

Is the energy crisis over?

System adequacy in winter 2023-2024

Baltic Sea Adequacy Working Group

Webinar

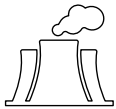
Jarmo Ling

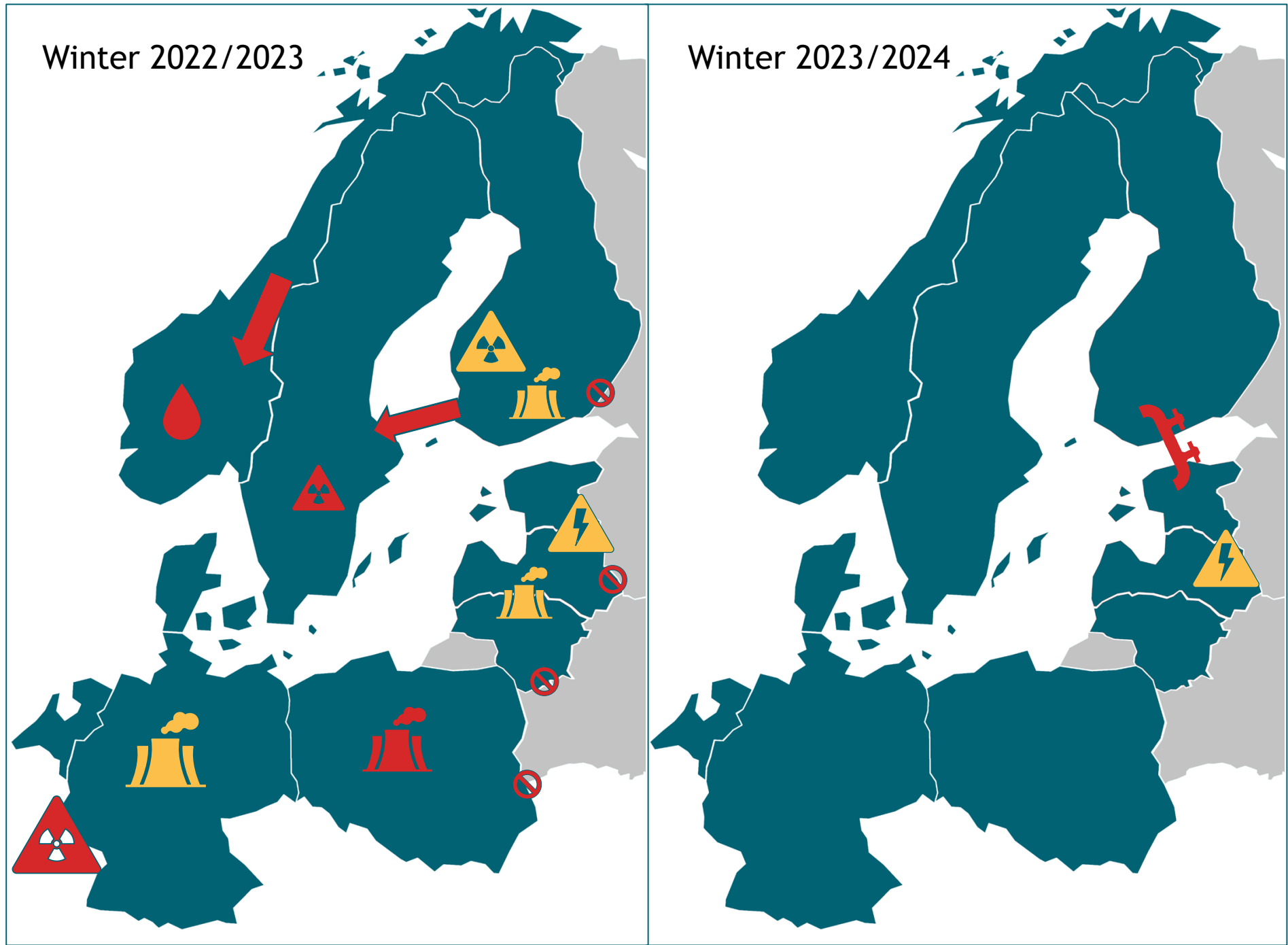
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Agenda

