

Polish implementation plan

(amended version)

Polish language version is the official one. English language version is a courtesy translation.

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I. Introduction

Context

In accordance with article 20 of Regulation (EU) 2019/943 of 5 June 2019 on the internal market for electricity, Member States with identified resource adequacy concerns shall develop and publish an implementation plan.

Poland is a Member State with identified resource adequacy concerns. Therefore **Poland has developed implementation plan.**

This plan includes identification of regulatory distortions and market failures, consideration of improvements and presents a list of market reforms.

Resource adequacy assessments

Under the notification of the Polish capacity market¹, the Polish authorities have demonstrated the existence of market failure and quantified the adequacy issue by means of a detailed probabilistic assessment, which was carried out by the Polish TSO (PSE) and the assumptions and results of which were reviewed by an external consultant. This assessment compares supply and demand adequacy forecasts with a reliability standard, which has been expressed in terms of a Loss of Load Expectation (LoLE).

The adequacy assessment relies on the data that PSE submitted to ENTSO-E for its Mid-term Adequacy Forecast (MAF) 2017 exercise.

In addition to the assumptions used in the MAF 2017, PSE's adequacy assessment tests the following sensitivities regarding the assumptions about the Polish electricity system: higher assumption on mothballing/decommissioning of thermal capacity, increased import interconnection capacity with neighbouring countries against the normal increase assumed in the MAF 2017, and reduced electricity demand growth against the normal demand projection used in the MAF 2017.

In all simulated scenarios capacity shortfalls were expected to arise in 2020 and 2025. In PSE's base case scenario the LoLE reaches 176.4 and 101.7 hours per annum in 2020 and 2025 respectively. In the least conservative scenario, which mirrors the MAF 2017 assumptions, the LoLE was also still above the 3-hour target with 14.2 hours in 2020 and 32.8 in 2025. The external consultant also calculated the volume of dispatchable capacity that would be needed in addition to the capacity assumed in the base case scenario in order to achieve the 3-hour LoLE per year on average. This additional net generating capacity is 2,750 MW in 2020 and 8,068 MW in 2025.

Furthermore, PSE also performed an adequacy assessment for the year 2030 (i.e. beyond the period covered by the MAF 2017 assumptions). The least conservative scenario resulted in 12.56 hours LoLE, which is again higher than the 3-hour target. The other modelled scenarios showed significantly higher

¹ SA.46100 (2017/N) – Poland – Planned Polish capacity mechanism

rates of LoLE (up to 1,165 hours). The external consultant confirmed in this regard that PSE's methodology was consistent with similar resource adequacy studies of ENTSO-E.

In summary, the identified adequacy issue reflected **the lack of available capacity** (account taken of available imports) to meet the demand. Given the magnitude of this adequacy issue, the Polish authorities considered that **it was necessary to intervene through the introduction of a market-wide capacity mechanism.**

Despite the fact that good progress is being made with the concerns over future generation adequacy and security of supply (indicated in recent assessment of ENSTO-E – MAF 2019), due to the ongoing market reforms and capacity market implementation, the capacity market is necessary in ensuring sustained generation adequacy in the long-term.

II. Polish electricity market

Poland carries out an active climate and energy policy and takes appropriate measures across all the dimensions of the Energy Union. Polish energy system and its development plans are defined in National Energy and Climate Plan for the years 2021-2030 which was submitted to the European Commission at the end of 2019.

The Polish authorities continuously monitor a situation on the Polish electricity market. Any cases of potential regulatory distortions or market failures would be identified, monitored and subsequently resolved.

Capacity market

Poland has introduced market wide and technologically neutral capacity market based on capacity auctions. Mechanism has been approved in the EC decision “*State aid No. SA.46100 (2017/N) – Poland – Planned Polish capacity mechanism*”. The first delivery year is 2021.

The capacity market consists of primary and secondary market. The primary market consists of:

- main auction for a given delivery year n carried out during the last two months of the year $n-5$;
- additional auction for a given delivery year n consisting of four simultaneous auctions (each for separate quarter of delivery year) carried out in Q1 of year $n-1$.

Primary market for capacity will be complemented by the secondary one which allows for secondary trading and volume reallocation once the primary market is cleared.

Capacity auctions for units located in Poland are preceded by two-stage certification process consisting of:

- general certification
- and
- certification for the main auction and additional auctions (hereinafter main certification).

