2020
summer outlook
winter review
2019-2020

entsoe

Table of Contents

Introductory remark

A dedicated pan-European stress test was performed promptly after major updates in planned generation outage were announced in late May, mainly in France. As a result, the Summer Outlook 2020 report publication was postponed for consolidating the adequacy outcomes. The results confirmed that major planned outage updates do not add extra risk in Europe and results based on the pre-pandemic information are representative.

Executive summary

The ENTSO-E Summer Outlook 2020 identifies no major adequacy risk in Europe. The COVID-19 pandemic could ease the adequacy situation even if the level of uncertainty in this respect remains high. [1]

The need to rely on non-market measures to ensure security of supply in rather isolated Mediterranean systems such as Malta is common in summer periods. The Summer Outlook 2020 highlights some risks in this respect, but non-market measures should be sufficient to cope with operational challenges and supply shortages.

In some bidding zones of Italy as well as in Poland, some minor risks are also identified for certain weeks. These will be closely monitored by the Transmission System Operators (TSOs) and Regional Security Coordinators.

The COVID-19 pandemic is expected to ease adequacy in Summer 2020 even if it is difficult to predict the specific impact of the pandemic due to high uncertainty. TSOs expect demand to recover over the summer from the very low levels recorded in spring, but to remain below what typically would be expected in normal years; especially in southern countries where supply margins normally shrink during the summer. Some outages had to be rescheduled, which could influence the resource availability in the coming winter.

Already now, TSOs are cooperating to mitigate any potential risks linked to the all-round rescheduling of outages Additional monitoring will be performed through the Winter Outlook 2020/2021 adequacy assessment, when the rescheduling plans will be more advanced.

The Summer Outlook is accompanied by a retrospect of last winter. On 23 December 2019 Malta experienced a blackout due to ship anchoring causing a failure of the interconnector with Sicily. Supply to all consumers was recovered within three hours when emergency units were dispatched. The interconnector was operational again in March 2020. Until then, demand was automatically shed several times to maintain grid stability after generation failures. As usual during interconnector outage, emergency units were dispatched as spinning reserves to minimise these automatic shedding. No consumers were shed due to lack of generation capacity.

Winter 2019/2020 was the warmest on record in Europe. It was marked by some winter storms towards the end of the season, by coinciding with the start of the COVID 19 pandemic. TSOs experienced challenges in voltage regulation (i.e. keeping the voltage within the operational range) and in dealing with unusual flow patterns when renewable generation was high, and demand was low. They managed by relying on markets to a large extent and only used the curtailment of renewable generation as a last resort. Despite these exceptional circumstances no security of supply incident was recorded.

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[1] The data collection for Summer Outlook 2020 was performed prior to the Covid-19 pandemic. This means that the impact of the Covid-19 measures applied in each country are not captured in the data and the analysis performed. However, having conducted a 'stress test' to assess the recently announced maintenance reschedule under severe conditions (including heat wave and low res generation), TSOs themselves do not expect that the pandemic will negatively impact adequacy during this summer, and consider the adequacy assessment results in this report to remain relevant. TSOs will continue to closely cooperate this summer and adequacy will be monitored closer to real-time through the services of the Regional Security Coordinators (RSCs).

Seasonal Outlook Revolution

For Summer Outlook 2020 report, ENTSO-E significantly upgraded its methodology for assessing adequacy on the seasonal time horizon.

This new methodology is described in the Methodology for Short-term and Seasonal Adequacy Assessments[2]. It was developed by ENTSO-E in line with the Clean energy for all Europeans package and especially the Regulation on Risk Preparedness in the Electricity Sector (EU) 2019/941 and received formal approval from Agency for the Cooperation of Energy Regulators (ACER)[3]. Although, the implementation of this target methodology will still require some extensions in the coming year (for instance to include flow-based modelling), the present Summer Outlook shows a major advancement.

Most notably, the new seasonal adequacy assessment has shifted from a weekly snapshot based on deterministic approach to the well-proven, state-of-the-art sequential hourly Monte Carlo probabilistic approach. In the Monte Carlo approach, a set of possible scenarios for each variable is constructed to assess adequacy risks under various conditions for the analysed timeframe. Figure 1 provides a schematic representation of this scenario construction process.

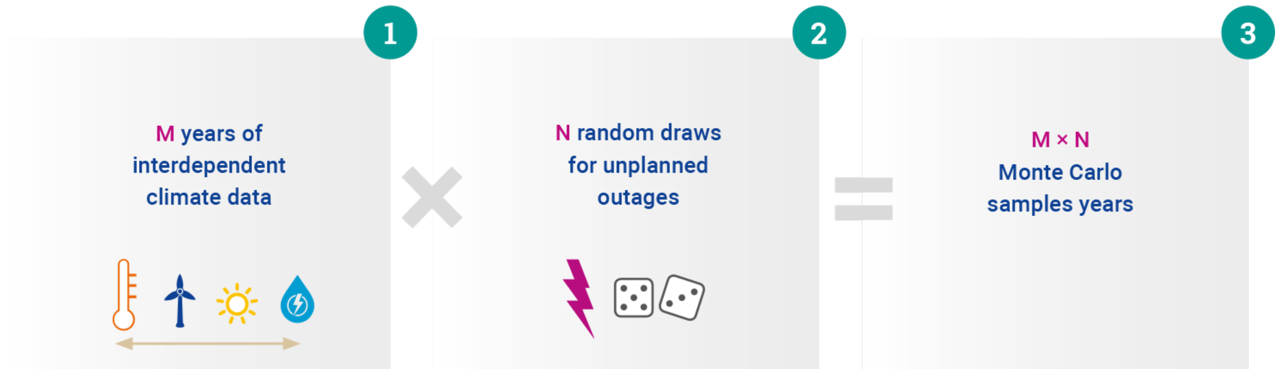


Figure 1 Scenarios assessed in Seasonal Outlooks

Scenarios are constructed ensuring that all variables are correlated (interdependent) in time and space. To ensure the highest quality of data used in assessments, they are prepared by experts working within dedicated teams. A pan-European Climate Data base maintained by ENTSO-E ensures high data quality and consistency across Europe.

As a result, ENTSO-E moved from a 'shallow' scenario tree containing only a severe conditions sample and a normal conditions sample to a 'deep' scenario tree that combines dozens of years of interdependent climate data with random draws of unplanned outages to generate a multitude of alternative scenarios. Furthermore, an improvement in the methodology also enables the consideration of the hydro energy availability. Figure 2 illustrates the difference in the number of scenarios between the two modelling approaches.

[2] *Methodology for Short-term and Seasonal Adequacy assessment*

[3] *ACER decision (No 08/2020) on the methodology for short-term and seasonal adequacy assessments*

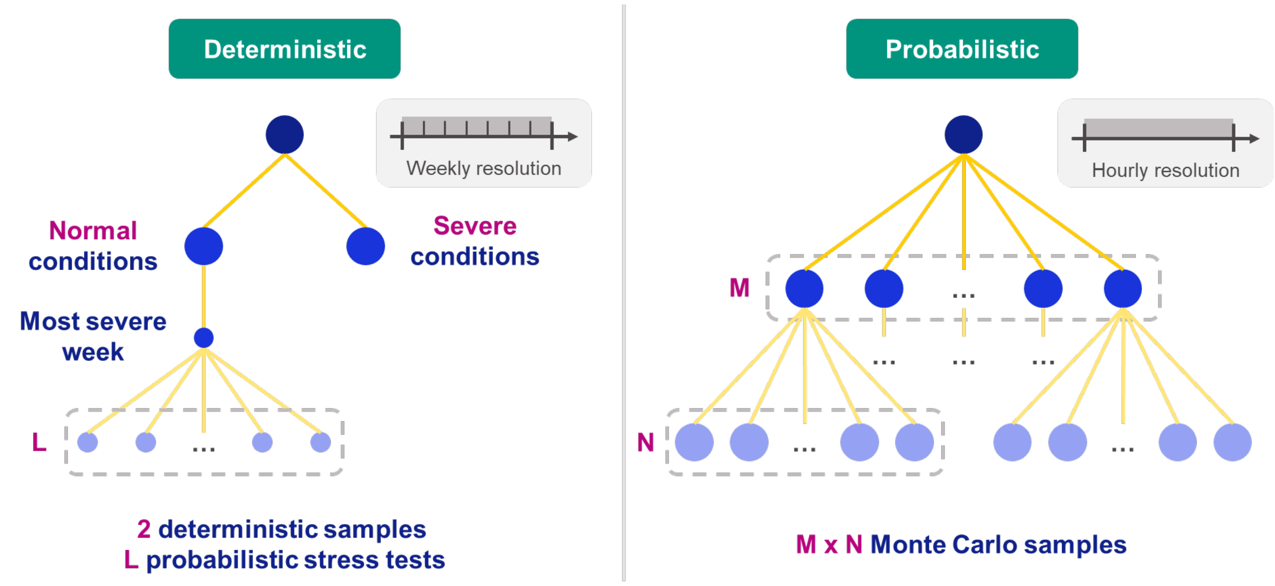


Figure 2 Scenario revolution – from deterministic to probabilistic

For each of the scenarios, an adequacy assessment is performed on the seasonal time horizon, resulting in an overall probabilistic assessment of pan-European resource adequacy that can not only identify whether the adequacy risks exist under various deterministic scenarios, but that is also able to construct a high number of consistent pan-European scenarios and identify realistic adequacy risk.