1. Realised and potential risks in the region
2. What has happened since last winter?
3. Fuel supply overview
4. Maintaining critical infrastructure
5. ENTSO-E's Winter Outlook

1. **Realised** and **potential** adequacy risks in the Baltic Sea region

-  Unexpected energy import restriction from third countries
-  Fossil fuel supply challenges in Poland and risks in Germany, Finland, and the Baltics
-  Low hydro reservoir levels
-  Nuclear generation outages and/or risks for delays in start-ups
-  Grid bottlenecks
-  Risk of unexpected Baltic countries desynchronisation from Russian electricity system
-  Gas supply disruption



There will always be risks related to longer cold spells, which could have unpredictable outcomes.

1.2 Comparison of risks between winter 2022/2023 and 2023/2024 in the Baltic Sea region



- Last year Europe was highly dependent on Russian energy imports. This winter either alternative supply sources have been found and the dependence has reduced significantly, or the market has had enough time to adjust to the new status-quo.



- Last year there were risks that due to gas, coal, lignite supply disruptions from Russia there would not be enough fossil fuels to supply power plants with fuel for generating electricity over longer periods of cold weather. This year there are no significant risks as last years' experience and smaller adjustments by different stakeholders has increased the efficiency of the market.



- Baltic Connector gas pipeline between Estonia and Finland is under maintenance for the entire winter 2023/2024



- The availability and reliability of nuclear capacity is much better this winter.
 - In the Nordics
 - Last winter Oskarshamn 3 (1400 MW) had many outages, which raised concerns over its availability throughout the winter
 - Ringhals 4 (1130 MW) was unavailable for the entire winter
 - Olkiluoto 3 (1600 MW) was mostly unavailable or was producing according to its commissioning protocol. Commissioning date was postponed several times due to various issues, which increased uncertainty in the region
 - In Central Europe the French nuclear had historically low availability, but three German nuclear PP-s were producing. This year all of the remaining 4056 MW of German nuclear was decommissioned, while French fleet is coming back online. Overall situation in the Central Europe is better
- Last year the Nordic hydro reservoirs started filling very late in the year after a long drought in the summer, which raised many concerns over how to plan electricity production from hydro over the winter. This year the reservoirs levels are higher.



2. What has happened since last winter?

1

Baltic synchronization status

- The Baltics have installed synchronous condensers to ensure grid inertia
- Updated contracts and plans for unexpected synchronization
- The plan for synchronization was brought up to beginning of 2025
- Constructing new and reconstructing old power lines.
- Harmony link (between LT and PL) was postponed.

2

Fuel supplies

- New LNG terminals in Estonia and Germany
- The LNG system will be developed further
- Fuel switching, efficiency investments (warm winter) have lowered gas consumption

3

Demand flexibility

- Society understands energy market signals better and is more involved than ever
- Demand is more price sensitive
- Challenging places in energy market setup were discovered and are reformed

4

Investments in the energy sector

- Increase of installed renewable capacity
- Decisions over decommissioning of existing power plants was revisited
- Investments in energy efficiency

