

Energy Regulatory Office

<https://www.ure.gov.pl/en/communication/news/340,Available-capacity-in-the-national-power-system-is-diminishing.html>
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Available capacity in the national power system is diminishing

The President of URE reviewed the investment plans of electricity generators until 2036

The available capacity in the national power system (NPS) is forecast to decline over the next fifteen years; such are the conclusions drawn an analysis of data collected from 69 power generators that were required to ⁽¹⁾ submit plans for investment in new generation capacity for 2022-2036 to the regulator.

New solutions needed

The data reviewed by URE shows that, despite a steady increase in installed capacity in the system, the available capacity is actually falling due to the accelerated development of renewable energy sources. *"This implies the need to introduce new market solutions to ensure stable operation of the national power system, such as flexibility and demand management services, but also to maintain the existing capacity mechanisms"* commented Rafał Gawin, President of URE.

Although only a fraction of licensed power generators operating in Poland (i.e. generators with units of 50 MW or more) were surveyed, the report's conclusions confirm the trends observed by the regulator in the power sector and thus provide a basis for drawing meaningful conclusions and assessing the entire sector and the challenges it faces.

Gas, offshore wind farms and photovoltaics to provide a capacity of 22 GW

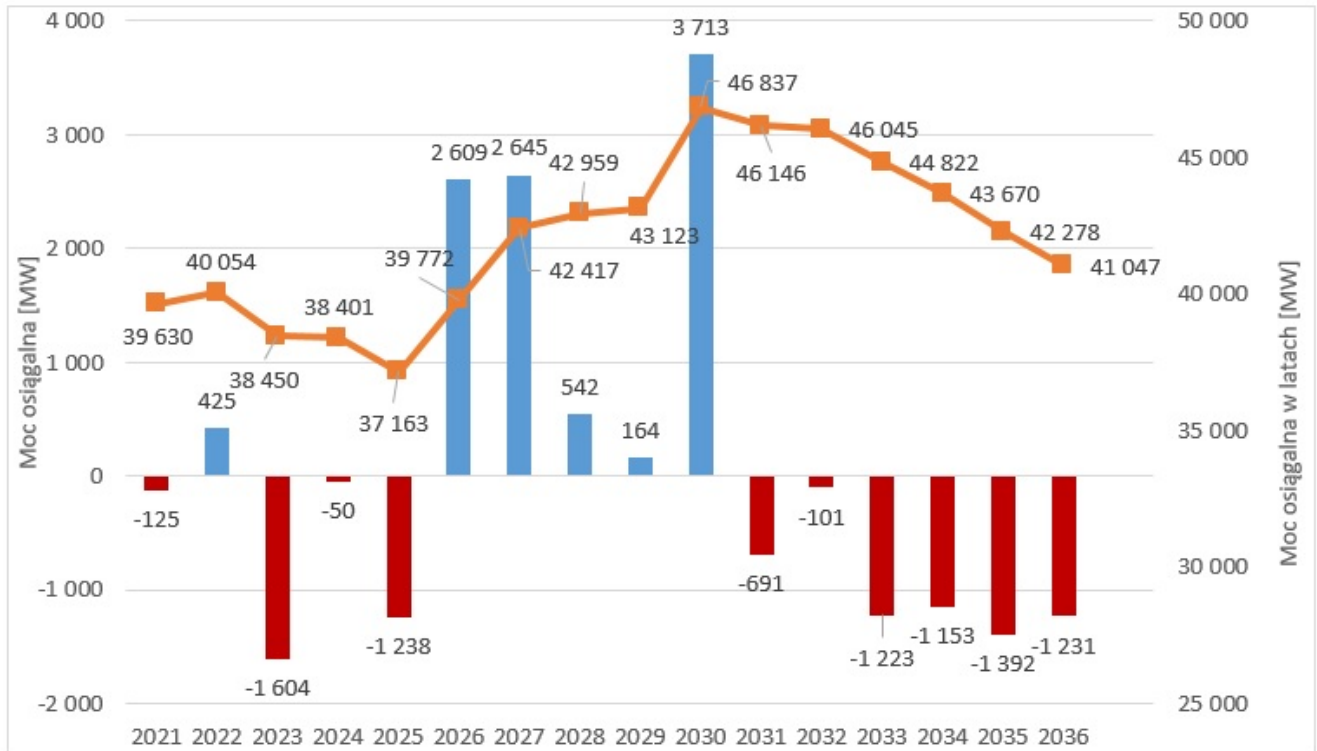
By 2036, the surveyed power companies plan to commission new generation capacity exceeding 22 GW. The largest investments are planned in generation units based on: natural gas (9.8 GW), offshore wind farms (5.2 GW) and PV (5.7 GW). The availability of some of the new capacity will therefore be weather-dependent and at the same time significantly lower than the availability of the conventional coal-based units being withdrawn from the system.

At the same time, the generators surveyed plan to decommission units with a capacity of around 20 GW. Mainly coal and lignite-fired generating units will be withdrawn from the system. Economic inefficiency and obsolescence were indicated as the main reasons for phasing out coal technologies. Entrepreneurs also declared that a small fraction of onshore wind, biomass and gas capacity will be put out of operation.

Overall, the following major changes in the fuel technology mix are expected: between

2022 and 2036, the share of coal-fired generating units will decrease the most (from approx. 21 GW to approx. 11 GW), while gas-fired units will see the largest increase (from approx. 3.3 GW to approx. 13 GW).

Fig.1. Generators' investment plans for 2022-2036: balance of generation capacity (new generating capacity (+) upgrades (-) decommissioning)^[2].



Source: URE on the basis of survey results.

