



Do current regulatory frameworks in the EU support innovation and security of supply in electricity and gas infrastructure?

Country Report - Poland



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EXECUTIVE SUMMARY

Assessment of the NRF and the regulatory practice of the Polish electricity sector

The Polish electricity NRF

The key participants in the Polish electricity transmission sector are:

1. Polskie Sieci Elektroenergetyczne S.A, (herein referred to as the "**Electricity TSO**"), being the sole transmission system operator in the national grid of Poland which owns, operates and develops the stations and lines with voltage of 220kV or above (i.e. 220kV, 400kV, 450 kV and 750 kV);
2. the Council of Ministers authorised to adopt the Energy Policy for Poland setting forth the main assumptions and directions for development of the electricity network¹;
3. the minister competent for energy affairs; and
4. the President of the Energy Regulatory Office (herein referred to as the "**President of ERO**") acting as an independent national regulatory authority.

Extensions and investments in the transmission network are governed by the Energy Law Act as well as the TSO's statute. As a rule, extensions and investments in the transmission network are subject to approval by the President of ERO, who also verifies and approves the methods employed to calculate the tariffs. Tariffs for transmission services are developed based on a bottom-up approach while operational costs are estimated through the application of benchmarking.

There is no statutory obligation in the Polish law, which explicitly requires the TSO to apply innovation in the TSO's activities. Despite that, encouragements to employ innovation in the TSO's investments may be implied in the obligations imposed on the TSO.

The Polish regulatory practice in the electricity sector

The NRF works well in general and stakeholders expressed their satisfaction with the system. Yet, a couple of potential barriers were mentioned by the stakeholders:

- lack of clear and transparent conditions as to the integration of battery energy storage systems with renewable energy sources connected to the power system;
- lack of clear and transparent conditions regarding the right to curtail the generation from wind farms and compensation mechanisms for this type of service.

With respect to security of supply, the NRF is generally considered appropriate, with shortcomings related to flexibility and storage.

Options for improvement

The following options for improvement are considered:

- Promoting innovative projects within the TYNDP;
- Introduction of cost benefit analysis in the evaluation process of projects as part of the project selection process; and
- Potential investments should be compared to an optimal alternative solution.

Assessment of the NRF and the regulatory practice of the Polish gas sector

The Polish gas NRF

The key participants in the Polish gas transmission sector are:

1. OGP Gaz-System S.A, being the sole transmission system operator in the national gas transmission network of Poland;
2. the Council of Ministers authorized to adopt the Energy Policy for Poland;
3. the minister competent for energy affairs; and
4. the President of the Energy Regulatory Office (hereinafter referred to as the "**President of ERO**") acting as an independent national regulatory authority.

The Polish NRF for gas constitutes a cost-plus regulatory scheme whose tariffs are subject to President of ERO approval. The costs of OGP Gaz-System S.A.'s statutory tasks are recouped in the form of gas tariffs. A "cost-of-service" based regulation reflects the point that tariffs and fees approved by the President of ERO should compensate for the justified costs of the TSO's

¹ Art. 15a of the Energy Law Act ("EL").

performance of statutory obligations and regulated business activity. Tariffs are composed of a fixed and variable transmission fee corresponding to 90% and 10% of the TSO revenue and established to offset the fixed and variable costs incurred by the TSO respectively.

Extensions and investments in the transmission network are governed by the Energy Law Act as well as the TSO's statute. As a rule, extensions and investments in the transmission network are subject to approval by the President of ERO.

There is no statutory obligation in the Polish law, which explicitly requires the TSO to apply innovation in the TSO's activities. Despite that, encouragements to employ innovation in the TSO's investments are implied in the obligations imposed on the TSO.

The Polish regulatory practice in the gas sector

The NRF works well in general and stakeholders expressed their satisfaction with the system.

The interviewees, however, identified the following general barriers in innovative ongoing power-to-gas projects:

- a. waste cold recovery from the regasification process;
- b. waste heat recovery from, among others, gas compressors;
- c. energy recovery at gas reduction stations.

The barriers, which may hinder the TSO from innovative investment, lays on the boundaries of ownership of gas-based solution ever more part of energy producing systems.

With respect to security of supply, the NRF is generally considered appropriate, with shortcomings related to flexibility and storage.

Options for improvement

The following options for improvement are considered:

- Promoting innovative projects within the TYNDP;
- Introduction of cost benefit analysis in the evaluation process of projects as part of the project selection process; and
- Potential investments should be compared to an optimal alternative solution.

1. INTRODUCTION

EU support innovation and security of supply in electricity and gas infrastructure?”.

The key objective of the study is to analyse how the existing national regulatory frameworks (NRFs) in the EU guide and incentivise the electricity and gas transmission project promoters to undertake investments. The focus of the study is both on investments in new innovative technologies and investments to increase security of supply. The main objective of the study is to map how the regulatory frameworks in the MSs support such investments and how do these frameworks ensure that the necessary investments are made.

This Country Report provides an overview of both the current legal frameworks and their implementation practice related to investments in gas and electricity transmission infrastructure. As part of this analysis, selected specific infrastructure projects in electricity and gas are discussed. Based on this research, options for improvement are formulated, both relating to the implementation practice and to legal changes.

The Country Report is based on previous study deliverables and analysis. It is divided into two main sections, Section 2 which relates to electricity, and Section 3 which relates to gas. Each of these sections examines the legal framework (Section 2.1 for electricity and Section 3.1 for gas), including specific rights and duties of relevant parties, such as TSOs and NRAs (hereafter also referred to as stakeholders), mechanisms for the financing of investment projects and the regulatory rules regarding innovation and security of supply in particular. Having studied the legal regulatory framework, Section 2.2 for electricity and Section 3.2 for gas examine the regulatory practice in Poland, drawing specifically on stakeholder interviews, and paying particular attention to the regulatory practice related to innovation and security of supply. The functioning of the legal framework and the regulatory practice are illustrated by selected specific projects in Poland. Lastly, options for improvement of the regulatory practice and the regulatory framework are discussed in Section 2.3 for electricity and Section 3.3 for gas.

These options for improvement are taken from a long list of best practises that the project team has compiled based on the analysis of regulatory frameworks in all Member States. We acknowledge that we have not carried out a full analysis of all the costs and benefits of the suggested options. Therefore, some of these options are conditional and there might be reasons that we did not take into consideration not to implement them.

The focus of this report is not primarily on R&D investments and projects, but rather on “innovative” transmission infrastructure related investments. In order to define what “innovative” is in the context of this report, we have introduced the notion of “typological investments” (see Annex I and II). The goal of selecting “typological investments”, which, in our understanding, are categories of investments, was to make the discussion concrete and the investments comparable across countries. The term “typological investment” relates to technical solutions that TSOs can adopt to provide the transmission capacities needed to cover the transmission demand of grid users.