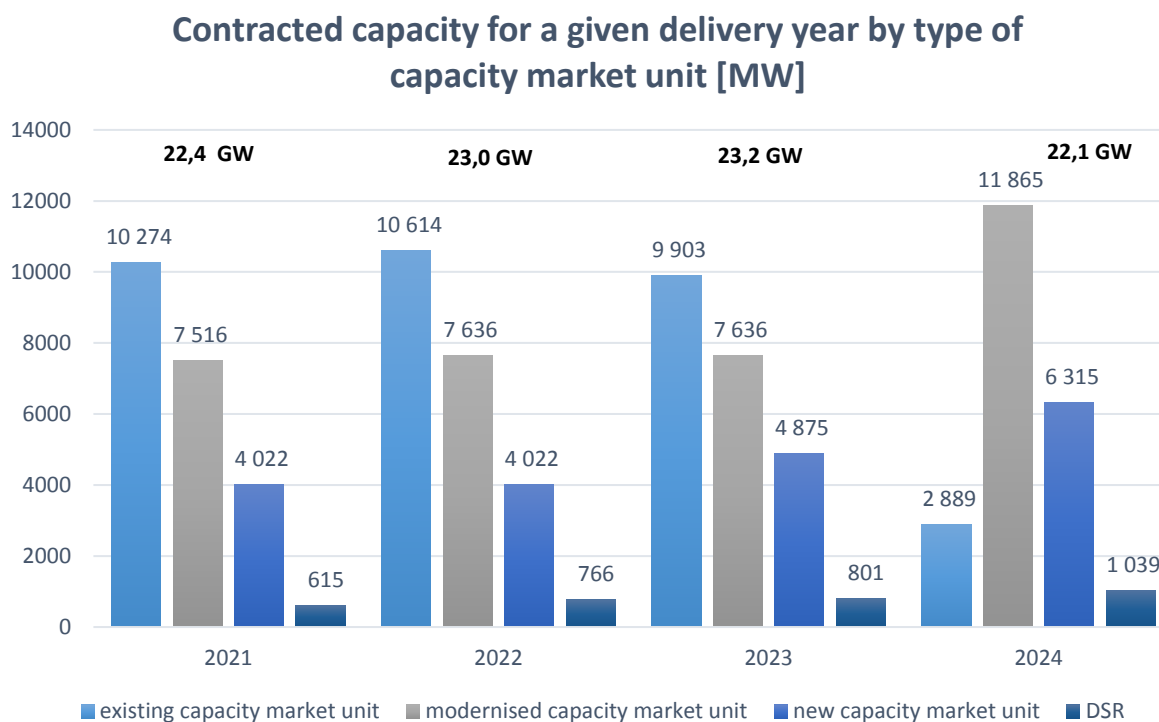
The Polish capacity market is open for all electricity generation technologies including DSR and energy storage. Energy storage is treated as a generating unit, so it can participate in the capacity market as a physical generating unit or a part of DSR unit (part of an end user’s installation).

The capacity market is open for foreign capacity from neighbouring EU countries, whose power systems are electrically connected with Polish power system in the following ways:

- as a “target solution” – based on direct physical unit commitment – possible for a foreign physical unit after PSE (Polish TSO) has agreed with the relevant neighbouring TSO (or relevant TSOs in case of the synchronous profile) on the rules for cooperation, including rules for unit certification, availability testing, remuneration etc.
- as a “bridging solution” – based on interconnector’s participation – before the implementation of the target solution.

Detailed description of the participation of the foreign capacity is included in the EC decision (*State aid No. SA.46100 (2017/N)*, point 2.5).

Four main capacity auctions have been already conducted. Total capacity, by type of capacity market unit, contracted at all main auctions for the 2021 – 2024 delivery periods is presented in a bar graph below.



Source: *Ministry of Climate*

Polish capacity mechanism has been approved for the period of 10 years with an obligation to regularly assess the need to maintain the measure, as well as to adapt it to the provisions envisaged in Regulation (EU) 2019/943 pursuant to article 22(5).

Wholesale market

The volume of gross domestic electricity generation in 2018 was slightly lower compared to the previous year and totalled 165 214 GWh (decrease by 0,38% as compared to 2017). At the same time, gross domestic electricity consumption amounted to 170 932 GWh and increased by over 1,66% in comparison to 2017. In 2018, the rate of increase of domestic consumption of electricity was lower than the GDP increase rate, which – according to preliminary estimates of the Central Statistical Office – amounted to 5,1%. In 2018, the share of imports in the domestic balance of physical flows constituted 7,7% of total electricity fed into, while the share of exports constituted 4,5% of electricity off-taken. As compared to 2017 both these parameters decreased by 0,3 percentage point and 2,1 percentage point respectively. The electricity production structure did not change considerably as compared to 2017. A great majority of generation is still based on conventional fuels that is hard coal and lignite. At the same time, the generation leader in the RES segment was still wind generation. In 2018, the installed capacity in the National Electricity System (NES) amounted to 45 939 MW and the available capacity

to 45 650 MW, which represents an increase by 5,8% and 5,4%, respectively, as compared to 2017. The average annual capacity demand was at the level of 23322.7 MW, with the maximum demand at the level of 26 447.6 MW, which means an increase by respectively: 1,5% and 0,8% as compared to 2017².

Poland takes action to ensure transparency and quality of price formation on the power exchange market. According to legal regulations adopted in 2018, obligation for electricity generators to sell electricity via power exchange was increased from 30% to 100% in 2019.

According to the rules currently in force for the Polish Power Exchange (i.e. the "The Detailed Trading and Clearing Rules for Electricity Traded on the Day-Ahead Market" approved by Resolution of the Management Board No 161/32/19 of June 18th 2019 effective as of June 28th 2019 and the "The Detailed Trading and Clearing Rules for Electricity Traded on the Intraday Market" approved by Resolution of the Management Board No 278/59/19 of November 8th 2019, effective as of November 19th 2019), **there are no other formal or informal price limits** other than those implementing Article 41(1) and Article 54(1) of Regulation 2015/1222 (CACM).

Thus, in case of the day-ahead market, the minimum price is an equivalent of -500 EUR/MWh and the maximum price is an equivalent of +3 000 EUR/MWh. For the intraday market, the minimum price is an equivalent of -9 999 EUR/MWh and the maximum price is an equivalent of +9 999 EUR/MWh.