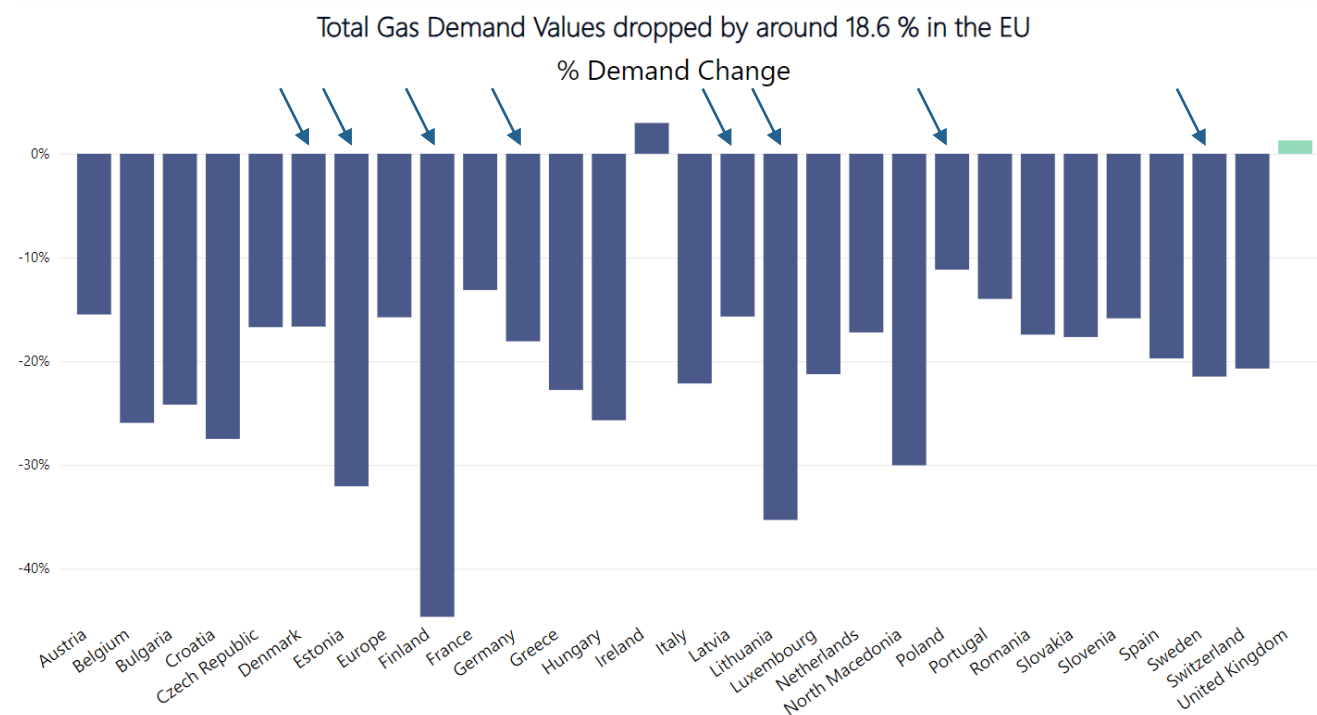
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Physical infrastructure

- On the 8th October due to reasons which are investigated, the gas pipeline between Estonia and Finland was damaged. It will remain under maintenance throughout the winter
- This has sparked discussions over the options of securing critical elements

