) and meta-COVID-19 effect (no restrictions or lock downs). Compared to summer 2020 there was approximately + 11% in average load during all summer. Especially in July the average load increased more than 12% in comparison with July 2020.

In the period under review, there were two heating waves; one in June with no significant impacts on the electricity system or on adequacy and one during the first week of August. The last was combined with extended fires in all Greek territory and especially fires from 2 to 6 August in the northern area of Athens/Attica prefecture. It had impact on the local electricity system and caused outage of lines under which the fire was occurred. On 6 August, three 400 kV lines were lost. However, overloading of other lines was avoided.

Hungary

Winter Outlook 2021 – 2022

Considering the increasing tendency of the system load and energy consumption, among extreme weather conditions there is a possibility for a new peak load record. On the other hand the Hungarian power system is expected to be safe during this winter period. The level of maintenance is low and carefully distributed in time which is an important factor beside the almost constantly required import in order to guarantee the system adequacy. Due to the carefully planning and the responsible behaviour of market players we expect that the needed amount of reserve capacity will be provided.

The increasing PV generation in the Hungarian system cause higher uncertainty in operational planning periods and real time system operation as well, which causes a higher level of reserve requirement.

We do not expect that the COVID-19 would influence the load level of the Hungarian system during this winter.

Summer Review 2021

General comments on 2021 summer conditions

Compared to the previous year the average level of system load and the monthly consumption was higher during the summer due to the fact that there were no restrictions which could influence them. In order to get a clear picture about tendencies we compared the data of 2021 to the historical data of 2019. The load level of the Hungarian system increased and exceeded the expected level in July, because the average temperature was higher than usually in this month. The system adequacy was guaranteed during the whole period. The highest system peak load of summer was recorded on June 24th with 6490 MW.

There were no significant generation outages, they were between 30 and 552 MW.

Hungary usually imports electricity between 2 and 3 GW at daily peak demand. The major part of this import is necessary to guarantee system adequacy. We had no major issues concerning cross-border exchange during the summer time.

Specific events and unexpected situations that occurred during the last summer

There was no any critical event last summer

Ireland

Winter Outlook 2021 – 2022

There is an expectation that the system will enter the Alert State at times over the winter period, most likely at periods of low wind and low interconnector imports. There is an elevated risk compared to previous winters of the system entering the Emergency State. Since the data-freeze there has been a further deterioration in the outlook due to extended forced outages and the re-scheduling of the East-West Interconnector outage, postponed in 2021, starting on 14 March.

Summer Review 2021

Generation margins remained tight in Ireland throughout the summer period. This was mainly driven by long-term forced outages of two large CCGT generation units totaling 844 MW, the poor reliability of some older units on the system and lower than average wind generation levels (wind generation was down 24% in the period between 1 May and 30 August 2021 compared to the same period in 2020).

The Ireland power system entered the Alert state due to tight generation margins on three occasions during the summer period:

- 17 May 2021 from 10:15 to 15:25
- 6 September 2021 from 09:10 to 22:00
- 9 September 2021 from 09:08 to 21:10

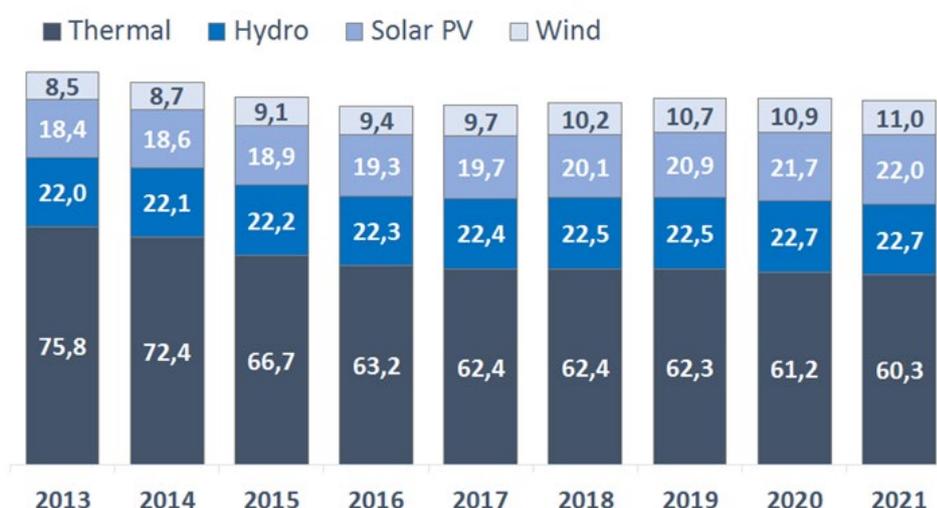
Steps taken by the System Operator to reduce risk associated with tight generation margins during the summer period include:

- Re-scheduling multiple generator outages within the summer period;
- Postponement of a 7-week East-West Interconnector outage to 2022; and
- Countertrading and NTC reduction on the East-West Interconnector.

Winter Outlook 2021 – 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 15GW of thermoelectric power plants have already been phased out. Since 2016 the decommissioning of conventional capacity has proceeded with a reduced pace. The total amount of installed conventional power is now around 60,3 GW and additional 2,4 GW conventional power capacity is not available due to environmental/legal constraints and mothballing.



Until 2020 “Statistical Data” on electricity in Italy prepared annually by Terna are used. For 2021 onward provisional data are

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) selected in capacity market auctions.

Grid reinforcements, developed by the Italian TSO in these last years, also helped to smooth out some effects caused by the power plants decommissioning (especially in the main islands).

Upward adequacy assessment

Import from neighbouring countries is necessary to restore adequacy margins. Critical situations could happen in case of low import or even export to neighbouring countries, or if unplanned outages rate of generation units is higher than the typical values or in case of low hydro power production. Nevertheless, postponement and/or cancellation of maintenances could be used as countermeasures.

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 last week of December and the first week of January, characterized by many public holidays. In order to cope with this risk, the Italian TSO (Terna) prepared preliminary action 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 application of allocation constraints to transmission capacity, could be planned in cooperation with neighbouring TSOs..

Summer Review 2021

Last summer was characterized by a significant increase in electricity demand compared to the same period of the previous year (approximately + 5.4%)

The increase in demand was at pre-COVID-19 levels and was also largely determined by an increase in temperatures compared to 2020, especially in June (average temperatures of about +2.14 ° C) and July.

In the period under review there were no particular incidents with significant impacts on the electricity system or on adequacy.

Latvia

Winter Outlook 2021 – 2022

No adequacy issues are expected in for the winter 2021-2022.

Summer Review 2021

No adequacy issues were recorded during the past season.

Lithuania

Winter Outlook 2021 – 2022

Residual impact of COVID-19 on consumption during winter 2021/2022 should be minimal. As consumption has been gradually recovering during the summer period 2021 was 7% higher than in summer period 2020.

Total import capacity to Lithuanian Power system remains at the similar level as it was during the previous winter period. No significant capacity limitations or outages of HVDC interconnections are planned for the upcoming winter.

No other challenges or special circumstances expected for coming winter.

Summer Review 2021

In summer 2021, national consumption was 6% higher than in summer 2020. Maximum demand (1656 MW) was reached on 22th of September 2021, while the minimum demand (803 MW) was on 6th of June.

In general, the summer balance portfolio consisted of 36% local generation and 64% imports from neighbouring countries. Similarly, to summer of 2020 Lithuania imported 3,6GWh and exported 0,8GWh. Lithuania's largest part of imported electricity was from Latvia (48%) and Sweden (24%) while 74% of exports were to Poland.