Balancing market

At the end of 2018, 127 entities participated in balancing market processes, including 22 generators, 9 end-users, 8 network customers, 81 trading companies, a power exchange, 5 DSOs and PSE as the TSO. Technical and commercial data were notified by 46 market operators and concerned 352 scheduling units. In 2018, the total volume of unplanned balancing electricity purchased on the balancing market amounted to 6,22 TWh, which was lower by some 8% in comparison to the previous year and also constituted some 4% of gross national electricity consumption. In 2018, the total volume of unplanned balancing electricity delivered to the balancing market amounted to 9,51 TWh and was by 3,29 TWh higher than the total volume of electricity purchased from the balancing market.

The Polish TSO – PSE is currently developing a comprehensive **reform of the Polish balancing market ("BM reform") which includes e.g. cost-efficient and market-based procurement of balancing capacities**. Public consultation on the new design of the balancing market have begun in November 2019. Balancing market redesign was thoroughly discussed at a number of dedicated workshops with the different stakeholders. Given the regulatory requirements coming from new European regulations and previous commitments towards market reforms in Poland, the planned date of implementation of the balancing market reform was scheduled for the beginning of 2021.

Considering the concerns voiced by the Polish market participants regarding their inability to meet the ambitious project timeline of BM reform under the current COVID-19 pandemic situation, and considering the accumulation of important market design related projects scheduled for completion in the coming months and therefore increasing the risks for interdependent delays, BM reform

² National Report of the President of the Energy Regulatory Office – 2019.

implementation plan will be divided into stages and extended until the end of 2021. The split of the BM reform into stages, presented below, was determined on the basis of an assessment of the possibility of individual works being carried out by PSE and market participants, while striving to maximize the scope of compliance with legal regulations and Poland's obligations arising from the notification process of the Polish capacity market, as well as to maximize improvement of the quality of balancing market mechanisms including market signals generated by balancing market:

Stage 2021:

This Stage aims at maximal possible fulfilment of all relevant legal and regulatory requirements under the current external obstacles, including among other:

- Enabling active participation of the Demand Side Response in the balancing market;
- Enabling active participation of the non-centrally dispatched generation units in the balancing market (so called nJWCD units);
- Enabling active participation of energy storage facilities in the balancing market;
- Enabling updating of the Integrated Scheduling Process bids to the extent possible until the intraday cross-zonal gate closure time, including thorough monitoring of potential market manipulation behaviour of market participants (market power abuse);
- Phase out of the following services:
 - Cold Contingency Reserve (*pol.* Interwencyjna Rezerwa Zimna – IRZ);
 - Operational Capacity Reserve (*pol.* Operacyjna Rezerwa Mocy – ORM);
 - Guaranteed Program of Emergency DSR (*pol.* Gwarantowany Interwencyjny Program DSR – IP DSR);
 - Interventional Operation (*pol.* Praca Interwencyjna – PI);
- Changing of sign convention at the balancing market, adjusting the Polish sign convention to the Regulation 2017/2195 (EBGL) requirements;
- Changing of imbalance prices and settlement rules to improve balancing incentives, by reducing arbitrage opportunities between the wholesale market and the balancing market;
- Improving pricing and settlement rules for congestion management (redispatching);

All above features covered by Stage 2021 shall be effective as of 1 Jan 2021.

Stage 2022:

This Stage aims at fulfilling all remaining relevant legal and regulatory requirements, implementation changes supporting these requirements and improving quality of balancing market mechanism, envisaged by the BM reform plan, including among other:

- Implementation of Scarcity Pricing Mechanism to provide incentives for short term flexibility and send appropriate price signals for balancing energy suppliers;
- Implementation of the balancing capacities procurement, separate for upward and downward regulation in line with the requirements of Regulation 2019/943 and EBGL;
- Implementation of the changes into balancing market rules and processes to ensure the possibility of starting implementation of the European balancing energy platforms;
- Implementation of the updated scheduling and settlement rules for balancing service providers to facilitate effectiveness of the new balancing market rules;

All above features covered by Stage 2022 shall be effective as of 1 Jan 2022.

Energy prices on the balancing market are based on a marginal pricing scheme as set out in Article 30(1)(a) of the EBGL. This approach will be maintained in the BM reform with the necessary adjustments resulting from joining the European balancing platforms in the future. Currently Poland applies the balancing market price limits not lower than intra-day market price caps. These price limits will be updated to the technical limits as determined according to Article 30(2) of the EBGL. It will be done while implementing the European balancing platform for the exchange of balancing energy as set out in the approved methodology developed according to Article 30(1) of the Electricity Balancing Guideline.

According to the article 16 (e) of the EC decision “*State aid No. SA.46100 (2017/N) – Poland – Planned Polish capacity mechanism*” by 1 January 2021, Poland shall introduce **an administrative scarcity pricing mechanism** as referred to in Article 44(3) of the EBGL. The concept of the scarcity pricing mechanism that is planned to be implemented in Poland is described in the BM reform document consulted in November 2019.

The foreseen scarcity pricing mechanism, as described in the BM reform document consulted in November 2019, will provide a price adder to the energy prices on the balancing market varying in function of the amount of the reserve margin in the Polish system. The price adder will be included in the balancing energy prices and imbalance settlement prices. The proposed price adder calculation is based on the Value of Lost Load (VoLL) and the Loss of Load Probability (LoLP), ensuring that when reserves are exhausted (i.e. there are no more available reserves that can be activated by the TSO) the imbalance settlement prices are not lower than the maximum price set in accordance with Article 54(1) of Regulation 2015/1222.