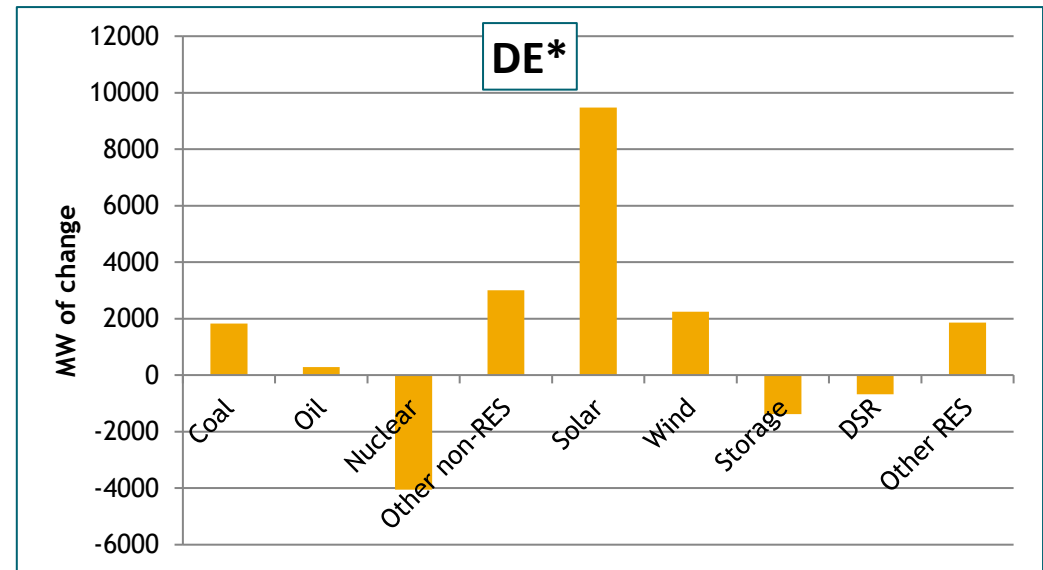
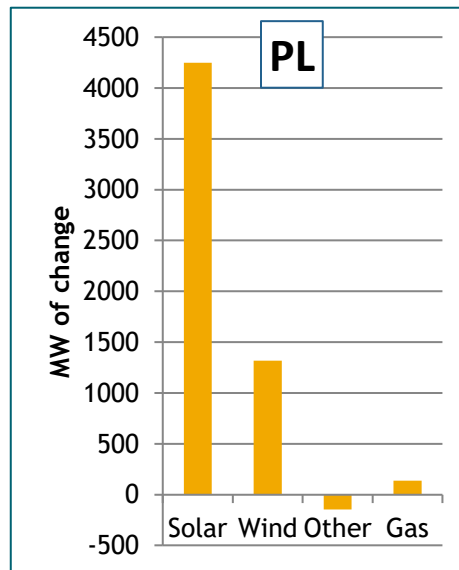
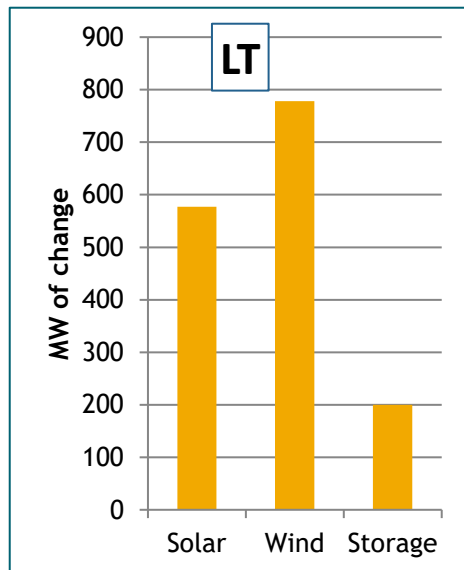
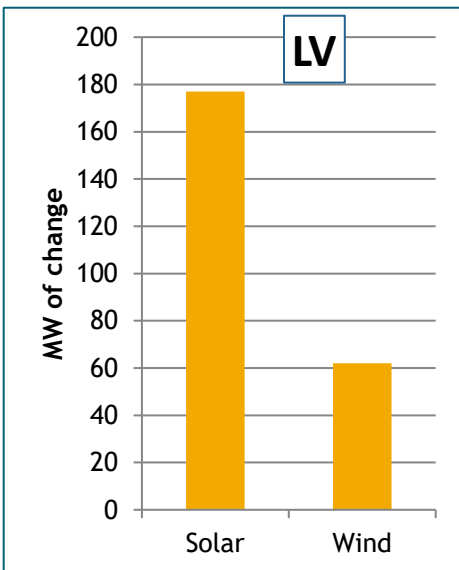
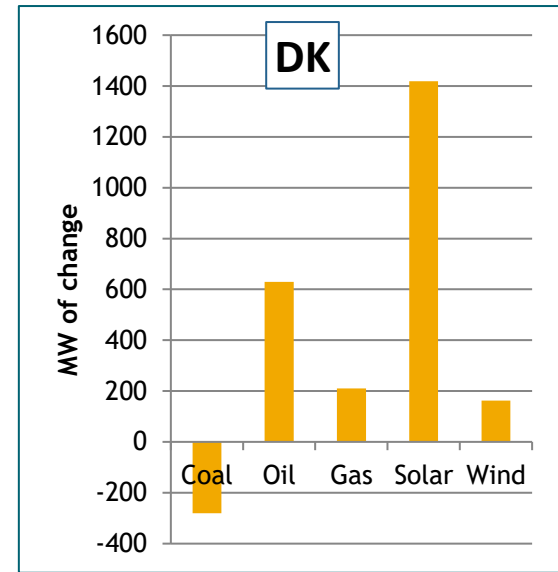