Regarding the capacity of Lithuanian power system interconnections, most of the differences from yearly plans were related to HVDC links. Yearly maintenance of LitPol link HVDC interconnection lasted longer than it was planned in the previous Summer Outlook, therefore during the beginning of summer period (week 21) capacity of LitPol link was still reduced to zero. On 27th of July and between 23rd and 27th of August LitPol link HVDC interconnection capacity was not accessible to the market due to energization tests of new equipment in 400kV Alytus substation. On 21st of August capacity of both LitPol link and NordBalt interconnections in direction to Lithuanian power system was reduced to 310 MW due to lack of available frequency restoration reserve. Moreover, there were additional NordBalt capacity limitations from Swedish TSO during weeks 22-24, capacity was reduced by 50% in direction to Lithuania.

No adequacy issues happened during summer 2021. Import contributed significantly to adequacy in Lithuania, however local generation continues to increase.

Luxembourg

Winter Outlook 2021 – 2022

No adequacy issues are expected in for the winter 2021-2022.

Summer Review 2021

No adequacy issues were recorded during the past season.

Malta

Winter Outlook 2021 – 2022

The need to rely on non-market resources to ensure security of supply in rather isolated Mediterranean systems, such as Malta, is common during periods of high demand. Non-market resources reduce the risk of EENS and LOLE in Malta.

Due to the absence of a wholesale electricity market and the existence of a sole supplier of energy, non-market measures are actually an integral part of the power system. Total strategic reserves generating capacity of 215MW (38% of the thermal capacity in Malta) is available for dispatching by the DSO as required, at any point to meet the local demand.

The Winter Outlook report shows significant LOLP during week 48, due to planned maintenance scheduled on the Malta-Sicily Interconnector on 2nd December 2021 between 07:00 and 19:00. During these hours, Malta will be relying on strategic reserves to supply enough energy.

Forecasted demand by ENTSO-E is higher during the evening peak when compared to the current actual demand as no major changes in demand are expected till week 48.

Such issue was also noticed in week 10 2022, whereas maintenance on the Thermal plants is scheduled. Demand forecasted by ENTSO-E is also higher than predicted demand.

Summer Review 2021

Demand during Summer 2021 increased at an average of 6.9% over 2019 and 7.4% over 2020, reaching peak demand at 565MW during week 31.

Very high demand during Summer 2021 was the result of uncharacteristically high climatic temperatures that were sustained for several weeks. For Summer 2022, unless similar high temperatures occur again, it is not expected that summer peak demand will be as high as that reached during Summer 2021.

Montenegro

Winter Outlook 2021 – 2022

No adequacy issues are expected in for the winter 2021-2022.

Summer Review 2021

No adequacy issues were recorded during the past season.

Netherlands

Winter Outlook 2021 – 2022

No adequacy issues are expected in for the winter 2021-2022.

Summer Review 2021

No adequacy issues were recorded during the past season.

Northern Ireland

Winter Outlook 2021 – 2022

No adequacy issues are expected in for the winter 2021-2022.

Summer Review 2021

Generation margin in Northern Ireland was generally low but secure throughout the summer period, with the outage of large generation units planned sequentially insofar as possible.

In September, the Northern Ireland power system entered the Alert state on two occasions due to tight generation margins caused by forced outages:

- 6 September 2021 from 16:41 to 21:50
- 12 September 2021 from 06:32 to 20:54

Steps taken by the System Operator to reduce risk associated with tight generation margins during the summer period include:

- Countertrading and NTC reduction on the Moyle Interconnector.

North Macedonia

Winter Outlook 2021 – 2022

In the past, during the winter months, the electricity demand was correlated with the variations of the outside temperature. That is why during the 2021 winter, it is expected that the peak demand will be in the second half of December 2021 or the first half of January 2022. This upcoming winter, there are no scheduled maintenances on HVAC interconnections.

The relatively warm summer and dry spring of 2021 had an unfavourable impact on hydro reservoir levels. On the other hand, old lignite-powered thermal power plants are prone to more frequent unplanned outages. Moreover, the lignite quality is getting lower with each passing year, and with the Macedonian decarbonization plans, the investments in new lignite mines were cancelled. All in all, this compromises the adequacy for the following winter period.