Implementation of the scarcity pricing mechanism is foreseen in Stage 2022 of BM reform. Proper functioning of scarcity pricing mechanism is directly linked to the other changes planned to be implemented under BM reform in Stage 2022, hence its implementation needs to be aligned. This applies above all to the implementation of the updated scheduling process and market based procurement of balancing capacities. Without these elements, the scarcity pricing mechanism will not adequately reflect the balance of supply and demand at the electricity market. In such conditions, the mechanism will generate incorrect price signals, which can be very strong. In particular, market participants will be exposed to high prices resulting from the scarcity pricing mechanism, e.g. in the event of the outages, without the possibility to hedge themselves by maintaining appropriate volumes of fast reserves.

PSE is a formal member and an active player in the development of the European balancing platforms for cross-zonal exchange of the balancing energy according to the EBGL (projects: MARI, PICASSO, TERRE). In case of MARI and PICASSO projects Poland intends to join the platforms on the date when the platforms become operational. Whereas in the case of TERRE project Poland intends to join the platform not later than by 15 January 2022.

Poland closely follows the regional initiatives of TSOs to jointly procure resources for frequency containment reserves (FCR). So far Poland has not faced problems with an access to the FCR service – this service in Poland is required by law to be offered by all centrally dispatched generation units. The required volume of FCR is quite low and corresponding cost is moderate. This is why other projects have higher priority as they are expected to deliver more benefits for market participants and power system security. Currently Poland does not plan to join regional initiatives for procuring resources for FCR.

Retail market

In 2018, similarly to the preceding years, there were five big DSOs operating on the electricity market whose grids are directly connected to the transmission system and which are obliged to separate distribution activity performed by the system operator from other types of activity not connected with electricity distribution (unbundling). In addition, in 2018 there were 171 vertically integrated undertakings designated as DSOs, which are not subject to the unbundling obligation. In 2018 there were five incumbent suppliers and, depending on the area of five “large” distribution system operators, from 123 to 169 alternative trading companies active in the electricity supply to end-users, including households. On the electricity market there were also 171 suppliers acting within undertakings vertically integrated with the DSOs³.

In Poland, final customers benefit from market prices and they can obtain bundled offers, which might be tailor-made solutions that address individual needs of customers. Regulated prices are applicable only for those final customers:

- who have not decided to switch the supplier,
- whose demand is relatively low,
- who are connected to low voltage grid, and
- who are supplied by four suppliers of last resort.

Regulated prices are calculated by the suppliers on the basis of justified costs. President of the Energy Regulatory Office (Polish NRA) verifies their calculation and approves regulated prices in the form of tariffs. Share of the consumption of customers under regulated prices in total electricity consumption is approx. 14,5%.

All consumers, also those who are eligible for regulated prices, can choose offers with unregulated prices (market prices) – and they do so, deciding to switch supplier or applying for a contract with bundled products. This ensures effective price competition among suppliers.

There are currently no decisions regarding the deregulation of prices for eligible households. The measures and timeline will be considered under the process of implementation of the Electricity Directive (EU) 2019/944.

By implementing the Electricity Directive (EU) 2019/944, Poland will adopt its national law in the field of price regulation for households and protection of vulnerable customers in accordance with the relevant provisions, where it will be necessary. As for the most vulnerable customers, e.g. affected by the energy poverty, Poland will assess the number of these customers and will implement appropriate measures in accordance with article 5(5) of the Electricity Directive (EU) 2019/944 and relevant provisions of the Regulation (EU) 2018/1999.

³ National Report of the President of the Energy Regulatory Office – 2019 (summary).

Demand response

All types of demand-side response are eligible to participate in the wholesale electricity markets, including day-ahead and intraday. Demand side response (DSR) units can also participate in the balancing market and provide balancing services. This is done by submitting balancing energy offers to the Polish balancing market, where such offers can influence the balancing price formation. DSR interested in participation in the balancing market needs to be certified. Once the balancing offer from the demand side is accepted by the Polish TSO, market participant who submitted this offer shall fulfil its obligation to deliver, meaning it has to reduce the consumption in line with its offer.

Further developments in improving the possibilities of DSR participation in all markets, as well as specific rules regarding aggregation through independent aggregator, possibility of introducing mechanisms of financial compensation for DSR units (e.g. pursuant to article 17(4) of the Electricity Directive (EU) 2019/944) will be analysed and implemented accordingly in the process of the implementation works, where it would be needed.

DSR may also participate in the capacity market. DSR capacity market units participated and concluded agreements in all previous main auctions. A table below presents an overview of agreements concluded by those units at each capacity auction. Both: number of agreements and capacity contracted by DSR increased.

Table 1. Capacity market auctions - results for DSR

Auction	Number of capacity agreements concluded by DSR units	Capacity obligations resulting from the capacity agreements concluded by DSR units (MW)
Main auction for the delivery year 2021	18	614.60
Main auction for the delivery year 2022	21	761.00
Main auction for the delivery year 2023	22	791.00
Main auction for the delivery year 2024	29	1029.00

Source: *Ministry of Climate*

Decentralised generation

Poland has amended the Act of renewable energy sources⁴ in order to eliminate identified regulatory distortions.

⁴ Polish Act on renewable energy sources, Dz. U. z 2019 r. poz. 1524, <http://prawo.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20190001524>

The scope of a definition of prosumer has been extended. Now, not only consumers but also other final customers may be treated as prosumers under condition that their activity in electricity generation does not constitute their primary commercial or professional activity. Therefore they benefit from more favourable electricity consumption settlement system.