Overview of power system in Summer 2020

The data collection for Summer Outlook 2020 was performed prior to the Covid-19 pandemic. This means that the impact of the Covid-19 measures applied in each country are not captured in the data and the analysis performed. However, having conducted a ‘stress test’ to assess the recently announced maintenance reschedule under severe conditions (including heat wave and low res generation), TSOs themselves do not expect that the pandemic will negatively impact adequacy during this summer, and consider the adequacy assessment results in this report to remain relevant. TSOs will continue to closely cooperate this summer and adequacy will be monitored closer to real-time through the services of the Regional Security Coordinators (RSCs).

The information about the power system presented in this report considers all resources available to supply demand in a market-based approach. This means that all resources dedicated to ensuring operational security are not represented. This includes generation capacity, which is dedicated for grid stability, transfer capacities which are dedicated to cope with power flow variability and out-of-market measures which are dedicated to cope with power supply shortages. Therefore, the figures presented in the report should not be considered as resources that are physically available in the power system, but rather as resources which are available to supply demand through energy markets.

Generation overview

The generation capacity overview in Figure 3 shows that installed and available on the market capacities cover the highest expected demand in Summer 2020; however, in some places imports might be necessary in the event of low renewable generation. Net Generating Capacities (NGC) are sufficient to cover the highest expected demand in all study zones (except Luxembourg), but if only thermal and hydro units are considered, the NGC in many study zones decreases. In some study zones it even falls below expected highest demand in Summer 2020. This suggests that in the case of low renewable generation, imports might be necessary to ensure security of supply. Furthermore, this ratio falls even further if we consider generation unavailability (e.g. planned and unplanned outages); and further technical constraints (e.g. reductions of NGC due to high cooling water temperatures). Therefore, it is important to assess adequacy on a pan-European scale.

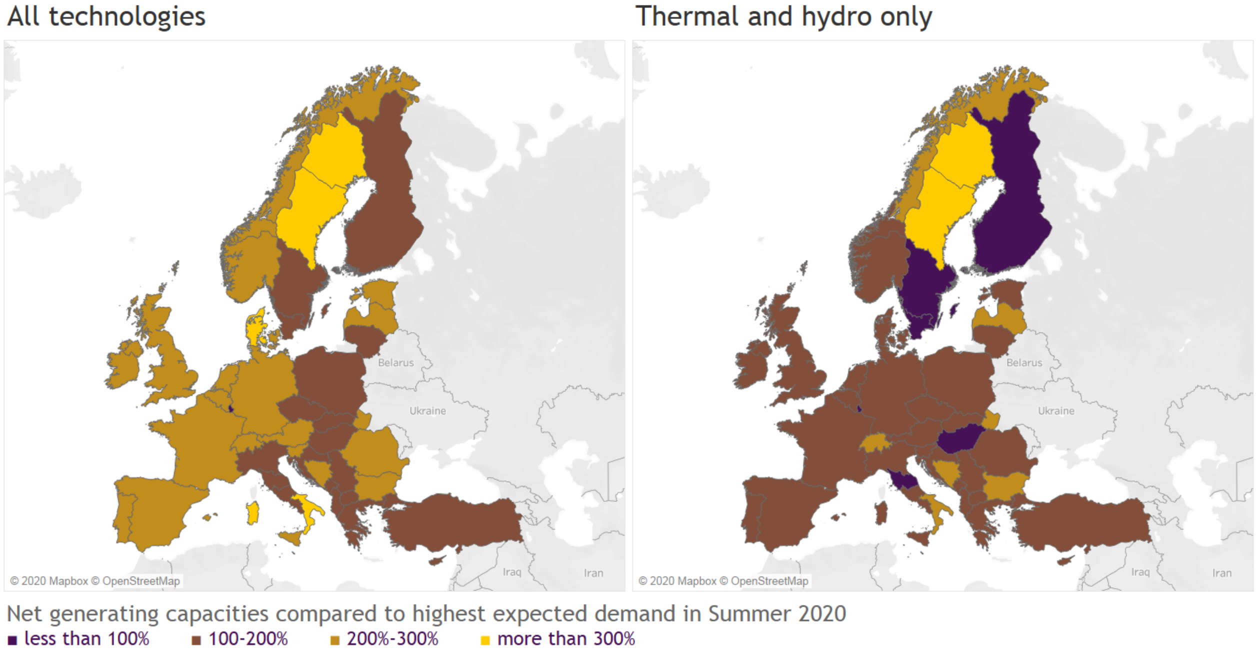


Figure 3 Net generating capacity overview – comparing with highest expected demand

According to Figure 4, thermal NGC, which is available on the market, accounts for approximately 50% of the total capacity of the European power system at the beginning of Summer 2020. This is followed by hydro, wind and solar capacities, which constitute the remaining half.

In most of the study zones, thermal NGC share is below 60%. This is especially noticeable in study zones with high hydro capacities. Nevertheless, in some study zones (e.g. Western Denmark (DKW1), Germany (DE00) and southern Sweden (SE04)) thermal NGC share is low despite insignificant hydro capacities. These systems are distinguished by a high share of wind and solar generation.

> Info box:
> Study zone naming convention
>
> Country code ← <u>XX</u> <u>YY</u>
>
> ENTSO-E zone index ←
>
> Map with codes are available in Appendix 1:

Demand Side Response (DSR) services are gaining popularity in Europe, especially in the Nordic countries. This in turns means a greater participation of electricity consumers in the power system. Nevertheless, DSR is not available all the time and may be available only for a limited period of time (e.g. 2 hours in a day). It is more likely to be available during peak times, but this is not guaranteed.

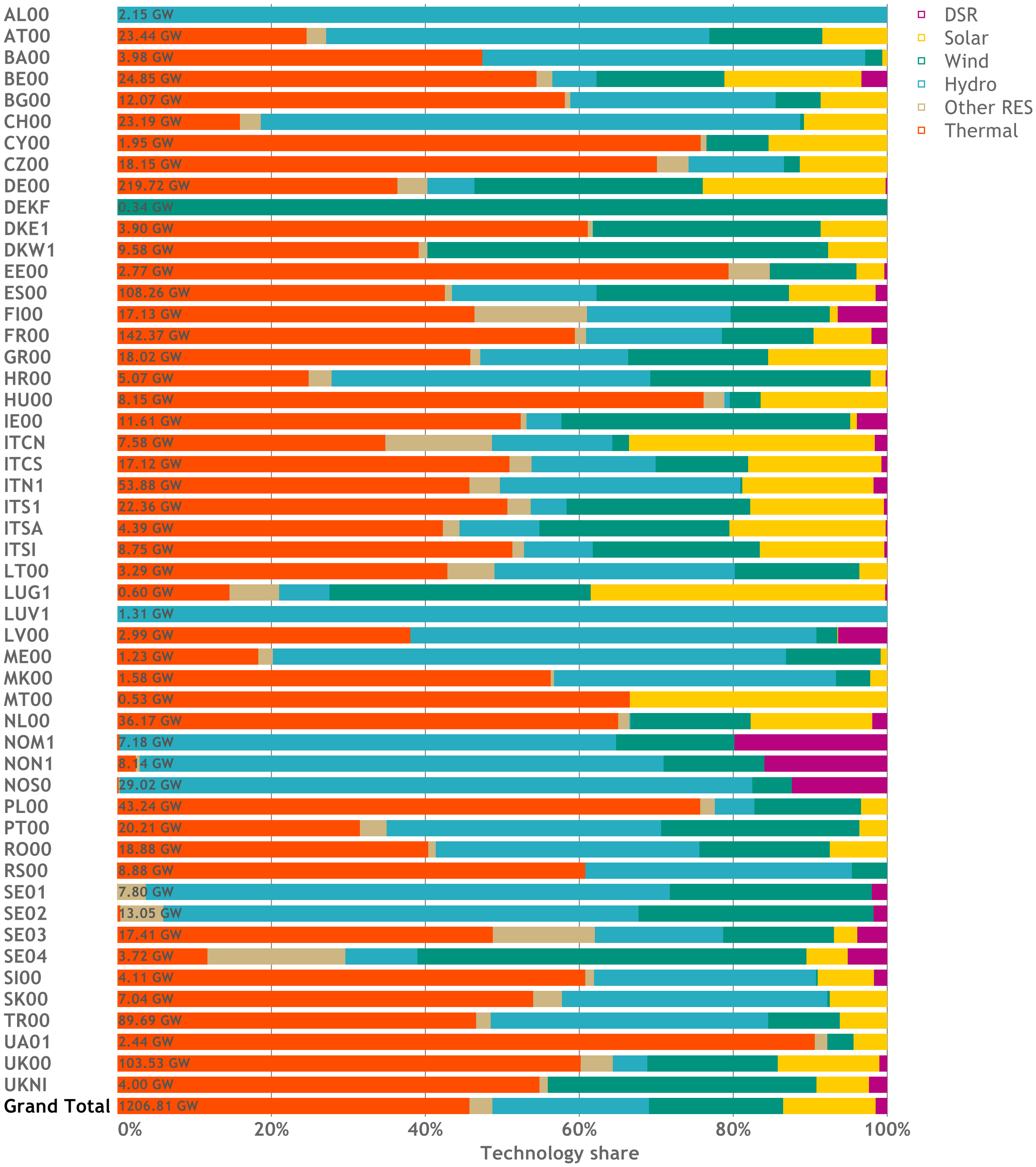


Figure 4 Generation capacity mix at the beginning of summer 2020 per study zones

Capacity evolution

Most relevant capacity evolution in Summer 2020 is shown in Figure 5. Considering all officially announced commissioning and decommissioning events, total thermal capacity in Europe is expected to remain unchanged during Summer 2020. Gas- and hard coal-fuelled units contribute to 1.4 GW of newly commissioned units, whereas lignite-based capacity tends to decrease by 1.4 GW in total.