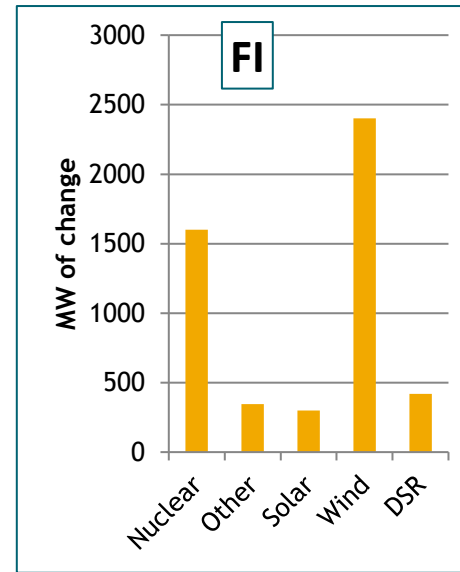
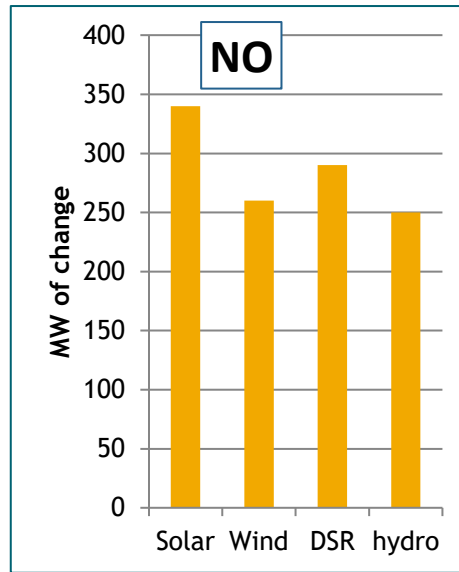
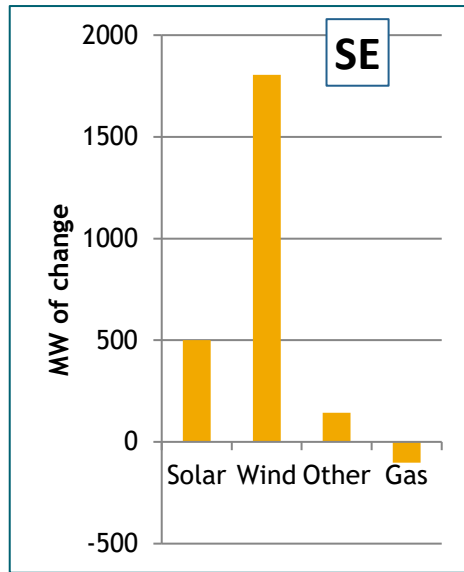
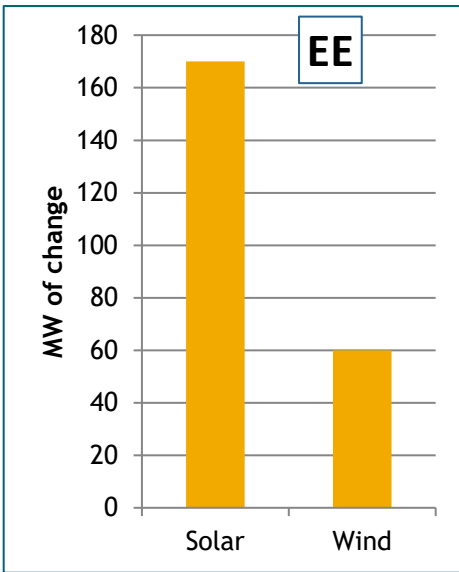
2.1 What has happened since last winter?