Electricity cooperatives (which may be established by final customers located in rural or urban-rural areas) **may use electricity grid as a “storage facility”**. This means that they generate locally electricity and consume it according to their preferences. If there are any surpluses of this locally generated electricity they may inject it to the grid and consume the respective amount of electricity later on, in practice receiving a discount.

Poland has introduced **feed-in tariff (FiT) and feed-in premium (FiP) systems** to support hydro power plants and biogas power plants. These mechanisms provide a guaranteed price of electricity (FiT) or the right to obtain a negative price balance coverage (FiP) for micro, small and medium installations in dedicated technologies.

A new programme “My Electricity” supporting the development of distributed electricity generation from renewable energy sources has been launched in 2019⁵. It aims at increasing the availability of prosumer solutions in households. The main objective of the programme is **to increase the production of energy from photovoltaic micro-sources** and grant subsidies to more than 200 000 prosumers. The subsidy covers up to 50% of the costs of building a photovoltaic installation with the installed power ranging from 2 to 10 kW, is, however, not more than 5 000 PLN (over 1 100 EUR)⁶. As of 15.01.2020 applications for 21 755 beneficiaries has been approved for more than 108 million PLN (over 25 million EUR).

Engaging consumers requires appropriate incentives and technologies such as smart metering systems. Poland works on the legislation that will start a massive roll-out of the smart meters in its territory. Now, more than 1,5 mln of customers have been equipped with smart meters by the DSOs on the basis of provisions envisaged in the Polish national law. However, in order to make smart meters more widely deployed additional obligation on DSOs has to be implemented. Therefore, Polish Authorities expect that after adoption of new legislation smart meters roll-out will speed up. This new legislation set out all the rules for effective and efficient smart meters deployment like: rules on sharing the costs of roll-out, rules for smart meter installation on demand, new schedule for the massive roll-out, provisions on interoperability and settlements, rules on data management (including data protection), which is required in the Electricity Directive (EU) 2019/944 (articles 19-24 and Annex II) and other relevant EU and national law.

⁵ My Electricity Programme launched, <https://www.gov.pl/web/climate/my-electricity-programme-launched>

⁶ 1 EUR ≈ 4,25 PLN

Cross-border exchange and planned grid reinforcement

Poland significantly increases the amount of interconnection capacities available for trading.

Thanks to the efforts taken, current hourly import capacities available on all Polish borders regularly exceed 2000 MW (achieved *inter alia* by adopting an improved day-ahead cross-border capacity calculation with statistical approach to reliability margins). Besides, Poland has developed an action plan⁷ (in accordance with article 15 of the Regulation (EU) 2019/943) to increase cross-zonal electricity trade by means of grid investments and other measures. Grid investments included in the Action Plan are only a small part of vast and ambitious grid development plan until 2027⁸. More than 200 investments have been planned by the PSE S.A., which will contribute to strong reinforcement of internal grid. Below, a list of some investments relevant for increasing cross-border transmission capacity for trade is attached. Those investments were presented to the EC as a part of Polish commitments from 2019 r.

- Investment program AC synchronous profile:
 - Krajnik – Baczyna (400 kV);
 - Baczyna – Plewiska (400 kV),
 - Mikułowa – Czarna – Pasikurowice (400 kV),
 - Mikułowa – Świebodzice (400 kV),
 - Ostrów-Kromolice (400 kV).
- Investment program DC connection:
 - (Swedish connection) Słupsk – Żydowo-Kierzkowo – Gdańsk-Przyjaźń – Pelplin – Grudziądz – Jasiniec – Pątnów (400 kV),
 - (Lithuanian connection) Ostrołęka – Stanisławów (400 kV).

Polish bidding zone is a part of SDAC (single day ahead coupling) since its establishment, with 2 of its 5 interconnectors with EU countries being covered by the market coupling mechanism. In addition, in November 2019 Poland has joined SIDC (single intraday market coupling). Currently Poland is working towards implementing Interim NTC Market Coupling on its remaining 3 interconnectors and on implementing CORE flow-based Market Coupling, both of which will constitute big steps forward in increasing the efficiency of cross-border capacity allocation and day-ahead price formation. The timeline for these market coupling projects is given by the relevant regional roadmaps.

Electricity interconnectivity indicator determined in point (d) of Article 4 of Regulation (EU) 2018/1999 defines: “the level of electricity interconnectivity that the Member State aims for in 2030 in consideration of the electricity interconnection target for 2030 of at least 15 % ...”. However the exact meaning of this factor (15%) is not specified. “Report of the Commission Expert Group on electricity interconnection targets” developed in November 2017 stated that the previously used formula for calculating interconnectivity indicator does not respond to the challenges facing energy system. The

⁷ Polish Action Plan is available on: <https://www.gov.pl/web/aktywa-panstwowe/plan-dzialania-przyjety-przez-kse>

⁸ Transmission Grid Development Plan until 2027 is available on: <https://www.pse.pl/dokumenty>; Polish title of the document is: Plan rozwoju w zakresie zaspokojenia obecnego i przyszłego zapotrzebowania na energię elektryczną na lata 2018-2027.

Report further recommended that the formula to measure the interconnectivity in the 2030 perspective should refer to the estimated peak load and the estimated installed renewable generation capacity in 2030 as:

- (1) nominal transmission capacity (thermal) / peak load 2030,
- (2) nominal transmission capacity (thermal) / installed renewable generation capacity 2030.