This winter, the Macedonian power system will rely on its relatively well-developed transmission network for its adequacy. Although the interconnection capacity might seem sufficient to cover the electricity demand, high prices of gas and electricity and the lack of energy on the regional power exchanges may endanger the national adequacy.

The Government of North Macedonia recognized this situation, and as a response to it, declared a state of Energy Crisis. In this state of Energy Crisis, it is possible to apply different measures and activities to elevate the crisis effects. These measures and activities include, but are not limited to, financial interventions in the power sector for energy purchase and to maintain the liquidity of the state-owned companies and mitigate the consequences for traders and suppliers.

Summer Review 2021

The 2021 summer in North Macedonia was relatively warm, with temperatures above 39°C in July and August. The winter of 2020/2021 had below-average snowfall, and the spring that followed was relatively dry. Consequently, hydro reservoir levels are below average for this period. No significant incidents happened in the Macedonian power system during summer 2021.

Norway

Winter Outlook 2021 – 2022

Even if the reservoir levels still are low in southern Norway by the end of October, we do not expect a very critical situation this winter. With normal or high precipitation, the reservoir levels may still increase for some weeks. On the other hand, we expect high hydro power generation during the winter and reservoir development in the lower band of historical reservoir levels. If there will be a lack of hydro generating capacity it is more likely to occur late in the spring. The new HVDC cable between Norway and UK is put into trial operation this autumn, increasing the import capacity. In addition a lot of new wind power capacity have been phased into the network this year, contributing to reduce the risk for adequacy problems. Anyhow the awareness level has been raised from green to yellow level from week 39 in southern and western Norway, but is now back on green level.

The price-level has been very high this autumn and is also expected to be historical high during the winter. This might lead to decreased consumption and also to decreased peak-demand. Traditionally the power intensive industry has shown price-flexibility. However, due to high prices also for aluminium and ferro-products, the powerprice-flexibility for the industry might be low. For households there will probably be some decreased consumption due to high power-prices. The level of decrease has however not been estimated.

Summer Review 2021

The summer season started with reservoir-levels above average. Due to low precipitation, the reservoir levels have developed below average levels, and are now at record low levels in southern Norway. Power prices have also been high during the summer season, but this is not due to lack of capacity. The production from hydro and power export has been high, due to high power prices in Europe, increased exchange capacities and high fuel and CO2 prices. Little wind, both in Norway and Europe, has also lead to low wind power generation.

Poland

Winter Outlook 2021 – 2022

Despite the lack of adequacy issues identified in Winter Outlook 2021/2022 simulations, there is a risk, that unfavourable conditions, i.e. weather conditions (low RES infeed, high load) and high level of outages may endanger the adequacy. The availability of estimated import level then will be a key issue.

Additional risk comes from the current situation on gas and coal markets in Europe – in case of problems in fuel availability, adequacy level may substantially change.

Summer Review 2021

On Monday, May 17, 2021, shortly after 16:30 CET, a disruption occurred at PSE's Rogowiec substation. As a result of system protection actions, 10 generation units of the Bełchatów power plant, owned by PGE GiEK, were automatically switched off leading to a loss of 3.3 GW of generation.

PSE immediately balanced the system among others by starting up generators at pumped storage power stations, activating spinning reserves at other power stations, and agreed emergency support from TSOs of the Czech Republic, Slovakia, and Germany.

Portugal

Winter Outlook 2021 – 2022

The decommissioning of the last existing coal power plant in the Portuguese electricity system (Pego, 576 MW) on November 30th was the second major change in installed capacity in less than one year, following the decommissioning of Sines (1180 MW, the largest plant in Portugal) in the beginning of 2021. On the opposite direction, we only had an increase of 330 MW on solar capacity, as the commissioning of the new large hydro power plants, initially expected in 2022, was delayed to 2023.