Commissionigs and Decommissionings

BE00	Hard coal	01/09/2020	Decommissioning 75 MW
CZ00	Hard coal	30/06/2020	Decommissioning 184 MW
	Lignite	30/06/2020	Decommissioning 760 MW
DE00	Hard coal	01/07/2020	Commissioning 1055 MW
GR00	Gas	01/06/2020	Commissioning 310 MW
	Lignite	30/09/2020	Decommissioning 546 MW
ME00	Lignite	01/06/2020	Commissioning 225 MW
PL00	Hard coal	30/06/2020	Decommissioning 223 MW
	Lignite	01/07/2020	Decommissioning 360 MW
RO00	Gas	01/07/2020	Commissioning 400 MW
RS00	Gas	01/10/2020	Commissioning 183 MW

Figure 5 Capacity evolution in Summer 2020

Planned unavailability

Planned unavailability of units considered in the assessment is presented in Figure 6. Planned unavailability of generation includes planned outages to maintain generation units and generation units in mothballing. Total planned unavailability in Europe decreases towards mid-summer.

Nuclear units show the highest level of unavailability among thermal technologies at the beginning of summer 2020. Gas ranks second, followed by hard coal, lignite and oil-fuelled units. Planned unavailability decreases towards mid-summer and then increases again towards the end of summer.

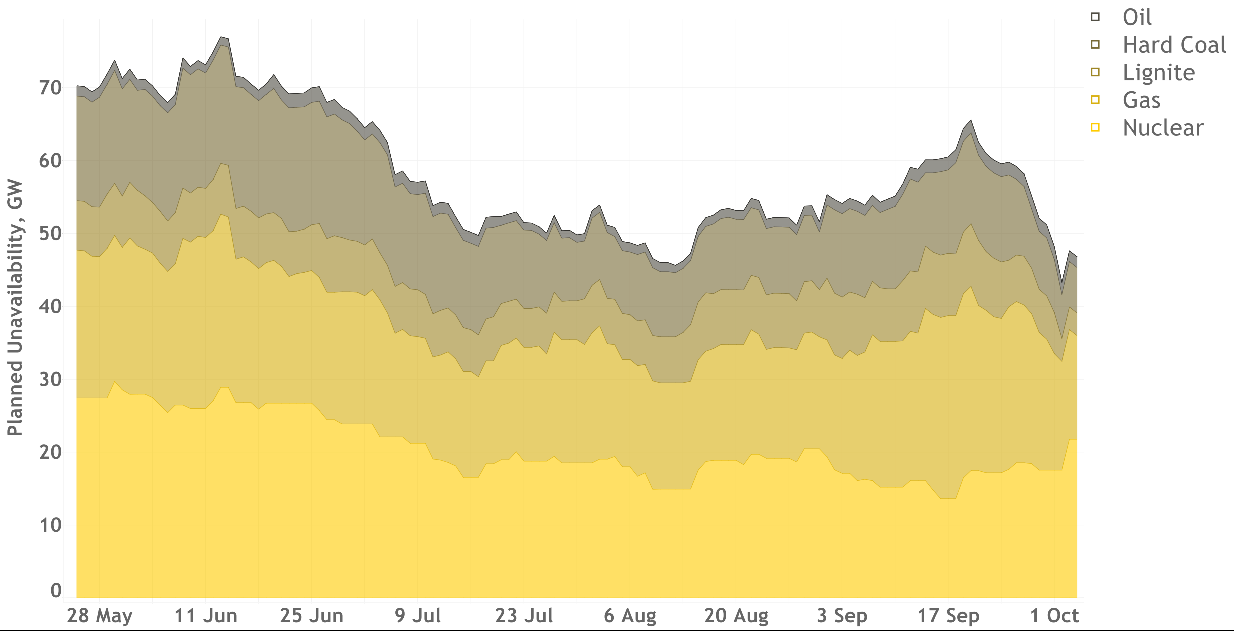


Figure 6 Planned unavailability of thermal units

Planned unavailability in southern countries tend to decrease during the warmest months when highest demand is expected (i.e. in July and August). This can be observed in the cases of southern Italy (ITS1, ITCS) or Greece (GR00) in Figure 7. The figure presents the weekly distribution of thermal planned unavailability within all study zones, by depicting highest ratio of thermal planned unavailability with total NGC in each study zone for all weeks. At the same time, planned unavailability in other countries does not vary throughout the summer or even has an inverse trend (planned unavailability increases towards the mid-summer). Inverse trend can be observed in Ireland (IE00), Denmark (DKE1, DKW1) and some other zones.

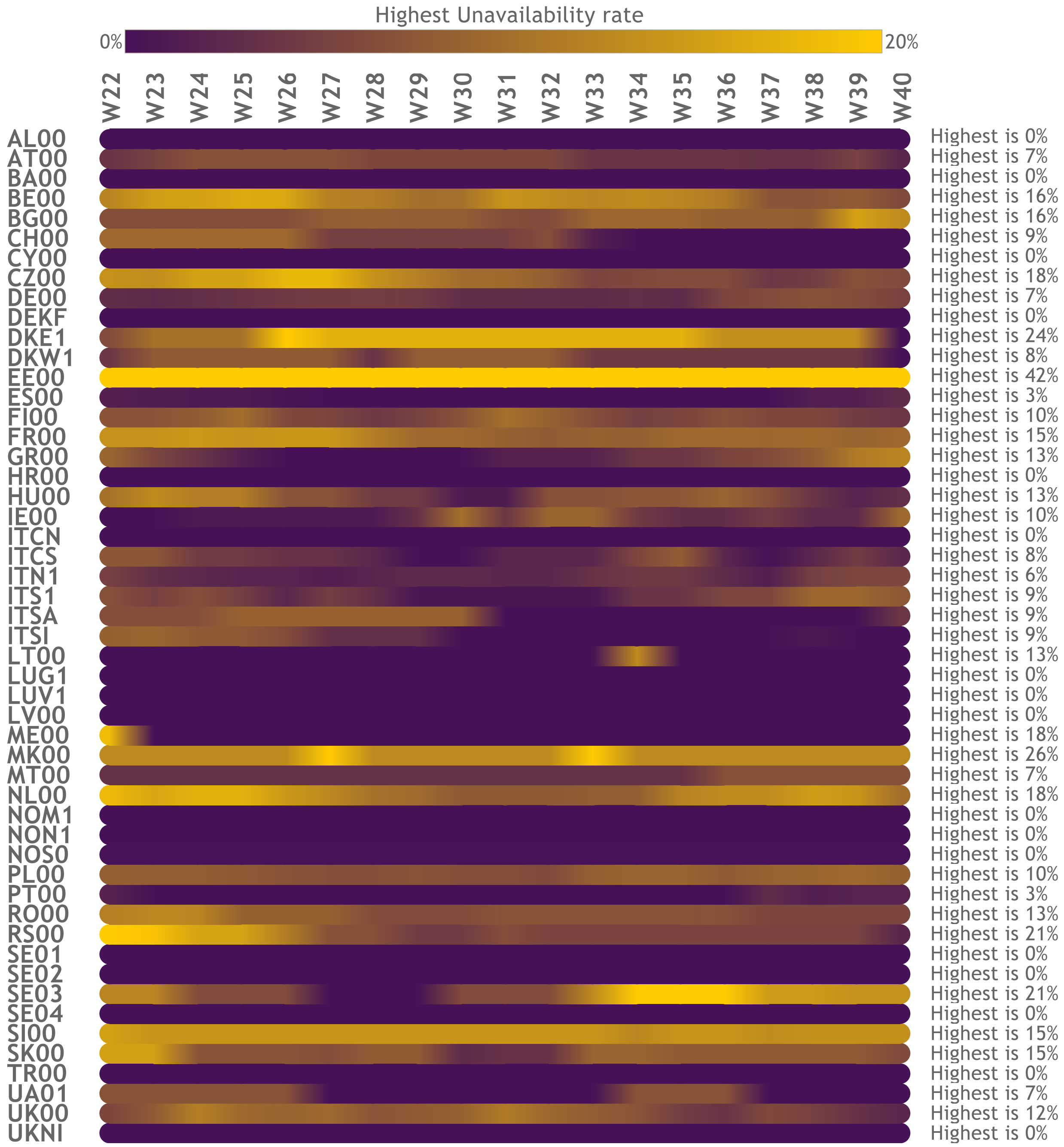


Figure 7 Weekly distribution of thermal planned unavailability relative to total NGC

Demand overview

Southern countries, such as Italy, display increasing demand towards mid-summer, whereas Northern countries, such as Norway, show an opposite trend. Other countries, such as the Netherlands, indicate a small variability during season, as presented in Figure 8.