Thus, a typological investment is meant to be a type of solution that can be implemented, in principle, by any TSO in situations in which these solutions are appropriate to provide the desired benefit. Hence, typological investments are not specific to a concrete location or a particular TSO. Annex I provides a list of typological investments in the electricity sector, whereas Annex II provides the same for gas.

Ultimately, these technical solutions contribute to fulfilling the objective to improve or maintain the level of security of supply. It has to be noted that the degree of innovativeness of typological investments can be quite diverse, ranging from construction of conventional assets like AC overhead lines or pipelines with conventional materials and construction methods down to novel concepts of system automation and operation based on recent R&D achievements. Innovation aims at providing the desired level of transmission capacity – determined by the objectives of security of supply (see above) – in a way that is in some way superior to the conventional way, e.g.:

- i. by immediately reducing overall cost as compared to a conventional solution;
- ii. by prospectively reducing overall cost in the future, subject however to a “learning curve” as to the cost level of the innovative solution;

- iii. by accelerating the process of transmission capacity expansion and thus reducing social welfare loss caused by temporarily insufficient transmission capacities; or
- iv. by providing improvements with respect to other criteria that are often difficult to monetarise, like environmental or public acceptance aspects.

Innovative investments, especially those whose benefits fall into category ii., iii. and iv. named above, can face certain barriers and market failures. We have identified five categories of innovative projects, which might encounter potential regulatory barriers (see also Annex III for more explanation):

- a. Capital intensive projects resulting in uncertain future OPEX gains (efficiency improvements / cost reductions) are not incentivised by the regulatory framework;
- b. Projects with potential significant benefits, which would benefit primarily the wider society and where the concerned TSOs are not incentivised;
- c. A roll out and investment in smart grids substituting planned physical investments may provide a reduction in the regulated asset base, but might not be realised due to an increase in tariffs or regulatory disincentives;
- d. Projects with few or no commercial benefits to justify the investment, but with positive social impacts;
- e. Projects, which result in a lower TSO TOTEX, but bring about a shift in the CAPEX/OPEX ratio, which is not incentivised by the regulatory framework.

Our understanding of innovative investments and typological investments, and the categorisation of investment projects in relation to possible regulatory barriers are the basis for the research done in the context of the analysis of the implementation practice in this report.

2. ELECTRICITY

2.1. Legal analysis of the NRF in Poland

2.1.1. Overview of the regulatory framework of Poland – legal rules

The primary legislation governing the Legal Framework for electricity in Poland is the Energy Law Act dated 10 April 1997 (hereinafter, the “EL”) as well as the secondary legislation issued thereunder. The foregoing legislation allocates the main duties and powers within the Legal Framework to the following authorities:

1. the Council of Ministers authorised to adopt the Energy Policy for Poland (for the time being it is the document “Energy Policy for Poland until 2030” adopted by the Council of Ministers on 9 November 2009) setting forth the main assumptions and directions for development of the electricity network²;
2. the minister competent for energy affairs whose duties and powers include:
 - a) development of and public consultations on the draft Energy Policy for Poland as well as coordination of the implementation of that policy as adopted by the Council of Ministers³;
 - b) issuance of secondary legislation setting forth more detailed rules for operation of the electricity networks (currently included in the Regulation of the Minister of Economy of 4 May 2007 concerning detailed conditions for functioning of the electricity system, hereinafter the “System Regulation”) ⁴, calculation of electricity tariffs (currently included in the Regulation of the Minister of Energy of 29 December 2017 concerning detailed rules for calculation of tariffs and settlements for electricity hereinafter the “Tariff Regulation”) ⁵ as well as functioning of the capacity market (including parameters for the capacity auctions affecting demand, price and overall outcome of capacity auctions, detailed rules applicable to performance of capacity obligation services and settlements for such services);
 - c) supervision over security of supply as well as functioning of the national electricity system (the minister competent for energy affairs is also responsible for preparation of the report presenting results from monitoring of the security of energy supplies, including main investments in the electricity transmission grid within the next 5 years affecting internal security of supplies as well as cross-border electricity exchange) ⁶;
 - d) act as a national competent authority responsible for facilitating and coordinating the permit granting process for Projects of Common Interest within the meaning of Art. 8 Sec. 1 of the Regulation (EU) No 347/2013 of the European Parliament and of the Council of 17 April 2013 on guidelines for trans-European energy infrastructure and repealing Decision No 1364/2006/EC and amending Regulations (EC) No 713/2009, (EC) No 714/2009 and (EC) No 715/2009 (“TEN-E Regulation”) ⁷.
3. the President of the Energy Regulatory Office (hereinafter, the “President of ERO”), acting as an independent national regulatory authority within the meaning of the Third Energy Package is obliged to exercise its regulatory powers in compliance with the EL and the Energy Policy for Poland, aiming at balancing the interests of undertakings and consumers⁸. In this context the President of ERO is authorized to:
 - a) issue, amend and withdraw licences for transmission of electricity, certify and appoint the transmission system operator as well as supervise its activities⁹;
 - b) approve the transmission network code¹⁰;
 - c) approve the detailed 10-year network development plan for meeting current and future electricity demand (“TYNDP”) ¹¹;
 - d) approve the TSO’s tariffs for transmission of electricity which are to provide revenues required to finance operation and development of the transmission network¹²;

² Art. 15a of the EL.

³ Art. 12 Sec. 2 point 1) of the EL.

⁴ Art. 9 Sec. 3 of the EL.

⁵ Art. 46 Sec. 3 of the EL.

⁶ Art. 12 Sec. 2 point 3) and Art. 15b Sec. 3-5 of the EL.

⁷ Art. 15g of the 1997 Energy Law.

⁸ Art. 21 Sec. 1 of the 1997 Energy Law.

⁹ Art. 33 Sec. 1 in conj. with Art. 32 Sec. 1 point 3) as well as Art. 9h-9h² of the EL.

¹⁰ Art. 9g Sec. 7 of the EL.

¹¹ Art. 16 Sec. 14 of the EL.

¹² Art. 47 Sec. 2 of the EL.

- e) settle disputes over refusals to interconnect grid users to the power grid, including deciding whether the TSO's refusal to interconnect the grid user is duly justified due to lack of economic and technical pre-requisites for such interconnection;
 - f) approve the Capacity Market Rules (document developed by the TSO which sets forth the detailed rules for functioning of the capacity market and supplementing the statutory regulation of the capacity market as laid down in the Act of 8 December 2017 on the capacity market ("2017 Capacity Market Act")).
4. the Government's Plenipotentiary for Strategic Energy Infrastructure authorized to exercise rights arising from the State Treasury's shares in the TSO, including:
- a) imposing an obligation on the TSO to prepare reports on tasks pursued by the TSO to ensure security of supply as well as identified threats to security of supply¹³;
 - b) approval of investments in excess of EUR 50 million¹⁴; and
 - c) appointment of the Supervisory Board authorized to approve long-term investment and financial plans, corporate strategies and level of indebtedness¹⁵.