According to the results of this winter outlook, for Portugal, in normal conditions of market functioning, there are no foreseeable issues from the system's adequacy point of view. Nevertheless we think it worth to mention that in the next winter season the Portuguese electricity system will be operated with a net generating capacity that is about 4.5% shorter than last year, so is expected some use of interconnection capacity to supply Portuguese demand.

In case of unavailability of imports from Spain in normal market conditions, some mitigating measures can be used to handle operational reserve needs and ensure security of supply, namely load reduction (load shedding service for eligible industrial consumers until the end of 2021, which will be replaced by a market product for demand reductions in the beginning of next year). Also occasional load shedding of non-priority consumptions can be used if necessary.

Summer Review 2021

As expected, no adequacy issues were found during 2021 summer season and system's operation was performed without trouble, unless the 24th of July incident (disconnection of the Iberian Peninsula from France), that had an impact on Energy Not Supplied, but that wasn't however an adequacy related situation.

During summer season hydro conditions were favourable, in fact hydro generation in august more than doubled the average (it should be noted that, however, this is not much significant as hydro inflows in the summer are very low) which helped to compensate an unexpected bad performance from wind power generation (about 83% of the average value for this month).

Demand was lower than in the previous summer season (less 3.2% in July), essentially due to below the average temperatures. Heat waves were also less prevalent and severe than in recent years.

Romania

Winter Outlook 2021 – 2022

In case of severe weather conditions and considering the increasing tendency of the energy consumption there is a possibility for a new peak load record during this winter period. Also given the high installed generation capacity in wind and solar power plants in the Romanian power system in case of very high unpredicted variations of RES generation, the real time system operation can be challenging.

However, regarding power system adequacy scenarios in Romania, for the winter 2021 - 2022, expected generation availability and import network capacity should be enough to cover all energy needs of Romania. Some adequacy problems might occur in case of regional / European scarce power resources when the energy imports are under uncertainty.

Summer Review 2021

Last summer was characterized by a significant increase in electricity demand compared to the same period of the previous year (approximately + 5.4%).

The minimum load of 4347 MW was registered on June 21 at 06:00 (RO time), while maximum load was registered on July 28 at 14:00 (RO time), and it was 8319 MW.

Serbia

Winter Outlook 2021 – 2022

For the upcoming winter, according to the planned energy balance, we do not expect problems to cover demand. The significant energy imports are expected under normal weather conditions through the December 2021 & January 2022. Under severe weather conditions, i.e. extremely low temperatures, extremely high peak demand might occur. It might lead to a reduction of planned export of energy and increase energy import to cover the demand.

Summer Review 2021

The last summer passed with some problems related to the electricity energy price on the spot markets. That caused problems on the internal market, some participants were suspended or terminate the contact. Weather conditions were in generally with periods of expected temperatures and without longer periods of very high temperatures. The shortage of energy produced from the renewable sources caused additional import.

Slovakia

Winter Outlook 2021 – 2022

No adequacy issues are expected in for the winter 2021-2022.

Summer Review 2021

No adequacy issues were recorded during the past season.

Slovenia

Winter Outlook 2021 – 2022

For the upcoming winter expected generation and import capacities are sufficient to cover all energy needs of Slovenia and consequently we do not expect any adequacy issues.

Scheduled maintenance of generation units is similar to previous years, our two biggest power plants will be in operation for the entire period (NEK-700 MW and TEŠ6-539 MW). During the 26th of March and 1st of April 2022, the only pumping hydro power plant in Slovenia of nominal power 180 MW will be under revision so in case of low load an export of maximum 100 MW will be required.

Summer Review 2021

The last summer passed without any adequacy issues or downward regulation. Summer was moderate, without extremely high temperatures, longer heat waves and with a solid amount of precipitation. Demand and its peaks were ca. 10 % greater than in previous year, but that is mainly due to covid-19 impact on economy in 2020. Our two biggest thermal power units in Šoštanj experienced some individual and relatively short unplanned outages in July and August, however our hydro plants had enough water at their disposal most of the time, which together with our import capacities and other power units was sufficient for covering all our energy needs or potential energy shortages.