The demand overview (Figure 8) compares expected consumption in each week with the highest expected weekly consumption in summer 2020. The darker shades indicate low expected consumption as compared to highest expected consumption. This helps to identify some holiday periods (e.g. Belgium and France) or shows demand change within season (e.g. Italy).

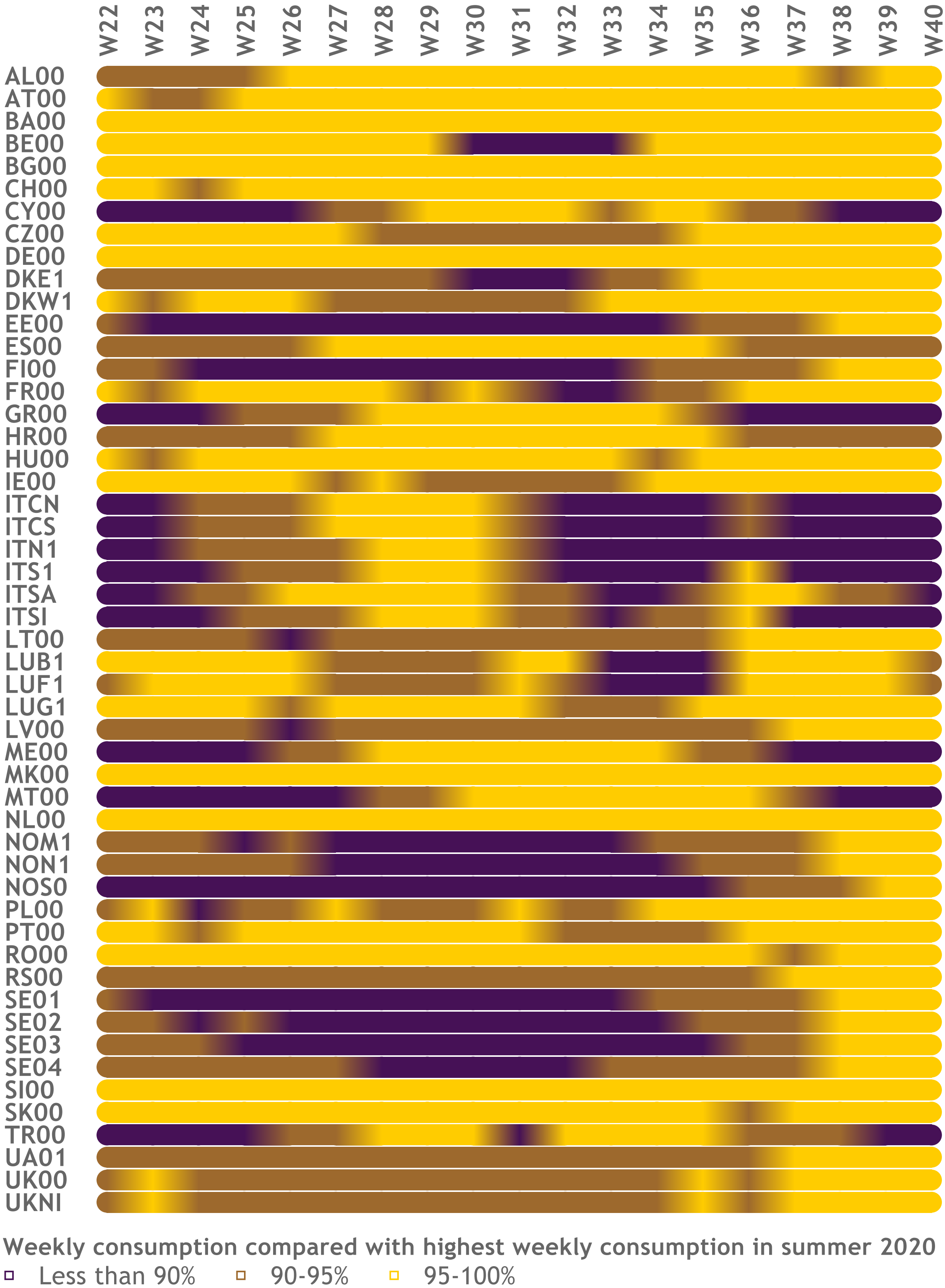


Figure 8 Demand overview - evolution over Summer 2020

Demand peak in Europe is concentrated around noon for most of the study zones. In some study zones (e.g. DKE1, BA00), an evening peak is also observed similar to noon demand peak. In other study zones (e.g. BG00, ITS1, ITSA, ITSI) a demand peak is observed in the evening. This is presented in Figure 9.

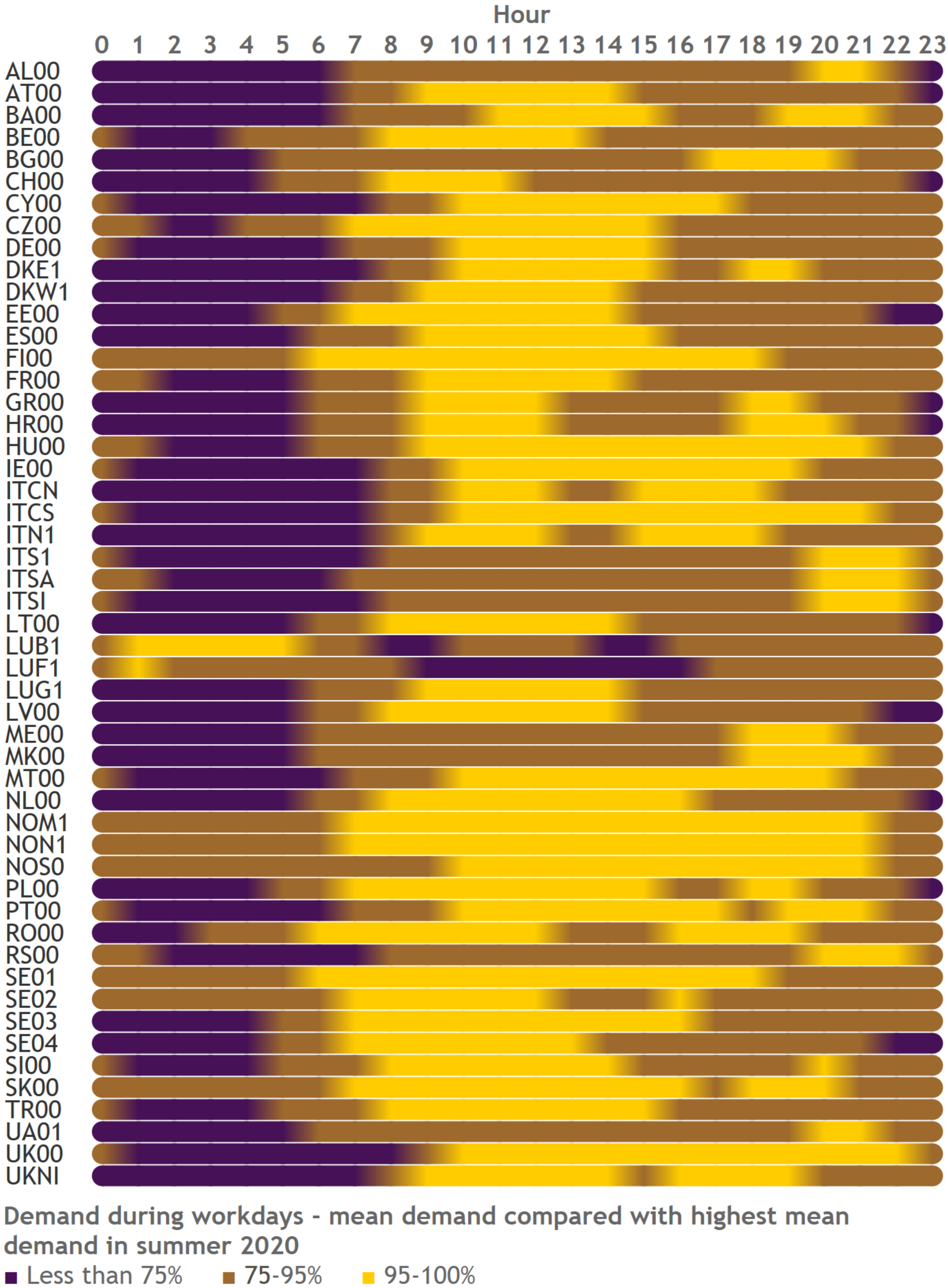


Figure 9 Demand profile overview during Mondays–Fridays in summer 2020[4]

[4] UTC time convention was used.