The mentioned duties and powers should be exercised in compliance with the basic aims of the EL that include: creating conditions for sustainable development of the country, ensuring energy security, economical and rational use of fuels and energy, development of competition, counteracting the negative effects of natural monopolies, taking into account environmental protection requirements and obligations under international agreements as well as balancing the interests of energy undertakings and consumers.

Polskie Sieci Elektroenergetyczne S.A

According to the EL, only one entity should be appointed as the transmission system operator for electricity transmission networks within the Polish territory, and operate in the form of a joint-stock company with all shares held by the State Treasury of Poland¹⁶. Polskie Sieci Elektroenergetyczne S.A. is the electricity transmission system operator (the "**TSO**") appointed in Poland which owns the entire electricity transmission network in the country and is responsible for its operation and development.

A "cost-of-service" based regulatory scheme

The TSO's investment projects are, in general, financed with revenues coming from the transmission tariff set by the TSO and subject to prior approvals of the President of ERO (according to Art. 45a Sec. 1 of the EL, the TSO is not allowed to provide services at different rates than those resulting from the tariff which was approved by the President of ERO). The tariffs approved by the President of ERO are typically valid for a period of 1 year.

Tariffs for transmission services are developed based on a "bottom-up" approach, with application of benchmarking in respect of operational costs of the TSO. Pursuant to Art. 45 Sec. 1 in conj. with Art. 3 point 21 of the EL, the tariff should be set by the TSO to ensure a set of requirements reported in section 2.1.3.

Limited non-regulated activities

The TSO is not involved in non-regulated activities.

2.1.2. Specific legal rights and duties

Role of the TSO

The TSO is currently certified as TSO for the Polish national high voltage grid. The following transmission tasks apply.

Transmission tasks

According to Art. 9c Sec. 2 of the EL, the TSO is responsible for:

1. security of energy supply by ensuring the operational security of the power system and appropriate transmission capacity of the power transmission grid;

¹³ § 10.2 of the TSO's statute.

¹⁴ § 39.3.2 of the TSO's statute.

¹⁵ § 22.1.6-9, § 24.2 of the TSO's statute.

¹⁶ Art. 9h Sec. 2 in conj. with Art. 9k of the EL.

2. operational management of the transmission grid in an efficient manner, ensuring the required reliability and quality of electricity supply and, in cooperation with distribution system operators, coordinating the operation of a part of the 110 kV grid ("coordinated 110 kV grid") in collaboration with distribution system operators;
3. operation, maintenance and repair of the grid, installations and devices, including interconnections to other power systems, in a manner that guarantees the reliability of power system operation;
4. ensuring the long-term capability of the power system to satisfy justified needs for domestic and cross-border power transmission, including transmission grid expansion and, where applicable, the expansion of interconnections with other power systems;
5. cooperation with other power system operators or electricity undertakings to ensure the reliable and efficient operation of power systems and to coordinate their development;
6. dispatching the capacity of generating units connected to the transmission grid as well as generating units with a maximum capacity of 50 MW or more, connected to the coordinated 110 kV grid, taking into account agreements with transmission system users and technical constraints in that system;
7. management of the transmission capacity of interconnections;
8. purchasing ancillary services necessary for the correct operation of the power system, operational reliability of the system and maintenance of electricity quality parameters;
9. balancing the power system, including the balancing of the current demand for electricity with electricity supply in the Polish power system, management of system constraints and settlement of accounts with the system users resulting from:
 - a. unbalancing of the electricity delivered and received from the Polish power system; and
 - b. management of system constraints.
10. operation of the central commercial balancing mechanism;
11. management of electricity flows within the power transmission system in a manner coordinated with other interconnected power systems and in cooperation with the operators of the power distribution systems, within the coordinated 110 kV grid, considering the technical constraints in the system;
12. purchase of electricity to cover the losses arising in the transmission grid in the course of the transmission of electricity over the grid and the application of transparent and non-discriminatory market procedures for electricity purchase;
13. providing grid users and the operators of other transmission systems with which the transmission system is interconnected with information on the terms and conditions for the provision of electricity transmission services, including the conditions for cross-border trade, grid management and electricity balancing, necessary to obtain access to the transmission grid and for use of the grid, planned decommissioning of generation units interconnected to the transmission system as well as centrally dispatched generation units interconnected to the coordinated 110 kV grid as well as outages of the generation units and balancing offers submitted with respect to such units;
14. developing contingency plans providing for an extensive failure in the power system and the recovery of the system following such failure;
15. enforcement of restrictions on the delivery of electricity, implemented under provisions issued pursuant to Article 11 (6) and (7) of the EL;
16. development of a reference transmission grid model in cooperation with the operators of distribution power systems;
17. preparation of forecasts covering demand for electricity and power in the electricity system;
18. identification of the development needs for both the transmission network and interconnections as well as in the scope of construction of new sources of electricity generation;
19. maintaining an appropriate level of operational security of the transmission power network.

According to Art. 16b of the EL, the TSO is obliged to carry out as a priority the actions necessary to ensure the security of power supply, protection of consumer interests as well as environmental protection while the TSO's profits must be allocated as a priority to perform the abovementioned TSO obligations specified in Art. 9c Sec. 2 of the EL.

Within the general obligation to develop and expand the transmission power network as well as interconnectors (Art. 9c Sec. 2 point 4 of the EL), as set out in point 4. above, the TSO is obliged under Art. 16 of the EL to prepare the detailed TYNDP which is subject to the approval/consent of the President of ERO and taken into account in the course of calculation and approval of the transmission tariff. The plan typically includes list, timelines and overall budget for investments undertaken to both modernize and develop the power transmission grid.

Pursuant to Art. 9g of the EL, the TSO is also obliged to develop the transmission network code which provides for detailed rules applicable to: (a) operation, maintenance, repairs, development as well as interconnection to the Polish power transmission grid, (b) requirements for DSR installations, (c) security criteria for operation of the power grid, (d) cooperation and flow of information among TSO, DSOs and other grid users (e) quality parameters as well as settlement rules related to the provision of transmission services, (f) safety requirements for operation of the power grid, and (g) procedures and settlement rules applicable to the balancing market, congestion management and ancillary services. Upon approval of the President of ERO, the transmission network code is binding upon both the TSO and grid users (including operators of generation units, DSOs as well as end-users).