The Expert Group recommended that countries below the threshold of 30% on any of the two formulas should urgently investigate options of further interconnectors. Poland has fulfilled this requirement already today, and it should be expected that it would also meet it by 2030:

- (1) $\sim 11\,000\text{ MW} / 27\,700\text{ MW (net)} = 39\%$,
- (2) $\sim 11\,000\text{ MW} / 20\,100\text{ MW (base case, only onshore, offshore and PV)} = 54\%$.

It should be underlined that the Polish interconnections have sufficient interconnector thermal capacity, but only limited part of it is available to market participants as cross-border trading capacity due to unscheduled power flows through the Polish grid. Currently the import capacities available on all Polish borders regularly exceed 2000 MW. When considering transits and loop-flows through Poland, utilization of Polish interconnectors for trade by Polish market participants or by market participants in other countries outside of Poland (causing transits and loop-flows) is much higher. It is assumed that the implementation of Flow Based approach will address these concerns and will result in the improvement of cross-border capacity calculation and allocation.

Application of the allocation constraints

In Poland there are no administrative restrictions on import/export. The only electricity exchange constraints applied in Poland stem from the need to ensure operational security limits. These constraints take form of cross-border capacities available for trade, reflecting both (i) the technical grid constraints and (ii) the availability of generation and generation reserves in Poland. The latter are referred to as allocation constraints implemented under art 23 of CACM Regulation 2015/1222.

Poland operates under central-dispatch scheme. In a central-dispatch market, in order to provide generation and demand balance, the TSO dispatches generating units taking into account their operational constraints, transmission constraints and reserve requirements. This is realized in the Integrated Scheduling Process as an optimisation process called security constrained unit commitment and economic dispatch (SCUC/ED).

Implementation of allocation constraints by PSE is related to the fact that the responsibility of Polish TSO for system balance is extended to day-ahead and intraday planning time frames. Thus, PSE bears the responsibility, which in self-dispatch markets is allocated to balance responsible parties (BRPs). That is why PSE needs to take care of back up generating reserves for the whole Polish power system.

In order to be able to fulfil its responsibility, PSE applies allocation constraints to ensure operational security of the Polish power system in terms of available generating capacities for upward or downward regulation capacity and the residual demand (residual demand is the part of end users' demand not covered by commercial contracts, i.e. generation self-schedules).

The use of Allocation Constraints in Poland is foreseen by the capacity calculation methodology approved by the Polish NRA and applied today by PSE, as well as the regional capacity calculation methodologies approved by all NRAs from the respective capacity calculation regions as well as ACER. These regional methodologies are currently being implemented by the concerned TSOs.

Poland is planning to improve the application of allocation constraints. Poland conducts a comprehensive and ambitious reform of the balancing market, which includes a new mechanism for ensuring required level of reserves. **Polish TSO plans implementation of explicit procurement of balancing capacities (reserves) before the single day ahead coupling (SDAC).** This measure was proposed by the ACER in the CORE CCM Methodology (ACER Decision 02/2019⁹) as one of the possible solution to decrease the level of allocation constraints applied.

Balancing market reform project is currently ongoing. As described in the Balancing market section above, it will be divided into stages and extended until the end of 2021. Implementation of explicit procurement of balancing capacities is foreseen in Stage 2022.

After implementing new rules on procurement of balancing capacities (reserves), the impact of the allocation constraints on the market results is expected to be significantly limited. It is expected that market forces will provide sufficient incentives for market participants in Poland to follow their commitments related to being in balance on the electricity market. Allocation constraints will thus act as a last resort measure to ensure secure operation of the Polish power system and will become active only if market forces failed to provide appropriate signals. After implementation of the Polish balancing market reform, market price signals will be strengthened in a way, that only extraordinary situation of severe regional adequacy concerns may lead to seeing the effect of allocation constraints (i.e. these constraints will be implemented in the market coupling algorithm, but will not affect the market outcome unless the market fails to ensure adequate availability of generation and generation reserves in Poland).

Polish TSO, in cooperation with DSOs and under supervision of NRA and the Polish policy makers, will work towards fostering the development of measures like flexibility services and demand response activated by the market. Improved system flexibility including flexibility of generation facilities will be the key enabler allowing to mitigate any possible impact of allocation constraints on the market forces.

Further development of the common electricity market should also contribute to using less frequent such last resort measures like allocation constraints. It is believed that implementing flow-based market coupling in Central Europe will strengthen price signals and enable TSOs to use the grid more effectively.

⁹ See Decision 02/2019 of the Agency for the Cooperation of Energy Regulators of 21 February 2019 on the Core CCR TSOs' proposals for regional design of the day-ahead and intraday common capacity calculation methodologies, p. 20-22.

III. Plan of electricity market reforms

Poland is currently carrying out electricity market reforms.