Network overview

The map in Figure 10 shows the ratio of lowest import capacity in summer 2020 to the highest expected demand during summer 2020. Import capacities considers planned unavailability of grid elements; however, additional unplanned outages may constraint import capacities even further. Furthermore, import capacities with non-modelled systems (not coloured in figure) are not considered. Sweden, Denmark, the Baltic countries and the Balkans, present the highest ratio (above 75%). At the same time, Western Europe indicates a relatively low ratio (below 25%) of available transfer capacities to the highest demand. Therefore, these countries might be highly reliant on locally available resources during demand peaks.

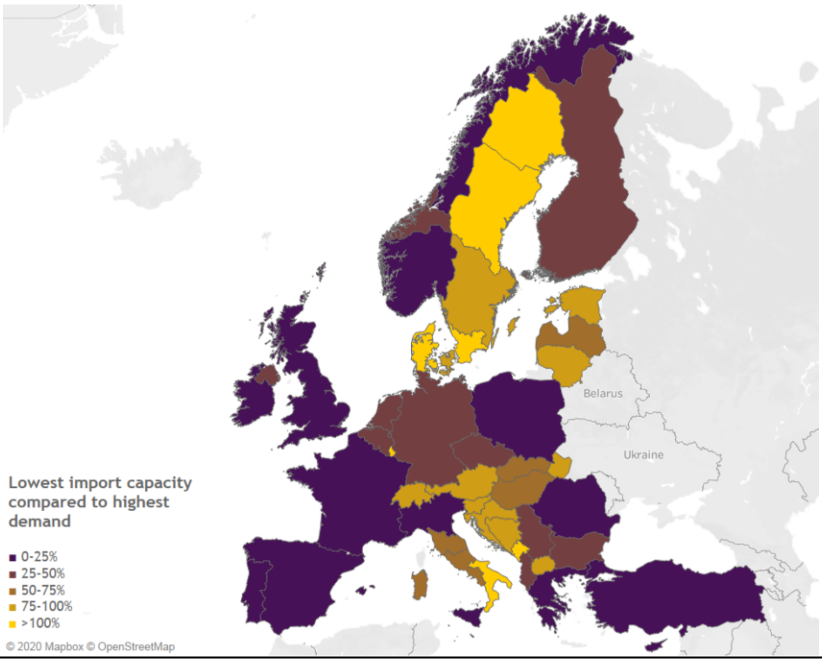


Figure 10 Import capacities per study zone: ratio between import capacity and peak demand. C.f. Figure 19 for details

COVID-19 impact

To evaluate the impact of Covid-19 on the summer adequacy situation, some information was shared among TSOs. No adverse impact due to the COVID-19 pandemic on adequacy is expected in the summer of 2020, but TSOs remain cautious especially when preparing for the coming winter.

Demand

Demand is expected to remain below typical levels during the summer of 2020. Most countries have recorded a demand lower than that which was expected before the beginning of the COVID-19 pandemic. A downward trend was recorded for all periods, including demand peaks. In some countries demand even fell by 25% a time. However, it is very hard to predict what the exact impact will be during the summer. It can be assumed that demand will start to increase with the stepwise revocation of the containment measures and recovery of the economic activities. Nevertheless, the expectation is that for most countries demand will remain below typically expected levels, especially in southern countries and where tourism represents a large share of economic activities. This decrease of demand has a positive effect on adequacy in the summer of 2020.

Generation

Planned outage schedules of supply units in some of the countries are being revised. For example, maintenance is either prolonged due to safety rules and restrictions in work performance, postponed or restricted only to the essentials. Some changes of planned outages in Summer 2020 are expected. Nevertheless, this rescheduling would have the most impact after the summer season. At the drafting the report[5] there are no indications that these changes will have a significant impact on the overall availability of the production units this summer.

Network

No major impact on network availability is expected. Some planned outages of network elements were rescheduled, but TSOs do not expect significant impact on system operations. A higher occurrence of voltage regulation challenges can be expected, but this does not pose any risk that consumers will not be supplied.

Adequacy

There are no indications that the COVID-19 pandemic is burdening the summer adequacy. All TSOs will continue to closely follow the evolution of the Covid-19 pandemic and its impact on the European power system by continuously exchanging information. Furthermore, adequacy will be monitored closer to real-time by RSCs throughout the summer, whereas a strong emphasis will be placed assessing the pandemic impact on adequacy in the Winter of 2020/2021 through the dedicated adequacy assessment to be performed by ENTSO-E.

[5] *Early May 2020*

Adequacy situation

The adequacy situation in the summer of 2020 is rather favourable (Figure 11). Most adequacy concerns – the risk to rely on non-market measures – are identified in Mediterranean Sea islands. This is especially true for Malta, where structural risks are identified. In the mainland of Europe, marginal and occasional risks are identified in Poland (PL00)[6]. Nevertheless, these risks are very low and associated with some extreme scenarios (high unplanned outages combined with low renewable generation).

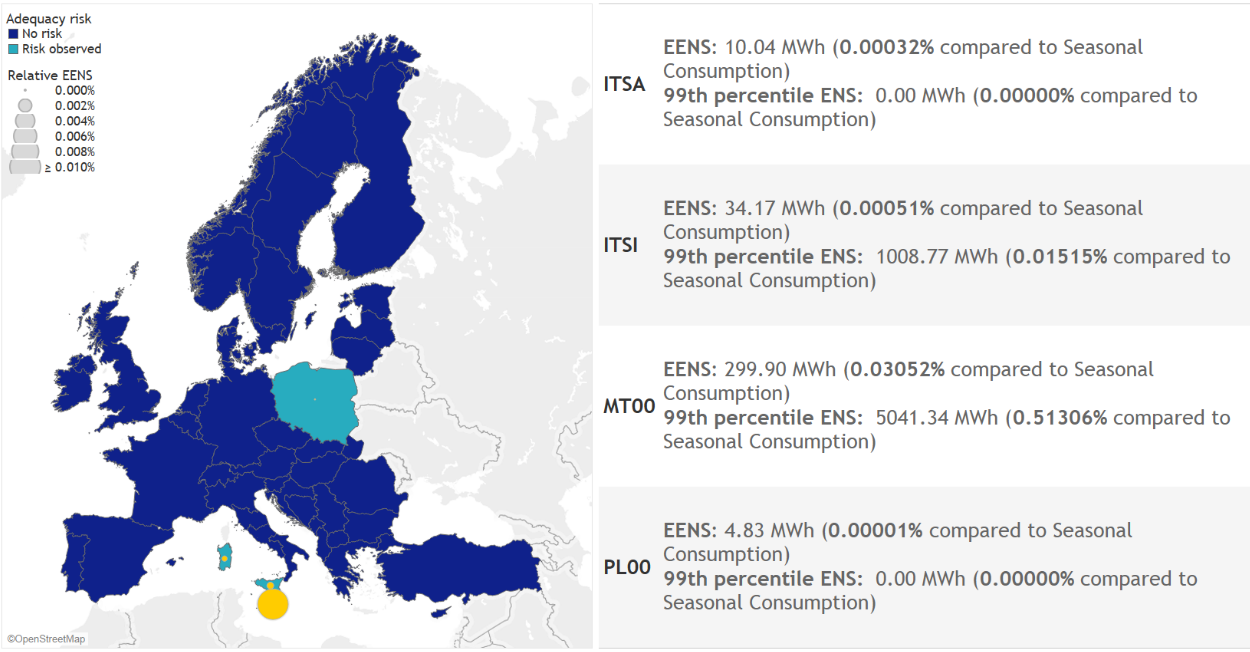


Figure 11 Adequacy risk overview

A detailed examination of the adequacy within Summer 2020 (Figure 12) shows that adequacy should be monitored continuously throughout summer in Malta (MT00) with highest Loss of Load Probability (LOLP) exceeding 5%. In other places, the highest LOLP is lower and the situation should be monitored closer to particular weeks – especially in tighter supply situations.