- EU in general had decreased gas consumption by 15,8% from winter 2021/22 to 2022/2023
- The top 3 countries with the highest demand decrease percentage were Finland, Lithuania and Estonia.
- A portion of gas demand decrease came from warmer than expected winter



Source: ENTSO-G

2.2 Capacity change from last year

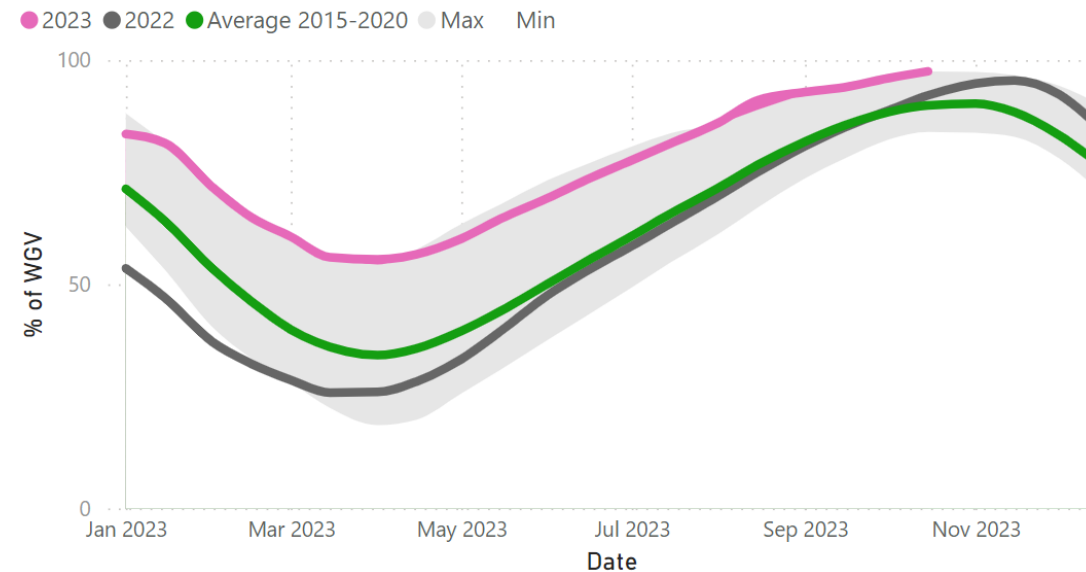


*The negative values concerning to DSR and Batteries are the result of an updated data basis.

3.1 Fuel supply- gas

- The market has adapted well within one year and has found alternative sources of gas to replace Russian pipeline gas imports.
- During a **normal/reference winter** no gas demand curtailment is expected even within main sensitivities scenarios like Russian supply disruption and low LNG supply- end of winter gas storage levels may vary
- During **cold winter** no demand curtailment is expected when no restrictions in LNG imports are happening. Infrastructure is capable of supplying the needs.