It should be underlined that Poland:

- has implemented the EU target model for cross-border intra-day trading XBID in the so called second wave of countries, and has joined LIP15 and LIP16 (Local Implementation Projects) on its own initiative already during the project, improving the ability of market participants to trade all possible shortages or surpluses of energy as close as possible to real-time;
- has started so called initial trial phase operation in IGCC in February 2020, implementing Imbalance Netting within the scope of the European IGCC project, improving the efficiency of using the generation reserves;
- has improved the currently applied cross-border capacity (NTC) calculation procedures by replacing (i) the deterministic, season-ahead-based approach by a transitional solution in the form of (ii) statistical, day-ahead-based approach, with the aim of increasing the overall AC import capabilities allowing to achieve up to 1 GW during extreme scarcity events in Poland by 1 September 2019. This approach will be used until Flow-Based Market Coupling is implemented, which will be the next step of improvement;
- is timely implementing the commitments taken in the EC Decision *SA.46100 (2017/N) – Poland – Planned Polish capacity mechanism*, such as the removal of price limits on the Polish balancing market;
- is timely implementing the commitments taken by Polish authorities as a part of the EU Pilot (no. EUP(2019)9405) procedure; e.g. by ensuring that the NTC network capacities calculated for the purpose of market coupling on DC connection Poland-Lithuania (from 1 January 2020) shall be at least 70% of the technical capacity under the Electricity Regulation;
- is implementing market coupling on all its borders, with interim NTC Market Coupling solution in 2020 and enduring Flow-Based Market Coupling solution, significantly improving the efficiency of the cross-border capacity allocation mechanism and price formation in Poland.

Facing the unprecedented challenges of the new market design as it was defined in the Clean Energy Package, Poland is continuously working on increasing the effectiveness and appropriateness of the policies, measures and tools already in place. To meet these challenges, Poland introduces a **plan of electricity market reforms**, in particular its short term balancing market reform, with a view to improve price signals during times of scarcity.

Balancing market

Within a framework of Polish plan of electricity market reforms, Poland conducts a comprehensive and ambitious reform of its balancing market, split in two stages as described in Balancing market section in point II.. Below, a list of balancing market reforms to be implemented by 1 January 2021: points a) - d), and by 1 January 2022: point e):

- a) **energy prices on the balancing market will be based on a marginal pricing scheme** as set out in Article 30(1)(a) of the Electricity Balancing Guideline, including the necessary adjustments resulting from joining the European balancing platforms. This will be without

prejudice to the possibility of applying locational price differentiation within the Polish bidding zone by applying full transmission network model in price discovery. If technical price limits are applied on the balancing market, they will take into account the maximum and minimum prices set in accordance with Article 30(2) of the Electricity Balancing Guideline;

- b) Poland will update price limits at the balancing market to the technical limits as determined according to Article 30(2) of the EBGL from the date when those technical price limits become applicable as set out in the approved proposal developed according to Article 30(1) of the Electricity Balancing Guideline;
- c) **all Balancing Service Providers will be allowed to update their Integrated Scheduling Process bids to the extent possible until the intraday cross-zonal gate closure time** as provided in Article 24(5) and 24(6) of the EBGL;
- d) **all market participants will be able to bid or change their energy bids in the wholesale market at least until the intraday cross-zonal gate closure time;**
- e) **an administrative scarcity pricing mechanism will be introduced** as referred to in Article 44(3) of the Electricity Balancing Guideline. The mechanism will be designed to provide a price adder to the energy prices on the balancing market varying in function of the amount of the reserve margin in the Polish system. The price adder will be included in the balancing energy prices and imbalance settlement prices. The price adder calculation will be based on the Value of Lost Load (VoLL) and the Loss of Load Probability (LoLP), ensuring that when reserves are exhausted (i.e. there are no more available reserves that can be activated by the TSO) the imbalance settlement prices are not lower than the maximum price set in accordance with Article 54(1) of Regulation 2015/1222. This will be without prejudice to Poland applying measures to prevent the exercise of market power and strategic behaviour.

Besides, Poland is working with EU TSOs on establishment of the European balancing platforms. Poland intends to participate in **MARI** and **PICASSO** platforms on the date when the platforms become operational. Whereas in the case of project **TERRE**, Poland intends to join the platform not later than by 15 January 2022.

Demand Side Response

In order to enable DSR development, Poland will ensure that:

- **As of 1 January 2021 DSR will be eligible to participate in the wholesale electricity markets** (including day-ahead and intra-day) as well as the balancing market and will be treated in a similar way as other market participants and balancing service providers. DSR can be represented either individually or via aggregators;
- Further developments in improving the possibilities of DSR participation in all markets, as well as **specific rules regarding aggregation through independent aggregator, possibility of introducing mechanisms of financial compensation for DSR units** (e.g. pursuant to article 17(4) of the Electricity Directive (EU) 2019/944) **will be analysed and implemented accordingly** in the process of the implementation works, where it would be needed.

Besides, it should be noted that new legislation regarding **smart meters deployment** with all the rules regarding data management, provisions on interoperability and settlements as well as new schedule for the massive roll-out is in the process of adoption.

Retail market

By implementing the Electricity Directive (EU) 2019/944, **Poland will adapt its national law in the field of price regulation for households and protection of vulnerable customers** in accordance with the relevant provisions, where it will be necessary. As for the most vulnerable customers, e.g. affected by the energy poverty, **Poland will assess the number of these customers and will implement appropriate measures** in accordance with article 5(5) of the Electricity Directive (EU) 2019/944 and relevant provisions of the Regulation (EU) 2018/1999.