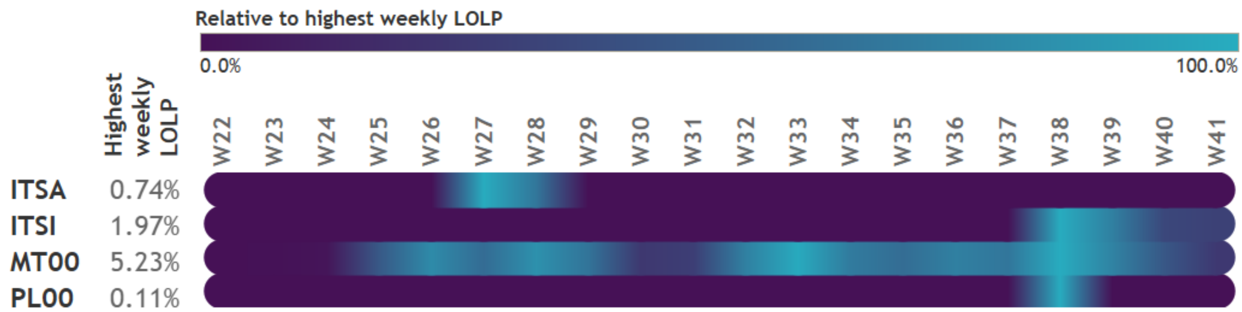


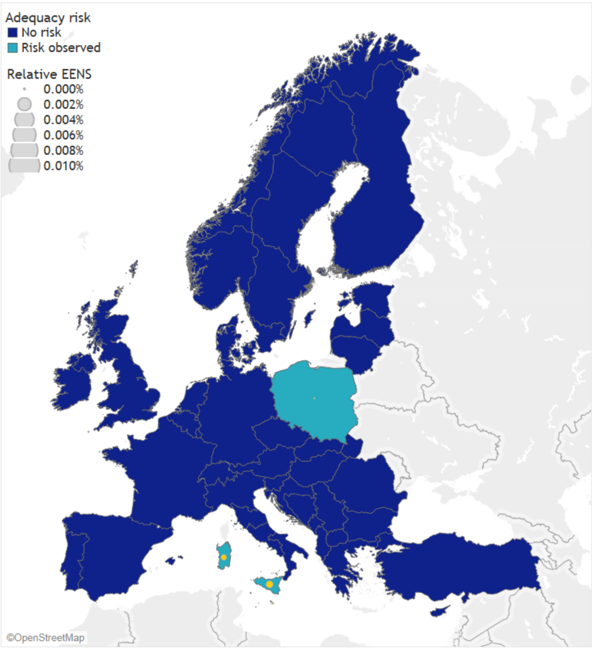
Figure 12 Adequacy weekly insights

[6] *PSE (Polish TSO) has contracted 0.66 GW of DSR for summer 2020, which may be activated in case of inadequacy; however, the mentioned DSR potential DSR was not considered in the Summer Outlook 2020 study as this DSR is procured to be used as a remedial measure and is out-of-market.*

Focus on Malta

Reserves (non-market measure) are an integral part of the power system in Malta and are sufficient to address adequacy concerns in Summer 2020. Interconnection available with Italy (ITSI) helps to minimise the usage of these reserves. Nevertheless, the Maltese power system relies on these reserves during tighter supply moments and especially during the outage of its interconnection with Italy.

The adequacy overview with reserves in Malta considered (Figure 13) shows that adequacy risk in Malta becomes marginal when considering out-of-market counter-measures. These results are comparable with the adequacy situation in Poland (PL00), where adequacy concerns are linked only to some extreme scenarios (high unplanned outages and low renewable generation).



ITSA	**EENS:** 10.04 MWh (**0.00032%** compared to Seasonal Consumption) **99th percentile ENS:** 0.00 MWh (**0.00000%** compared to Seasonal Consumption)
ITSI	**EENS:** 34.17 MWh (**0.00051%** compared to Seasonal Consumption) **99th percentile ENS:** 1008.77 MWh (**0.01515%** compared to Seasonal Consumption)
MT00	**EENS:** 0.16 MWh (**0.00002%** compared to Seasonal Consumption) **99th percentile ENS:** 0.00 MWh (**0.00000%** compared to Seasonal Consumption)
PL00	**EENS:** 4.83 MWh (**0.00001%** compared to Seasonal Consumption) **99th percentile ENS:** 0.00 MWh (**0.00000%** compared to Seasonal Consumption)

Figure 13 Adequacy overview considering non-market reserves in Malta

Weekly adequacy insights show that the adequacy risks are observed only with a very low probability. This finding suggests that risk can be expected only under extreme scenarios – high unplanned outages combined with low renewable generation.

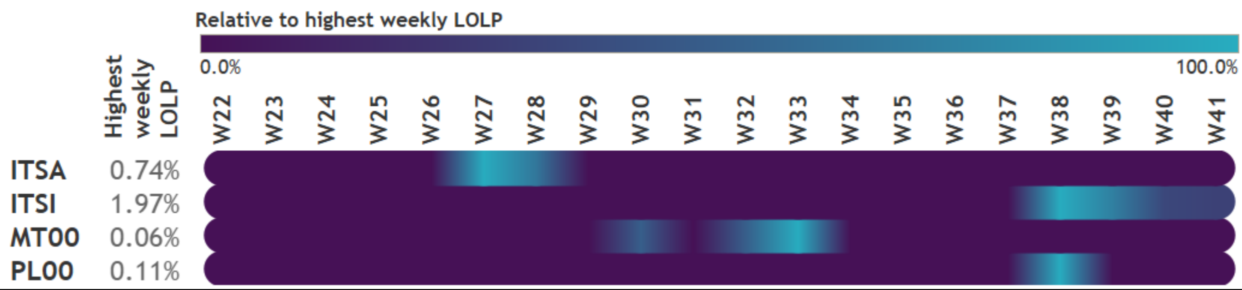


Figure 14 Adequacy weekly insights with reserve consideration in Malta

Figure 15 shows that the interconnection with Sicily helps to considerably reduce the need to dispatch non-market measures. LOLP would reach 29.9% if the interconnector was not available during a typical workday in week 39. LOLP under scenarios where non-market measures are not considered represents the probability that these measures would require activation to cope with adequacy issues. When considering the interconnector being available (under the base case scenario), this probability is expected to stay below 5% in the same week. Nevertheless, the available non-market measures are expected to be sufficient in that week.

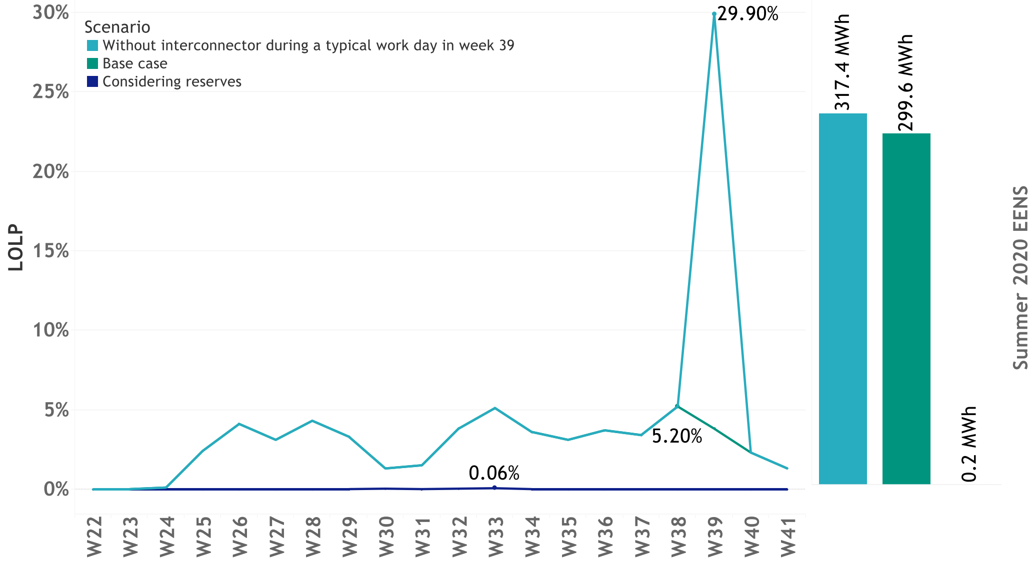


Figure 15 Adequacy in Malta under various scenarios

The situation in Malta can be explained by considering the context of its power system (Figure 16). During the daytime of a typical workday in summer, demand in Malta lies in the approximate range of 300–500 MW depending on weather conditions. Meanwhile, market-based resources consist of 355 MW of thermal generation and 178 MW solar generation, which is weather dependent. Therefore, during the daytime of a summer day, Malta depends on solar generation and imports.

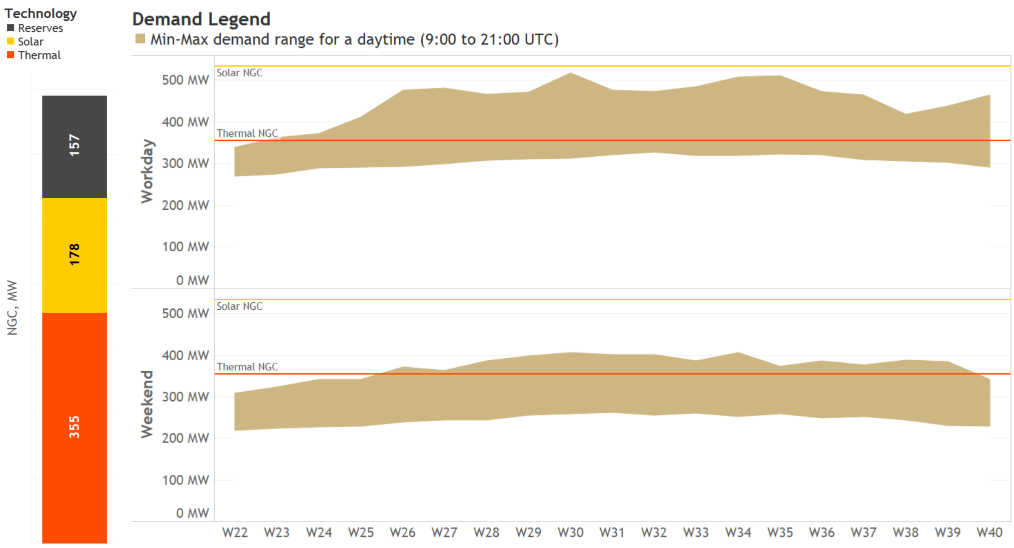


Figure 16 Demand and supply overview in Malta – high dependency on import and solar generation

Winter 2019/2020 Review

The winter review is based on the qualitative information submitted by ENTSO-E TSOs in April 2020 to represent the most important events that occurred during the winter of 2019/2020 and compare them to the study results reported in the previous Seasonal Outlook. Important or unusual events or conditions in the power system and the remedial actions taken by the TSOs are also mentioned. A detailed winter review by country can be found in the separate Country Comments document, if TSOs had anything specific to report.