Storage evolution vs 2015-2020

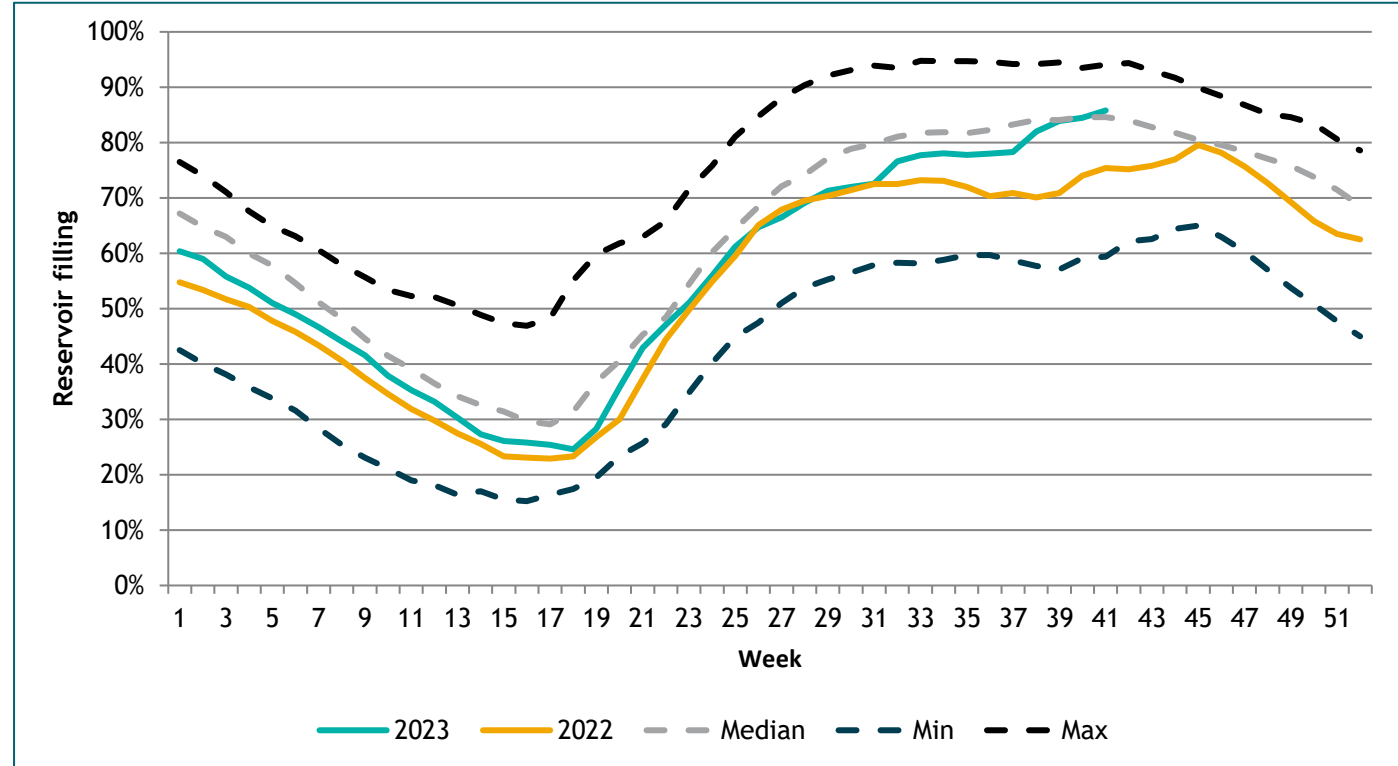


Source: <https://www.entsog.eu/outlooks-reviews>

3.2 Fuel supply- hydro

Hydro reservoir levels in the Nordics are better than last year and the median for the last 20 years.

- All time maximum was 121 TWh in 2012, this year 109 TWh- 86% filling
- Last year same time 96 TWh-> 13 TWh less



Source: <https://hydro-reservoir.nordpoolgroup.com/rescontent/area/rescontent.cgi>

4. Maintaining critical infrastructure

Could have these been prevented?

- In september 2022 Nordstream 1 pipeline was damaged by explosives. In October 2023 Baltic Connector pipeline was damaged by a ship anchor- the authorities are investigating whether it was intentional or not.
- TSO-s have thousands of km-s of power lines, subsea cables and pipes, thousands of substations and other critical infrastructure
- Preventing any deliberate attack on the infrastructure is mostly infeasible
- Regardless of the goal is to be able to identify the problem, contain it, and fix it as soon as possible. Also find a balance between putting resources into guarding such elements and the cost of doing so.