The TSO also has powers and duties within the Polish capacity market regulated under the 2017 Capacity Market Act. In particular, the TSO is responsible for development of the Capacity Market Rules (detailed rules for operation of the capacity market which supplement statutory regulation) as well as proposals of the parameters for the capacity auctions (actual parameters for the capacity auction are set forth by the minister competent for the energy affairs upon opinion of the President of ERO), certification of the capacity market units, monitoring of capacity investments as well as control over performance of the capacity obligation services.

2.1.3. Mechanism for financing of investment projects

Tariffs

The TSO's investment projects are generally financed with revenues coming from the transmission tariff set by the TSO and subject to prior approval of the President of ERO (according to Art. 45a Sec. 1 of the EL, the TSO is not allowed to provide services at different rates than those resulting from the tariff which was approved by the President of ERO). The President of ERO typically approves tariffs for the period of 1 year.

Tariffs for transmission services are generally developed based on the bottom-up approach with application of benchmarking in respect of operational costs of the TSO. In particular, pursuant to Art. 45 Sec. 1 in conj. with Art. 3 point 21 of the EL, the tariff should be set by the TSO in a manner that ensures:

- a) compensation for the justified costs of the regulated business activity and performance of statutory obligations imposed on the TSO, such costs to be determined by the TSO for the purpose of tariff calculation in a cost-effective manner and due diligence aimed at protecting the interests of customers; and
- b) obtaining a justified return on capital employed in the TSO's business activity, which constitutes the product of: (i) regulatory value of assets employed in the transmission activities (regulatory asset base which corresponds to the net value of fixed assets employed in TSO's activities, less the non-repayable EU subsidies spent to develop the said fixed assets, hereinafter "RAB") and (ii) the WACC indicator calculated based on the WACC pre-tax formula specified by the President of ERO, such formula indicating the way in which companies should calculate individual parameters within that methodology: the structure of asset financing, cost of equity and cost of external capital¹⁷).

Based on Art. 23 Sec. 2 point 3 of the EL, the President of ERO develops a methodology for calculation of the WACC indicator and is further authorised to review and adjust the actual level of justified costs as well as the value of RAB in a way that incentivize efficiency of the TSO's operations and ensures necessary financing for capital expenditures required to implement investment projects within the scope, timelines and budgets approved by the President of ERO under the TYNDP. Based on Art. 47 Sec. 2e of the EL and § 25 Sec. 1 of the Tariff Regulation, in the course of review and adjustment of the justified costs, the President of ERO may apply benchmarking methods. In order to further incentivise cost efficiency of the TSO's operations, the President of ERO may also apply the RPI-X model whereby the justified own costs of the TSO are capped at RPI minus the expected efficiency savings correction co-efficient¹⁸. In any case, the President of ERO approves the final transmission rates calculated as a quotient of: (a) respective justified costs and return on capital employed, and (b) the forecasted volume of services to be rendered by the TSO in given year (also subject to review and adjustment of the President of ERO).

¹⁷ Detailed rules regulating calculation of the WACC indicator for the years 2016-2020 are available in the information of the President of ERO (available in Polish [here](#)).

¹⁸ § 25 Sec. 1 of the Tariff Regulation.

The transmission tariff provides for a number of different fees and rates, which are designed to socialise specific costs involved in transmission activities:

1. fixed and variable transmission fees designated to compensate for general operational and capital expenditures of the TSO which are not socialised with other fees specified below;
2. the so-called “quality fee” – socialising costs related to purchase of ancillary services and power reserve services as well as operation of the balancing market and not otherwise compensated under the balancing settlement rules¹⁹; and
3. the so-called “market fee” – designed to compensate for the TSO’s costs related to making the interconnectors available – to the extent such costs are not otherwise compensated under the Regulation (EC) No 714/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (EC) No 1228/2003²⁰.

The rates of these specific fees are subject to review and adjustment by the President of ERO in accordance with general principles presented above which allows the NRA to regulate the TSO’s budgets for different purposes such as general CAPEX and OPEX involved in operation and development of the transmission grid, purchase of ancillary services and reserves necessary to secure power supply as well as operation, maintenance and development of the interconnectors (to the extent not otherwise compensated under the Regulation (EC) No 714/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity).

Apart from the abovementioned transmission fees and rates, the transmission tariff includes also certain quasi-fiscal fees set forth directly in the statutory provisions and earmarked for specific state aid schemes related to investments in security of power supply or new generation sources (e.g. “transitional fee” designated for compensation of stranded costs as approved by way of the EC decision of 25 September 2007, “RES fee” designated for financing of the auction-based RES incentive scheme approved by way of the EC decision of 13 December 2017 or – starting from 2020 – “capacity fee” designated for financing of the capacity market approved by way of the EC decision of 7 February 2018). Those fees are collected by the TSO and transferred to a separate company named Settlement Operator S.A. (*pl. Zarządca Rozliczeń S.A.*) responsible for settlements under specific incentive schemes and state aid programs.

In general, the TSO’s tariff rates do not depend directly on quality of transmission services provided by the TSO (unlike in the case of major DSOs who are subject to so-called “quality regulation” where the level of justified return on capital employed taken into account in calculation of the DSO’s tariffs is dependent on the quality parameters achieved by given DSO in terms of power supply interruptions, timely completion of interconnections, timelines for acquisition and delivery of metering data).²¹ On the other hand, the TSO is liable for failure to meet the power supply standards, including voltage deviations and interruptions of power supply exceeding the defined standards. The foregoing liability is enforced based on the Tariff Regulation, which provides for the detailed algorithms applicable to calculation of the discounts (penalties) payable for each violation. According to the prevailing case law, such liability is absolute in that the TSO shall be liable for violation and must apply the discounts even if it proves that violation is not attributable to the TSO’s wilful misconduct and/or negligence i.e. no-fault liability.

As the tariffs are calculated and approved on an *ex ante* basis (i.e. based on the forecasts of both justified costs and volume of services to be rendered by the TSO in given year), the actual revenues of the TSO may vary from the projection taken into account at the stage of tariff approval - depending on actual costs and volume of services rendered by TSO in given year. Polish law does not provide for specific *ex post* settlements or adjustments of the tariff revenues due to differences between forecasts and actual performance of the transmission services and investments. Besides, there is no regulation authorizing the President of ERO (or any other authority) to put caps on TSO’s revenues.

¹⁹ § 17 Sec. 1 of the Tariff Regulation.

²⁰ § 18 Sec. 1 of the Tariff Regulation.

²¹ Information of the President of ERO discussing the „quality regulation” rules as applicable to major DSOs is available (available in Polish [here](#)).