Overview

The past winter (December 2019 to March 2020) was the warmest on record in Europe. With persistent mild weather over Europe, particularly in the north and east, the average temperature was almost 1.4°C higher than during the previous warmest winter, in 2015/2016.

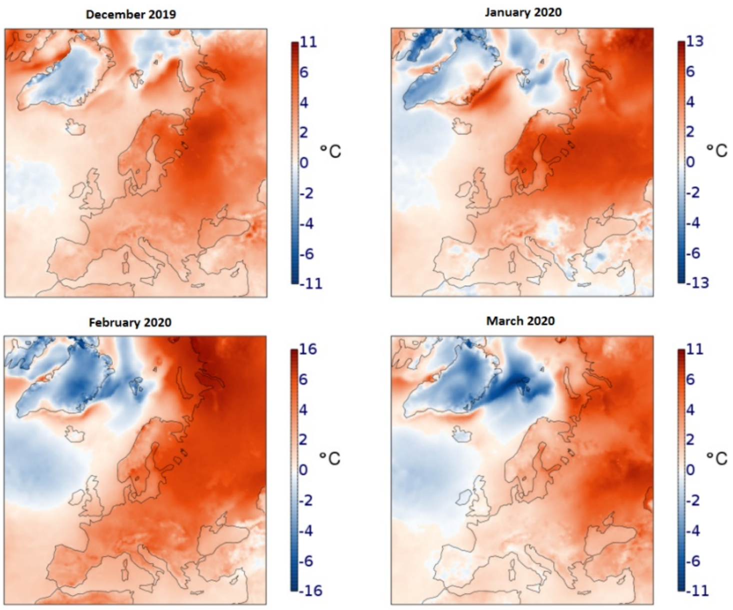


Figure 17 Surface air temperature anomaly in winter 2019/2020 relative to the average of the period 1981–2010[7]

Some voltage regulation challenges were experienced throughout Europe towards the end of the Winter 2019/2020 season. Challenges were mainly linked to decreased demand due to the COVID-19 pandemic and during moments of high renewable generation. This was especially prominent during bank holidays and in regions with important countermeasures in place to cope with the pandemic crisis. TSOs relied on the electricity market signals to address the supply surplus. Furthermore, some TSOs revised transmission system planned outages to ensure that the surplus could be exported and unusual flows in the internal transmission system could be accommodated.

Specific events

The mild winter was favourable for adequacy in Europe. Nevertheless, some events were recorded which are worth mentioning:

- On 23 December 2019, the Malta–Sicily Interconnector was damaged by a ship's anchor causing a nationwide blackout for about three hours. The emergency gas turbines were dispatched to restore supply to consumers within a short time. The interconnector was repaired on 13 March 2020. Until

[7] *Copernicus Climate Change Service–Surface air temperature maps*

then part of demand was automatically shed occasionally to maintain grid stability following generation failures.

- Several winter storms were recorded in North-Western Europe during winter 2019/2020. In Germany, they occasionally caused wind generation to peak. Wind generation curtailment was occasionally necessary to ensure security of system operations. On 22 February 2020 at 20:45, wind generation in Germany reached a new record of 45.6 GW.

- In January, Hungary recorded more frequent and higher unplanned outages than usual. Furthermore, the demand increased compared to the winter of 2018/2019 despite the mild winter. A new demand record of 7105 MW was marked on 5 December 2019. Nevertheless, these circumstances did not pose a risk to security of supply.

- In Sweden, many unplanned outages of nuclear were recorded, either due to technical failures of power plant elements or technical failures of grid elements connecting them to power system. Nevertheless, supply margins remained loose.

Endnote

Summer Outlook 2020 represents the Seasonal Adequacy Assessments defined in Risk Preparedness Regulation (Regulation (EU) 2019/941). ENTSO-E performs this assessment to alert Member States and TSOs about the risks related to the security of electricity supply that might occur in the coming season.

This is a first attempt to implement a new methodology approved by ACER on 6 March 2020 (decision No 08/2020). The methodology is supposed to be implemented one year after approval, but the present assessment already considers many of the requirements set out in the methodology.