Nordstream 1- September 2022



Baltic Connector- October 2023

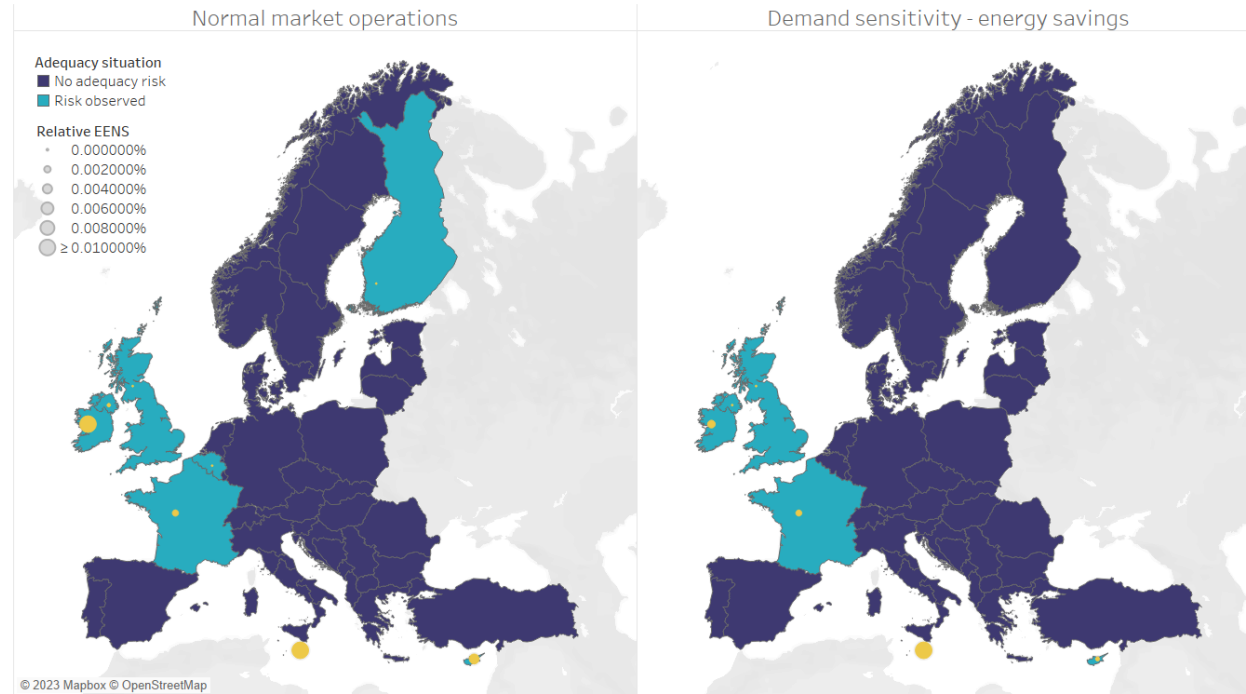


5. Winter Outlook 2023/2024

ENTSO-E's state-of-the-art Winter Outlook shows no major adequacy risks in the region.

In an unlikely situation Finland could experience marginal adequacy risks (LOLE=0,013 h)

TSO-s will use this resource to model regional sensitivities and will analyse the results deeper for more insight.



6. Main conclusions

- Many different adequacy risks, which were relevant last winter are not a problem this winter. Some local adequacy risks remain, especially during longer cold spells.
- There is still a risk for the Baltics for an unexpected desynchronization from the Russian (IPS/UPS) grid, but with every month this becomes more manageable.
 - If this should realize the Baltics will synchronize with the CESA system within hours according to contingency plans and contracts with neighbors.
- This winter the following risks have lowered compared to previous winter:
 - Water reservoir levels are 10% higher in the Nordic reservoirs
 - Nuclear power plants availability is much higher in the Nordics and France
 - Gas reservoir levels are over 94% of maximum capacity and most supply lines are working
 - Gas pipeline between Estonia and Finland is damaged and remains offline until the end of the winter, but combination of underground gas storage and LNG terminals are sufficient to cover the gas demand.
- Sabotage or accidents around different infrastructure elements has increased, and it challenges stakeholders to discuss contingencies

end of presentation



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