Apart from the tariff revenues, certain projects related to the development of the power transmission grid might be financed from EU funds (including Cohesion Fund and the Connecting Europe Facility) and/or benefit from cross-border cost allocation under the TEN-E Regulation. The foregoing financing measures refer in particular to investments qualified as Projects of Common Interest under the TEN-E Regulation. Such financing is taken into account within the tariff procedures in the sense that the justified return on capital employed taken into account for the purpose of tariff calculation cannot be derived from this part of investments, which were financed with non-refundable EU funds. In practice, a number of the TSO's investment projects benefited from EU funds and none of the TSO's investment projects have yet benefited from the cross-border cost allocation under the TEN-E Regulation.

2.1.4. Regulatory rules with respect to innovation

Specific duties of the TSO aimed at encouraging innovation

Polish law does not include any statutory provision that would expressly require the TSO to apply innovations in its business activities. Certain measures encouraging the TSO to implement innovation are, however, implied in the obligations imposed on the TSO, such as:

- a) general responsibility for operational management of the transmission grid in an efficient manner, ensuring the required reliability and quality of electricity supply;
- b) obligation to develop the TYNDP, which would ensure long-term efficiency of capital expenditure and costs, incurred by the TSO and (c) procurement of the DSR services.

As a result, the TSO usually specifies in its TYNDP a budget for innovative investments (under the TYNDP for the years 2016-2025, such budget was earmarked for analytical / innovation works concerning the construction of offshore transmission grid named "Baltic Grid" and energy storage facilities).

Specific duties of the NRA aimed at encouraging innovation

Polish law does not include statutory provision that would expressly require the President of ERO to call for and/or support innovations in transmission services. Certain measures encouraging the President of ERO to encourage innovation are nonetheless implied in the general NRA's obligations to exercise its duties and powers with a view to ensure efficiency of the TSO's operations and long-term efficiency of capital expenditures and costs incurred by the TSO.²²

2.1.5. Regulatory rules with respect to security of supply

Specific duties of the TSO aiming at safeguarding security of supply

The TSO is obliged to safeguard security of supply within the general TSO responsibilities for security of supply, reliability and quality of electricity supply, the long-term capability of the power system to satisfy justified needs for domestic and cross-border power transmission as well as appropriate level of operational security of the power transmission network as specified in Art. 9c Sec. 2 points 1)-4) and 17) and further described in section 2.1.2 above.

Basic instruments undertaken by the TSO in this context are:

- 1 development of the transmission network code which provides for the detailed rules applicable to (a) operation, maintenance, repairs, development as well as interconnection to the transmission electricity network, (b) requirements for DSR installations, (c) security criteria for operation of the power grid, (d) cooperation and flow of information among TSO, DSOs and other grid users (e) quality parameters as well as settlement rules related to provision of the transmission services, (f) safety requirements for operation of the power grid, and (g) procedures and settlement rules applicable to balancing market, congestion management and ancillary services²³;
- 2 managing the balancing mechanism, congestion management, development and enforcement of contingency plans, procurement of ancillary services and reserve services²⁴;
- 3 the TSO's duties and powers related to the capacity market, including development of the capacity market rules (detailed rules for operation of capacity market supplementing) as well

²² Art. 9h Sec. 7, Art. 16, Art. 23 Sec. 2 points 3a), 15), 20g) in conj. with Art. 9c Sec. 2, Art. 47 Sec. 2e of the EL.

²³ Art. 9g of the EL.

²⁴ Art. 9c Sec. 2 point 6), 8)-9a), 13)-15) of the EL.

- as proposals of the parameters for the capacity auctions (parameters of the capacity market auction are formally set forth by the minister competent for the energy affairs), certification of the capacity market units, organization of capacity auctions, monitoring of investments as well as control of the performance of the capacity obligation services²⁵;
- 4 approval of conditions and timeline of decommissioning of generation units interconnected to the transmission grid (the TSO may formally refuse to consent to decommissioning of the generation unit due to: (a) threat to system security, (b) threat to human life and health and/or (c) threat to environment and in such case is obliged to notify NRA on the unit operator's intention to decommission the generation unit. If the TSO refuses to approve conditions and timeline of decommissioning, decommissioning may be completed exclusively if the said threats disappear)²⁶.

Specific duties of the NRA aimed at aiming at safeguarding security of supply

When exercising duties and powers specified in section 2.1.1, and in particular in the course of appointment of the TSO as well as review and approval of the TYNDP and transmission tariffs, the President of ERO is bound by statutory requirements to ensure security of supply and reliability and efficiency of the power grid as well as comply with the Energy Policy for Poland that describes main investments related to security of supply²⁷. Furthermore, the President of ERO is obliged to: (a) supervise and monitor performance of the TSO's statutory obligations, including obligations specified in section 2.1.2 above and related to security of supply, and (b) monitor general functioning of the electricity system in terms of security of supply²⁸.

In case of exceptional circumstances, the President of ERO has also the following powers:

1. under Art. 40 of the EL, the President of the ERO may order an energy company, despite the expiry of its licence, to continue the activity covered by the licence for a period not longer than 2 years if continuity of such activity is required by the public interest. If the activity ordered by the President of ERO brings a loss, the energy company is entitled to compensation for such loss from the State Treasury in an amount limited to the legitimate operating costs calculated with due diligence and approved by the President of ERO;
2. under Art. 16a of the EL, in case of an imminent long-term threat to the security of electricity supply as determined by the minister competent for energy affairs based on the assessment that either the generation capacities (both existing and under construction) or energy efficiency projects do not ensure long-term security of electricity supply, the President of the ERO shall announce, organize and conduct a tender for the construction of new electricity generation capacities or implementation of projects reducing the demand for electricity supplies.

The powers specified in Art. 16a and Art. 40 of the EL has not been exercised as yet in electricity sector.

2.2. Regulatory practice

2.2.1. Overview over regulatory practice in Poland

Main regulatory barriers

The interviewees deem that the NRA is, in general terms, adequate to support current innovation and security of supply in the Poland.

2.2.2. Regulatory practice related to innovation

Innovative projects

Despite the framework being, in general, adequate to accommodate innovative investments, they mentioned the following barriers:

- Construction law in the field of building permits for network investments of key importance for the system;

²⁵ Art. 14 Sec. 2, Art. 11-68, Art. 82 of the 2017 Capacity Market Act.

²⁶ Point 2.2.2.4 of the Transmission Network Code – Rules for Use, Operation, Exploitation and Development of Transmission Grid.

²⁷ Art. 9h Sec. 7, Art. 16 Art. 23 Sec. 1 of the EL.

²⁸ Art. 23 Sec. 2 points 6b), 20f)-20g) of the EL.

- Environmental protection law regarding environmental decisions for network investments of key importance to the system;
- Energy law regarding the operator's ability to conduct energy storage activities.