Grid reinforcement and interconnection

Poland also presents market reforms, in the field of grid reinforcement and enabling the possibility to increase cross-border exchange, which were drafted and committed by Polish authorities as a part of the EU Pilot (no. EUP(2019)9405) procedure:

- **by the end of 2025**, Poland will **accomplish its transmission investments programs** increasing the overall AC and DC import capabilities allowing to achieve **up to 4 GW** during extreme scarcity events in Poland, provided that during such events the Flow- Based mechanism will ensure that Polish critical network elements are used solely for import into Poland and not for transits. As the ongoing investment programs consist of several, interlinked and consecutively commissioned projects, the overall import capabilities during extreme scarcity events will gradually increase in the following years until 2025.

The increase in import capabilities will be obtained as a result of the following transmission investments programs:

a) Investment program AC synchronous profile:

- Krajnik – Baczyna (400 kV);
- Baczyna – Plewiska (400 kV),
- Mikułowa – Czarna – Pasikowice (400 kV),
- Mikułowa – Świebodzice (400 kV),
- Ostrów-Kromolice (400 kV).

b) Investment program DC connection:

- (Swedish connection) Słupsk – Żydowo-Kierzkowo – Gdańsk-Przyjaźń – Pelplin – Grudziądz – Jasiniec – Pątnów (400 kV),
- (Lithuanian connection) Ostrołęka – Stanisławów (400 kV).

Stepwise realization of the abovementioned transmission investments together with implementation of Flow-Based Market Coupling in Core Region will increase the overall AC

and DC import capabilities during scarcity events in Poland up to **2.5 GW by 1 November 2021**.

- Poland shall ensure that from 1 January 2020, the NTC network capacities calculated for the purpose of market coupling on DC connection Poland-Lithuania shall be at least 70% of the technical capacity under the Electricity Regulation, with exception of the hours when (i) redispatching resources necessary to ensure operational security were not available or (ii) in case of outages affecting the capacity of relevant critical network elements, i.e. due to maintenance or grid reinforcement works.¹⁰

Besides, as it was already indicated, Poland has developed an Action Plan (in accordance with the article 15 of the Regulation (EU) 2019/943) to increase cross-zonal electricity trade by means of grid investments and other measures. Grid investments included in the Action Plan are only a small part of vast and ambitious grid development plan until 2027. More than 200 investments have been planned by the PSE S.A., which will contribute to strong reinforcement of internal grid.

Capacity allocation constraints

- Poland ensures that it will not limit cross-border capacities available on all Polish interconnectors beyond what is strictly necessary to maintain the power system within the operational security limits according to the coordinated capacity calculation procedures established in regional methodologies of the Core, Hansa and Baltic capacity calculation regions as well as relevant EU legislation;
- To make the application of capacity allocation constraints significantly less frequent, Poland intends to change rules on procurement of balancing capacities (reserves). Within a framework of the balancing market reform, by 1 Jan 2022 **balancing capacities (reserves) will be procured explicitly before the single day ahead coupling (SDAC)**.
- The implementation of the new balancing market design will be accompanied by latter analyses on its functioning in terms of proper price signal formation, right valuating of balancing capacities and balancing energy, adequate level of transparency for the stakeholders and its effect on ensuring the security of supply. The functioning of the new market rules and the effectiveness of market forces to ensure adequate availability of generation and generation reserves in Poland will be monitored by Polish TSO.
- The cases of binding allocation constraints are to be notified to and monitored by Polish NRA under the CACM and Regulation (EU) 2019/943 monitoring provisions.

Capacity market

- **Polish capacity market will be regularly reviewed and adapted** to the provisions envisaged in Regulation (EU) 2019/943 pursuant to article 22(5);
- **As of 1 January 2021 the following mechanisms** (measures with availability payment which are already used to support TSO to ensure security of supply) **will be terminated:**

¹⁰ Reform already applied and will be applied in future.

- Cold Contingency Reserve (Interwencyjna Rezerwa Mocy – IRZ);
- Interventional Operation (Praca interwencyjna – PI);
- Guaranteed Program of Emergency DSR (Gwarantowany Interwencyjny Program DSR – IP DSR);
- Operational Capacity Reserve (Operacyjna rezerwa mocy – ORM).

These market reforms respect the principles from Article 3 of Regulation 2019/943.

IV. Conclusion

- Poland as a Member State with identified resource adequacy concerns has developed the implementation plan.
- Poland considered in chapter II all issues which are required in Article 20 of Regulation 2019/943.
- The plan of electricity market reforms includes measures to eliminate any identified regulatory distortions or market failures.
- The timeline for market reforms is strictly defined.
- Poland submitted the implementation plan to the European Commission (EC) and requested its opinion.
- After receiving and analysing the EC Opinion of 16/03/2020, Polish Authorities decided to amend their Implementation Plan as it was requested by the EC. Poland has taken the EC recommendations and comments in the outmost account. As a result, Poland has drafted new Polish Implementation Plan (version amended) and has published it.
- Poland will monitor the application of its implementation plan and will publish the results of the monitoring in an annual report and submit that report to the European Commission, pursuant to article 20(6) of the Regulation (EU) 2019/943.
- Presented Polish Implementation Plan (version amended) is a comprehensive and ambitious plan of electricity market reforms. All stakeholders, both public and private ones, will be involved and affected by the implementation of this Plan.
- The rapid outbreak of the coronavirus has serious impact on various areas of life. Due to the extremely difficult situation now in Poland, Europe and other regions of the world and possible consequences for the economy in the future, Poland could not exclude that there might be the changes in schedule in the implementation of these market reform. In the worst case scenario it might be possible that legislative works will be delayed or even suspended. However, Polish Authorities will strive to implement these reforms without undue delay and in accordance with their commitments.