Spain

Winter Outlook 2021 – 2022

The generation capacity for the upcoming winter is enough to avoid adequacy issues. However, under very unlikely conditions with simultaneous occurrence (extremely high demand, very low RES and high rate of unexpected outages), the adequacy margin could be tight, mainly during the first half of December.

Hydro reservoirs levels are currently below the historical average values.

Besides that, the main risk for adequacy is related to the gas availability to combined cycle thermal plants. A lack of gas supply is not expected for the upcoming winter, but the eventual risk has been considered and will be closely followed during the winter period due to the international situation with gas supply and distribution.

Summer Review 2021

No adequacy or downward issues took place during summer 2021. The demand in the period was 1% higher than the year before.

A major incident, nonrelated to adequacy, took place on the 24th of July due to the disconnection of the Iberian Peninsula from France. Spain was importing 2.5 GW from France at the moment and the incident led to a frequency increase (60 mHz) with no further consequences in the large North-East area of Continental Europe, and a frequency drop down to 48.65 Hz, triggering the disconnection of 1995 MW hydro pumps and automatic shedding of approximately 3068 MW of load in Spain. The incident started at 16:32 and the reconnection of the Iberian Peninsula took place at 17:10.

Sweden

Winter Outlook 2021 – 2022

In terms of maintaining adequacy in Sweden, the winter period is the most critical. This is due to the correlations between outdoor temperatures and demand, where demand peaks have a strong correlation to the coldest periods. During strained conditions and peak demand, imports via interconnections are expected to play an important role in maintaining adequacy.

To help secure adequacy during peak demand, Svenska kraftnät contracts a strategic reserve. For the coming winter 2021/2022 this strategic reserve capacity is 562 MW and thus unchanged compared to the previous winter.

Summer Review 2021

In terms of maintaining system stability and adequacy, the summer of 2021 in general had better conditions compared to the previous summer. The HVDC interconnector "South-West Link" in the southern region of Sweden was taken into commercial operation on the 27th of July, initially providing a capacity improvement of 800 MW between SE03 and SE04. In addition to this, a thermal plant "Ryaverket" was contracted over the summer to help maintain system stability, in case the need would arise.

Due to issues during maintenance of one of the reactors of the nuclear power plant "Ringhals", the revision period had to be prolonged to the extent where all of the available reactors of "Ringhals" were unable to operate for approximately a month around August. Despite this occurrence, the contracted thermal plant "Ryaverket" did not need to be activated to maintain system stability and was never activated throughout the summer and contract period. In general the summer was favorable without any major issues.

Switzerland

Winter Outlook 2021 – 2022

No adequacy issues are expected for the forthcoming winter.

Summer Review 2021

The summer of 2021 was not one of the hottest, but it was in line with the hot summers of the last three decades.

North of the Alps, the summer of 2021 was one of the rainiest since the beginning of the measurements in 1864. South of the Alps, precipitation was high too.

The sunshine was slightly below the 1981-2010 average.

During the summer of 2021, there were high voltages in the Swiss Mittelland and in Eastern Switzerland, especially during the off-peak hours. Due to the snowmelt - which led to high hydro generation - there were very high loadings of grid elements and congestion in the Alps (cantons Wallis and Tessin). The transit axes in the south were also very strongly loaded. Because of works in canton Graubünden (Engadin), the connection to the Austrian neighbouring network was at times weakened or interrupted. Some Swiss substations were renewed and extended; this led to temporary grid configurations that ensured the security of the grid and the security of supply.

Turkey

Winter Outlook 2021 – 2022

No adequacy issues are expected in for the winter 2021-2022.

Summer Review 2021

No adequacy issues were recorded during the past season

Ukraine

Winter Outlook 2021 – 2022

No adequacy issues are expected in for the winter 2021-2022.

Summer Review 2021

No adequacy issues were recorded during the past season