Two cases have been brought to attention to illustrate barriers the current NRA may pose two projects:

Energy Storage house: in the current legal environment, the project may raise regulatory risks related to:

- the lack of specification of energy storage services in the context of unbundling rules. In addition, national regulations in the field of distribution; and
- transmission fees resulting from EU regulations hinder the use of energy storage facilities by market entities due to double transmission charges.

NEDO: the main legislative barriers in the national law include:

- lack of clear and transparent conditions in Polish regulations regarding the integration of battery energy storage systems with renewable energy sources connected to the power system;
- lack of clear and transparent conditions in Polish regulations regarding the right to curtail the generation of wind farms and compensation mechanisms for this type of services.

Possible improvement of the NRF

The interviewees did not suggest any improvement during the interview.

Adequacy of the NRF relating to its support for innovative investments

The interviewees did not evaluate how adequate the current NRA is as to innovation during the interview.

According to the definition adopted in PSE, innovative work consists in the implementation of a new or significantly improved product (product or service) or process, a new organizational method or a new marketing method in economic practice, workplace organization or relations with the environment. Products, processes, and organizational and marketing methods do not have to be new to the market in which the Company operates, but must be at least a novelty for the company itself.

Products, processes and methods do not have to be developed by the Company itself and may be developed by another company or by a unit of a different nature (e.g. a research and development institute, a research and development center, a higher education institution, etc.).

2.2.3. Regulatory practice related to security of supply

Security of supply projects

No barriers were mentioned by the interviewees during the interview.

Adequacy of the NRF relating to its support for security of supply investments

Generally, the NRF is considered adequate in supporting security of supply investments.

Given the changing Polish energy market, in which an increasing share of renewable energy is challenging more conventional energy producing facilities, TSO is implementing an large number of projects to increase the flexibility of the network and ensure system balancing.

Currently, in the PSE Network Investment Portfolio there are approx. 140 investment projects, of which particularly relevant for ensuring security of electricity supply include, among others, the following projects:

1. construction of the 400 kV Baczyna-Plewiska line;
2. extension of the 400/220/110 kV Miłosna station;
3. construction of a 400 kV line between the Warsaw agglomeration and Siedlce;
4. modernization of the 400/220/110 kV Wielopole station.

The projects are examples of how the regulatory regime works in practice on projects enhancing security of supply.

The respondents highlighted the following barriers:

- Construction law in the field of building permits for network investments;
- Environmental protection law regarding environmental decisions for network investments.

Possible improvement of the NRF

The interviewees mentioned potential improvements at national regulatory level should be made in defining at which level the TSO could be involved in energy storage and related storage services.

Adequacy of the NRF relating to its support for security of supply

The interviewees that the current NRF is in general adequate to support innovation with the exception of innovative investments involving energy storage lacking a clear definition of the role of the TSO in energy storage.

2.2.4. Illustrative specific projects

The following projects are examples of innovation and security of supply projects and thus they illustrate how the regulatory framework works in practise.

Market Management System

In the context of national or European electricity market, the most innovative element of the project is the (locational energy pricing) LMP's deployment.

NEDO project

The main goal of the project is to implement a system that will eliminate network overloads, caused by failures in the electricity power system.

The main innovative elements in the project consists of:

1. SPS system for elimination of network overloading;
2. hybrid battery energy storage system (BESS) which will consist of two leading technologies in the field of electricity storage (lead-acid and lithium-ion batteries);
3. integration of battery energy storage system (BESS) with wind farm;
4. checking of different functionalities SPS and battery energy storage system (BESS).

The following national regulatory barriers have been encountered in the project:

1. lack of clear and transparent conditions as to the integration of battery energy storage systems with renewable energy sources connected to the power system;
2. lack of clear and transparent conditions regarding the right to curtail the generation from wind farms and compensation mechanisms for this type of service.

2.3. Options for improvement

2.3.1. Options to improve regulatory practice

Since 2010 Poland have been in a fervent period of investments aiming at modernizing, expanding and upgrading its transmission grid. Many of these projects have been related to the enforcement of the level of security of supply in Europe, as a confirmation on how adequate the Polish NRF is in bolstering security of supply related investments.

Nonetheless, we have identified the following potential issues, which may limit the spectrum of benefits investing in innovative projects, either aiming or not at security of supply also, would bring about.

(i) Promoting innovative projects within the TYNDP

Despite the implementation of innovative projects could potentially be implied in the obligation of the TSO towards an efficient operational management of the grid able to create efficiency gains, there is no explicit mentioning of innovation in the Polish legislation.

Accordingly, some of the projects, which have been defined as innovative in Poland, have been included as part of the ten year network development plan. It follows that promoting innovative projects within the TYNDP may also be made mandatory in the legislation.

This approach could potentially be implemented by requiring the TSO to explain what alternatives have been weighed while developing the TYNDP plan including specifically a requirement to explain what innovative approaches have been considered. By so doing, insight into potential projects resulting in higher costs for the TSO, but having wider benefits to society, can be gained.

(ii) Introduction of cost benefit analysis in the evaluation process of projects as part of the project selection process

One barrier to efficient investment level of both innovative and security of supply projects is the lack of structured processes and explicit requirements for national cost-benefit analysis that would capture socio-economic gains that may not be beneficial to the TSO itself.

(iii) Potential investments should be compared to an optimal alternative solution

Further, investments are analysed independently, and not compared to a best alternative. This may cause sub-optimal investment decisions within both security of supply and innovation.

Some respondents have highlighted potential hurdles created by EU unbundling regime. Whether or not such hurdles are actually caused by the unbundling regime or not requires a careful analysis that falls outside the scope of this project. In the final report we point out that for some areas, a clarification of the boundaries of the activities that TSOs are allowed to undertake would be helpful. In other cases, the recently adopted Clean Energy Package (including e.g. the market test) provides a procedure to overcome such hurdles.

2.3.2. National law mechanism(s) for implementing options

As regards to option (i) ("Promoting innovative projects within the TYNDP"), we suggest that it might be implemented by way of amendment to Art. 16 of the Energy Law Act which would specify that the TSO – when submitting the draft TYNDP for the NRA's approval – will be obliged to explain what alternatives have been weighed while developing the draft TYNDP and in particular to explain what innovative approaches have been considered at the stage of development of the TYNDP.

Turning to option (ii) ("Introduction of cost benefit analysis in the evaluation process of projects as part of the project selection process") and (iii) ("Potential investments should be compared to an optimal alternative solution"), the legal mechanism for implementing these options would involve the modification of Art. 16 of the Energy Law Act which describes the methodology whereby projects for a detailed ten-year network development plan should be selected and may further impose an obligation on the TSO to explain – when submitting the draft TYNDP for the NRA's approval – how the investments included in the draft TYNDP were selected, including the relevant cost-benefit assessment of the proposed investments as well as justification of the proposed investments in terms of their significance for security of supply and innovation.