The analysis of the data collected shows that the measures taken by the surveyed generators will result in a slight increase in the generation capacity^[3] from 39.6 GW in 2021 to 41 GW in 2036. The observed loss of generation capacity in the capacity balance between 2023 and 2025 and then 2031 and 2036 is due to the planned decommissioning of numerous coal and lignite generating units.

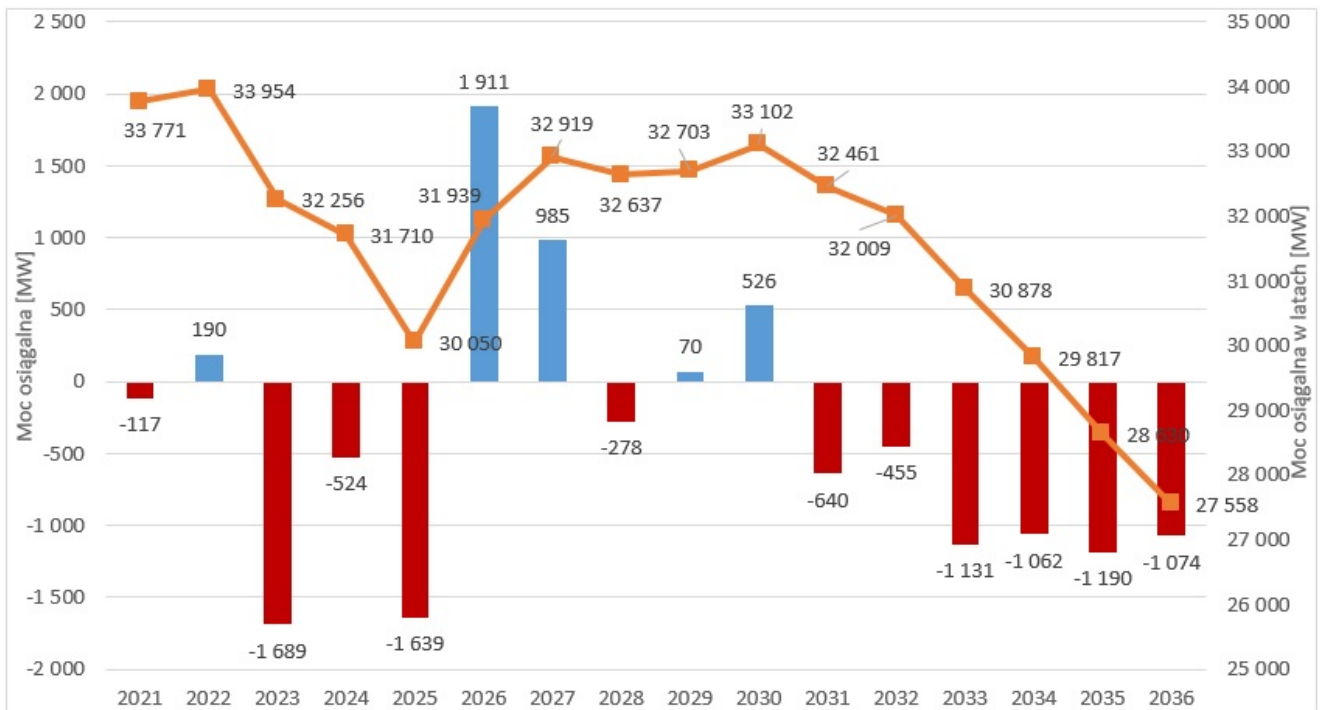
Maximum generation capacity goes up, available capacity goes down^[4].

In order to reliably assess the actual balance of generation capacity resulting from the actions taken by the surveyed generators, it is necessary to apply the so-called adjusted availability factors^[5] (KWD), which indicate the availability of sources depending on the fuel technology used. In the analysis discussed here, these factors for wind and solar sources were further adjusted^[6] to the level of actual availability to the transmission system operator in 2021.

When these factors are applied, the planned incremental capacity of 22 GW in nominal terms translates to approx. 12.6 GW of available capacity. The withdrawal of baseload

generation units (with a high KWD_e) will therefore result in a significant decrease in the generation capacity available to the transmission system operator responsible for balancing and operational security of the NPS.

Fig.2. Generators' investment plans for 2022-2036: balance of generation capacity with the application of KWD_e



Source: URE on the basis of survey results.

What about investment funding?

“According to our survey, generators have funding planned for only half of the investment projects they intend to undertake in the next two years (2024-2026). What is more, practically all projects planned for implementation after 2027 do not have funding secured to date, which puts a big question mark over their successful implementation. Therefore, it should be noted that the planned investments are currently, for the most part, the company’s declarations rather than real, advanced projects with arranged financing” pointed out Rafał Gawin, President of URE.

[1] Pursuant to Article 16(20) and (21) of the Energy Law (Dz.U.2022.1385, as amended), such an obligation is imposed on companies engaged in the generation of electricity from sources with a total installed electrical capacity of at least 50 MW.

[2] Assuming that the current rules for capacity market support are maintained (for coal-fired sources until 2025) and the current legal regime with regard to the EU energy policy.

[3] Maximum generation capacity - the highest sustainable capacity a generating unit or generator, which is maintained by a heat generator continuously for at least 15 hours and by a hydro generator continuously for at least 5 hours, under rated operating conditions, as confirmed by tests.

[4] Maximum generation capacity minus losses due to scheduled maintenance, periodic losses, operational losses and random losses.

[5] Adjusted Availability Factor for individual fuel technologies is set out in Regulation of the Minister of Climate of 10 August 2022 on the parameters of the main auction for the delivery year 2027 and the parameters of the supplementary auctions for the delivery year 2024.

[6] Based on actual data from PSE reports. The so-derived factor is the Expert Adjusted Availability Factor - KWD_e).

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