Appendices

Appendix 1: Additional material for publication

Figure 18 Study zones

Import capacities from other zones

Sorted by average import capacity

Study zones											
AL00	From: ME00 Avg. 400 MW (400 - 400) MW	From: GR00 Avg. 222 MW (0 - 250) MW	From: RS00 Avg. 204 MW (100 - 210) MW								
AT00	From: DE00 Avg. 4,900 MW (4,900 - 4,900) MW	From: CH00 Avg. 1,200 MW (1,200 - 1,200) MW	From: SI00 Avg. 950 MW (950 - 950) MW	From: CZ00 Avg. 800 MW (800 - 800) MW	From: HU00 Avg. 600 MW (600 - 600) MW	From: ITN1 Avg. 85 MW (10 - 145) MW					
BA00	From: HR00 Avg. 600 MW (600 - 600) MW	From: ME00 Avg. 500 MW (500 - 500) MW	From: RS00 Avg. 491 MW (200 - 600) MW								
BE00	From: FR00 Avg. 1,800 MW (1,800 - 1,800) MW	From: NL00 Avg. 950 MW (950 - 950) MW	From: UK00 Avg. 637 MW (637 - 637) MW	From: LUB1 Avg. 0 MW (0 - 0) MW							
BG00	From: RO00 Avg. 700 MW (700 - 700) MW	From: GR00 Avg. 600 MW (600 - 600) MW	From: RS00 Avg. 284 MW (0 - 300) MW	From: MK00 Avg. 250 MW (250 - 250) MW	From: TR00 Avg. 100 MW (100 - 100) MW						
CH00	From: FR00 Avg. 3,000 MW (3,000 - 3,000) MW	From: DE00 Avg. 1,700 MW (1,700 - 1,700) MW	From: ITN1 Avg. 1,544 MW (1,440 - 1,900) MW	From: AT00 Avg. 1,194 MW (1,000 - 1,200) MW							
CY00	From: CY00 Avg. 0 MW (0 - 0) MW										
CZ00	From: DE00 Avg. 1,500 MW (1,500 - 1,500) MW	From: SK00 Avg. 1,200 MW (1,200 - 1,200) MW	From: AT00 Avg. 900 MW (900 - 900) MW	From: PLE0 Avg. 729 MW (600 - 800) MW							
DE00	From: AT00 Avg. 4,900 MW (4,900 - 4,900) MW	From: NL00 Avg. 4,250 MW (4,250 - 4,250) MW	From: CH00 Avg. 4,000 MW (4,000 - 4,000) MW	From: PLE0 Avg. 2,500 MW (2,500 - 2,500) MW	From: CZ00 Avg. 2,100 MW (2,100 - 2,100) MW	From: FR00 Avg. 1,800 MW (1,800 - 1,800) MW	From: DKW1 Avg. 1,510 MW (200 - 1,780) MW	From: LUV1 Avg. 1,300 MW (1,300 - 1,300) MW	From: LUG1 Avg. 1,000 MW (1,000 - 1,000) MW	From: SE04 Avg. 615 MW (615 - 615) MW	From: DKE1 Avg. 559 MW (400 - 585) MW
DKE1	From: SE04 Avg. 947 MW (0 - 1,300) MW	From: DKKF Avg. 600 MW (600 - 600) MW	From: DKW1 Avg. 590 MW (590 - 590) MW	From: DE00 Avg. 559 MW (400 - 585) MW							
DKW1	From: DE00 Avg. 1,329 MW (500 - 1,500) MW	From: NOS0 Avg. 812 MW (702 - 850) MW	From: NL00 Avg. 700 MW (700 - 700) MW	From: SE03 Avg. 654 MW (0 - 715) MW	From: DKE1 Avg. 600 MW (600 - 600) MW						
EE00	From: FI00 Avg. 1,003 MW (658 - 1,016) MW	From: LV00 Avg. 559 MW (329 - 779) MW									
ES00	From: FR00 Avg. 2,388 MW (1,500 - 2,600) MW	From: PT00 Avg. 2,178 MW (990 - 3,000) MW									
FI00	From: SE01 Avg. 1,480 MW (1,300 - 1,500) MW	From: SE03 Avg. 1,188 MW (800 - 1,200) MW	From: EE00 Avg. 1,003 MW (658 - 1,016) MW								
FR00	From: DE00 Avg. 3,000 MW (3,000 - 3,000) MW	From: UK00 Avg. 1,879 MW (1,000 - 2,000) MW	From: ES00 Avg. 1,761 MW (600 - 2,700) MW	From: CH00 Avg. 1,126 MW (1,100 - 1,300) MW	From: ITN1 Avg. 948 MW (870 - 1,160) MW	From: BE00 Avg. 600 MW (600 - 600) MW	From: LUF1 Avg. 0 MW (0 - 0) MW				
GR00	From: BG00 Avg. 600 MW (600 - 600) MW	From: MK00 Avg. 459 MW (214 - 765) MW	From: ITS1 Avg. 395 MW (0 - 500) MW	From: AL00 Avg. 222 MW (0 - 250) MW	From: TR00 Avg. 95 MW (0 - 100) MW						
HR00	From: HU00 Avg. 1,200 MW (1,200 - 1,200) MW	From: SI00 Avg. 700 MW (700 - 700) MW	From: BA00 Avg. 600 MW (600 - 600) MW	From: RS00 Avg. 247 MW (200 - 250) MW							
HU00	From: HR00 Avg. 1,000 MW (1,000 - 1,000) MW	From: SK00 Avg. 800 MW (800 - 800) MW	From: RS00 Avg. 692 MW (300 - 700) MW	From: AT00 Avg. 600 MW (600 - 600) MW	From: RO00 Avg. 550 MW (550 - 550) MW	From: UA01 Avg. 516 MW (450 - 650) MW					
IE00	From: UK00 Avg. 457 MW (0 - 500) MW	From: UKNI Avg. 439 MW (390 - 450) MW									
ITCN	From: ITN1 Avg. 3,136 MW (2,400 - 3,600) MW	From: ITCS Avg. 2,367 MW (1,600 - 2,500) MW	From: ITSA Avg. 300 MW (300 - 300) MW								
ITCS	From: ITS1 Avg. 3,933 MW (2,600 - 4,600) MW	From: ITCN Avg. 1,684 MW (800 - 2,000) MW	From: ITSA Avg. 887 MW (870 - 900) MW	From: ME00 Avg. 600 MW (600 - 600) MW							
ITN1	From: FR00 Avg. 2,407 MW (392 - 3,150) MW	From: CH00 Avg. 2,205 MW (520 - 3,420) MW	From: ITCN Avg. 1,687 MW (1,100 - 2,300) MW	From: SI00 Avg. 445 MW (75 - 730) MW	From: AT00 Avg. 252 MW (60 - 315) MW						
ITS1	From: ITCS Avg. 9,999 MW (9,999 - 9,999) MW	From: ITSI Avg. 1,076 MW (100 - 1,200) MW	From: GR00 Avg. 395 MW (0 - 500) MW								
ITSA	From: ITCS Avg. 720 MW (720 - 720) MW	From: ITCN Avg. 300 MW (300 - 300) MW									
ITSI	From: ITS1 Avg. 985 MW (100 - 1,100) MW	From: MT00 Avg. 201 MW (0 - 225) MW									
LT00	From: LV00 Avg. 977 MW (752 - 1,202) MW	From: SE04 Avg. 664 MW (0 - 700) MW	From: PL00 Avg. 463 MW (0 - 500) MW								
LUB1	From: BE00 Avg. 380 MW (380 - 380) MW										
LUF1	From: FR00 Avg. 380 MW (380 - 380) MW										
LUG1	From: DE00 Avg. 1,000 MW (1,000 - 1,000) MW										
LV00	From: EE00 Avg. 674 MW (450 - 847) MW	From: LT00 Avg. 438 MW (284 - 584) MW									
ME00	From: ITCS Avg. 600 MW (600 - 600) MW	From: BA00 Avg. 500 MW (500 - 500) MW	From: RS00 Avg. 444 MW (0 - 650) MW	From: AL00 Avg. 400 MW (400 - 400) MW							
MK00	From: GR00 Avg. 698 MW (339 - 1,017) MW	From: RS00 Avg. 449 MW (150 - 600) MW	From: BG00 Avg. 299 MW (274 - 300) MW								
MT00	From: ITSI Avg. 201 MW (0 - 225) MW										
NL00	From: DE00 Avg. 4,250 MW (4,250 - 4,250) MW	From: UK00 Avg. 1,000 MW (1,000 - 1,000) MW	From: BE00 Avg. 950 MW (950 - 950) MW	From: DKW1 Avg. 700 MW (700 - 700) MW	From: NOS0 Avg. 700 MW (700 - 700) MW						
NOM1	From: NON1 Avg. 755 MW (500 - 900) MW	From: SE02 Avg. 274 MW (0 - 600) MW	From: NOS0 Avg. 249 MW (0 - 500) MW								
NON1	From: SE01 Avg. 139 MW (0 - 400) MW	From: NOM1 Avg. 131 MW (100 - 200) MW	From: SE02 Avg. 80 MW (0 - 200) MW								
NOS0	From: DKW1 Avg. 1,126 MW (702 - 1,287) MW	From: SE03 Avg. 948 MW (500 - 2,095) MW	From: NL00 Avg. 700 MW (700 - 700) MW	From: NOM1 Avg. 387 MW (0 - 500) MW							
PL00	From: PLI0 Avg. 800 MW (800 - 800) MW	From: SE04 Avg. 568 MW (0 - 600) MW	From: LT00 Avg. 473 MW (0 - 500) MW								
PT00	From: ES00 Avg. 2,438 MW (1,500 - 3,600) MW										
RO00	From: BG00 Avg. 700 MW (700 - 700) MW	From: HU00 Avg. 500 MW (500 - 500) MW	From: RS00 Avg. 473 MW (300 - 500) MW	From: UA01 Avg. 100 MW (100 - 100) MW							
RS00	From: HU00 Avg. 497 MW (300 - 500) MW	From: BA00 Avg. 464 MW (150 - 600) MW	From: MK00 Avg. 456 MW (250 - 500) MW	From: ME00 Avg. 447 MW (0 - 600) MW	From: RO00 Avg. 373 MW (300 - 450) MW	From: BG00 Avg. 332 MW (0 - 350) MW	From: AL00 Avg. 210 MW (150 - 250) MW	From: HR00 Avg. 199 MW (150 - 200) MW			
SE01	From: SE02 Avg. 3,300 MW (3,300 - 3,300) MW	From: FI00 Avg. 1,054 MW (750 - 1,100) MW	From: NON1 Avg. 303 MW (0 - 500) MW								
SE02	From: SE03 Avg. 7,300 MW (7,300 - 7,300) MW	From: SE01 Avg. 3,300 MW (3,300 - 3,300) MW	From: NOM1 Avg. 284 MW (0 - 600) MW	From: NON1 Avg. 77 MW (0 - 150) MW							
SE03	From: SE02 Avg. 7,300 MW (7,300 - 7,300) MW	From: SE04 Avg. 2,000 MW (2,000 - 2,000) MW	From: NOS0 Avg. 1,212 MW (600 - 2,145) MW	From: FI00 Avg. 909 MW (0 - 1,200) MW	From: DKW1 Avg. 663 MW (0 - 715) MW						
SE04	From: SE03 Avg. 5,400 MW (5,400 - 5,400) MW	From: DKE1 Avg. 1,318 MW (350 - 1,700) MW	From: LT00 Avg. 664 MW (0 - 700) MW	From: DE00 Avg. 615 MW (615 - 615) MW	From: PL00 Avg. 355 MW (0 - 600) MW						
SI00	From: AT00 Avg. 950 MW (950 - 950) MW	From: HR00 Avg. 800 MW (800 - 800) MW	From: ITN1 Avg. 599 MW (250 - 680) MW								
SK00	From: CZ00 Avg. 1,496 MW (1,400 - 1,500) MW	From: HU00 Avg. 800 MW (800 - 800) MW	From: PLE0 Avg. 500 MW (500 - 500) MW	From: UA01 Avg. 400 MW (400 - 400) MW							
TR00	From: GR00 Avg. 189 MW (0 - 200) MW	From: BG00 Avg. 100 MW (100 - 100) MW									
UA01	From: SK00 Avg. 400 MW (400 - 400) MW	From: HU00 Avg. 360 MW (250 - 450) MW	From: RO00 Avg. 50 MW (50 - 50) MW								
UK00	From: FR00 Avg. 1,879 MW (1,000 - 2,000) MW	From: BE00 Avg. 1,000 MW (1,000 - 1,000) MW	From: NL00 Avg. 1,000 MW (1,000 - 1,000) MW	From: IE00 Avg. 457 MW (0 - 500) MW	From: UKNI Avg. 354 MW (0 - 380) MW						
UKNI	From: UK00 Avg. 412 MW (0 - 442) MW	From: IE00 Avg. 398 MW (390 - 400) MW									

Figure 19 Import capacity overview