All the above improvements might be achieved via the regular legislative process as applicable in Poland in accordance with the Constitution of the Republic of Poland.²⁹

²⁹ The legislative process is specified in detail in the Constitution of the Republic of Poland and includes adoption of the bill by the Parliament (Sejm and Senate) as well as signature of the bill by the President of the Republic of Poland and promulgation. The power to initiate the legislative process (right of legislative initiative) is vested in: (a) the deputies to the Sejm (deputies' bills may be introduced by a Sejm committee or a group of at least 15 deputies), (b) the Senate (a resolution of the entire Chamber is necessary), (c) the President of the Republic, (d) the Council of Ministers, i.e. the government and (d) 100 000 citizens having the right to vote in elections to the Sejm. Bills are to be submitted, in writing, to the Marshal of the Sejm who orders their printing and delivery to the deputies. Every bill has to include an explanatory statement which explains, e.g. the need for and purpose of passing the bill, presents the expected social, economic, financial and legal consequences, points out the sources of finance, or includes the statement on compatibility of the bill with the EU law and the Marshal of the Sejm may return a bill to its sponsor if an attached explanatory statement does not fulfil the legal requirements. Bills are considered in three readings carried out within plenary sittings and committees and include i.a. (a) presentation of the bill, (b) debates over the bill itself and amendments/corrections thereto proposed by either sponsor of the bill or group of deputies and (c) voting. The bill adopted by the Sejm is passed to Senate, which may adopt the bill, propose amendments thereto or reject the bill in its entirety within the deadlines prescribed in the Constitution (most commonly within 30 days from submission of the bill). In case Senate makes no resolution on the bill, it is deemed that the bill was adopted by the Senate. If the Senate adopts a resolution on amendments to the bill passed by the Sejm or rejecting the bill in its entirety, the resolution is referred by the Marshal of the Sejm to the

2.3.3. Impact assessment

We have not encountered any specific examples of projects that have been cancelled due to the regulatory framework. It is also not clear to what extent potentially welfare enhancing projects have not been initiated due to inadequate incentives. Based on this reason, we do not expect that any of the suggested changes will result in considerable changes to investment levels.

committee, which previously dealt with the bill in Sejm. The committee, with the participation of the Senator-Rapporteur, debates over the Senate's position and presents another report with the proposal to approve the Senate's amendments entirely, in part, or to reject them. The Sejm may reject the Senate's amendments, as well as the motion to reject the bill by an absolute majority of votes (the number of affirmative votes exceeds the number of negative votes and abstentions) in the presence of at least half of the statutory number of Sejm deputies. If there is no absolute majority, the final text of the bill adopted by the Parliament will include the Senate's amendments. In the case of voting on the Senate's resolution on the rejection of the bill, the lack of majority means that the bill is abandoned. When the position of the Senate is considered, the Marshal of the Sejm refers the bill to the President of the Republic for signature. The President of the Republic of Poland signs the bill within 21 days following its submission (7 days in the case of urgent bills and draft Budgets) and orders its promulgation in the Journal of Laws (*"Dziennik Ustaw"*). The promulgation is necessary for the bill to become a law (to come into force) and, afterwards, a specified period of time has to elapse, so-called *vacatio legis*, i.e. the time necessary for citizens to get to know it and to get prepared for implementing it. The President has a right to refuse to sign the bill and can refer it back, with justification, to the Sejm for its reconsideration (so-called suspending veto), which means that the Sejm (but not the Senate) is to consider it again. There is no possibility of introducing any amendments at this stage. If the Sejm overrides a President's veto by a majority of 3/5 votes in the presence of at least half of the statutory number of deputies, the President has no other choice than to sign the bill and order its promulgation. In the case when there is no such a majority, the legislative process is finished and the bill is abandoned. The President, in the case of any legal doubts concerning the bill passed by the Parliament, may make an application to the Constitutional Tribunal concerning the conformity of the bill with the Constitution. Nevertheless, if the President exercises this right, he cannot use the suspending veto. Having considered the matter, the Tribunal decides whether the bill is constitutional. If the Tribunal states that the bill is consistent with the Constitution, the President is obliged to sign it. If the Tribunal finds the entire bill inconsistent with the Constitution, the President has to refuse to sign it.

3. GAS

3.1. Legal analysis of the NRF in Poland

3.1.1. Overview of the regulatory framework of Poland – legal rules

The Energy Law Act

The primary legislation governing the Legal Framework for natural gas in Poland is the Energy Law Act dated 10 April 1997 (hereinafter, the “**EL**”) as well as the secondary legislation issued thereunder. The foregoing legislation allocates the main duties and powers within the Legal Framework to the following authorities:

1. the Council of Ministers authorized to adopt the Energy Policy for Poland (for the time being it is the document “Energy Policy for Poland until 2030” adopted by the Council of Ministers on 9 November 2009) setting forth the main assumptions and directions for the development of the natural gas infrastructure³⁰;
2. the minister competent for energy affairs whose duties and powers include:
 - a) development of and public consultations on the draft Energy Policy for Poland as well as coordination of the implementation of that policy as adopted by the Council of Ministers³¹;
 - b) issuance of secondary legislation setting forth more detailed rules for: (i) operation of the natural gas network (currently included in the Regulation of the Minister of Economy of 2 July 2010 concerning detailed conditions for functioning of the natural gas system, hereinafter the “**System Regulation**”) ³², and (ii) calculation of tariffs for natural gas (currently included in the Regulation of the Minister of Energy of 28 June 2013 concerning detailed rules for calculation of tariffs and settlements for gas fuels hereinafter the “**Tariff Regulation**”; the Tariff Regulation applies to the TSO to the extent not otherwise regulated under the network code on rules regarding harmonised transmission tariff structures for gas (the TAR NC))³³;
 - c) supervision over security of supplies as well as functioning of the gas system (the minister competent for energy affairs is also responsible for preparation of the report presenting results from the monitoring of the security of energy supplies, including main investments in gas transmission network affecting internal security of supply as well as cross-border exchanges)³⁴;
 - d) acting as a national competent authority responsible for facilitating and coordinating the permit granting process for Projects of Common Interest within the meaning of Art. 8 Sec. 1 of the Regulation (EU) No 347/2013 of the European Parliament and of the Council of 17 April 2013 on guidelines for trans-European energy infrastructure and repealing Decision No 1364/2006/EC and amending Regulations (EC) No 713/2009, (EC) No 714/2009 and (EC) No 715/2009 (“**TEN-E Regulation**”) ³⁵.
1. the President of the Energy Regulatory Office (hereinafter, the “President of ERO”), acting as an independent national regulatory authority within the meaning of the Third Energy Package is obliged to exercise its regulatory powers in compliance with the EL and the Energy Policy for Poland, aiming at balancing the interests of undertakings and consumers³⁶; in this context the President of ERO is authorized to:
 - a) issue, amend and withdraw licences for transmission of natural gas as well as certify and appoint the transmission system operator as well as supervise its activities³⁷;
 - b) approve the transmission network code³⁸;
 - c) approve the detailed 10-year development plan for meeting current and future natural gas demand (“**TYNDP**”) ³⁹;
 - d) approve TSO’s tariffs for transmission of natural gas, which are to provide revenues required to finance operation and development of the transmission network⁴⁰.

³⁰ Art. 15a of the EL.

³¹ Art. 12 Sec. 2 point 1) of the EL.

³² Art. 9 Sec. 1 of the EL.

³³ Art. 46 Sec. 1 of the EL.

³⁴ Art. 12 Sec. 2 point 3) and Art. 15b Sec. 1-2 of the EL.

³⁵ Art. 15g of the 1997 Energy Law.

³⁶ Art. 21 Sec. 1 of the 1997 Energy Law.

³⁷ Art. 33 Sec. 1 in conj. with Art. 32 Sec. 1 point 3) as well as Art. 9h-9h² of the EL.

³⁸ Art. 9g Sec. 7 of the EL.

³⁹ Art. 16 Sec. 14 of the EL.

⁴⁰ Art. 47 Sec. 2 of the EL.

2. the Government's Plenipotentiary for Strategic Energy Infrastructure authorized to exercise rights arising from the State Treasury's shares in the TSO.

The abovementioned duties and powers should be exercised in compliance with the basic aims of the EL that include: creating conditions for sustainable development of the country, ensuring energy security, economical and rational use of fuels and energy, development of competition, counteracting the negative effects of natural monopolies, taking into account environmental protection requirements and obligations under the international agreements as well as balancing the interests of energy undertakings and consumers.

The EL sets up the licensing regime for the gas market in Poland and appoints the President of ERO as an independent regulator administering this regime⁴¹. Licensable activities include transmission, distribution, storage, liquefaction, supply and foreign trade in natural gas as well as regasification of LNG⁴². Each of the foregoing activities might be pursued upon separate license and subject to standard unbundling rules in compliance with the Third Package.⁴³ Although most of the energy activities might be carried out by multiple entities, the law in force provides for a monopoly in terms of gas transmission, which means that such activity might be pursued exclusively by one transmission system operator, which has the status of a joint-stock company with all shares held by the State Treasury of Poland⁴⁴. As a result of the ownership unbundling rules, the rights arising from the State Treasury's shares in the TSO are exercised by the Government's Plenipotentiary for Strategic Energy Infrastructure established as an authority separate from the Minister of Energy and other ministers exercising State Treasury's shares in companies being involved in production, distribution, supply and/or consumption of natural gas.

OGP Gaz-System S.A

The transmission system operator, OGP Gaz-System S.A., operates its own network covering more than 11,000 km of pipelines for transmission of high-methane and low-methane natural gas with diameter of the pipelines ranging from 100mm up to 1000mm; it also operates the Polish section of the Yamal-Europa gas pipeline which is owned by the company SGT EuRoPol Gaz S.A. (a joint venture company of PGNiG S.A. and Gazprom).

The TSO is obliged to carry out investments related to the transmission grid within the general TSO responsibilities for security of energy supply as well as efficiency, reliability and quality of gas transmission as well as the long-term capability of the transmission system to satisfy the legitimate demand for transmission of gaseous fuels as further described in Section 3.1.2 below. The list, timelines and overall budget of investments are set out in the TYNDP, which is subject to approval/consent of the President of ERO.

3.1.2. Specific legal rights and duties

OGP Gaz-System S.A ("GTS") is owner and operator of the national transmission network for gas in Poland. In this role, GTS has a number of statutory tasks to fulfil including the obligations to construct, repair and extend the network.

Transmission tasks

the EL provides that there may be only one entity appointed as the transmission system operator for the gas transmission networks located within the territory of Poland and such entity must operate in the form of a joint-stock company with all shares held by the State Treasury of Poland⁴⁵. According to the foregoing rule, there is only one gas transmission system operator appointed in Poland (company named OGP Gaz-System S.A., referred to hereafter as the "TSO") which is appointed to operate the following two natural gas transmission networks in Poland:

1. the natural gas transmission network owned by the TSO and operated by the TSO within the ownership unbundling framework; and
2. the Polish section of the Yamal-Europa gas pipeline owned by the company SGT EuRoPol Gaz S.A. (a joint venture of Russian Gazprom and Polish PGNiG S.A.) which transmits high-methane natural gas from the Belarus-Poland border up to the Poland-German border (with

⁴¹ Art. 33 Sec. 1 in conj. with Art. 32 Sec. 1 point 3) and Art. 23 Sec. 2 point 1) of the EL.

⁴² Art. 32 Sec. 1 of the EL.

⁴³ Art. 9h-9h² of the EL.

⁴⁴ Art. 9h Sec. 2 in conj. with Art. 9k of the EL.

⁴⁵ Art. 9h Sec. 2 in conj. with Art. 9k of the EL.

two interconnection points with the TSO's own transmission network at the territory of Poland). As regards the Yamal-Europa gas pipeline, the TSO operates the Polish section of the Yamal gas pipeline under the ISO model and exclusively in respect of the capacities which are not otherwise utilized under the prior long-term transmission agreements between SGT EuRoPol Gaz S.A. and, respectively, Gazprom export and PGNiG S.A.

The TSO is responsible for duties according to Art. 9c Sec. 1 of the EL:

1. security of gaseous fuel supply by assuring security of functioning of the transmission system and performance of the transmission contracts with the System Users;
2. the management of network operation in a coordinated and efficient manner, while maintaining the required reliability of gas fuel transmission and quality;
3. operation, maintenance and repairs of the network, installations and facilities of the transmission system, together with the interconnections with other gas systems in a manner that guarantees the reliability of the transmission system functioning;
4. assurance of the long-term capability of the transmission system to satisfy legitimate demand for transmission of gaseous fuels, as well as the expansion of the transmission system, and where applicable, expansion of interconnections with other gas systems;
5. cooperation with the interoperating system operators or other energy companies in order for the gas systems to ensure reliable and efficient operation of the respective gas systems and to coordinate their development, including cooperation within the ENTSOG;
6. dispatching capacities of the gas storage and LNG installations;
7. management of the flows of gaseous fuel and the maintenance of the quality parameters of such fuel in the transmission system and at the connections with interoperating systems;
8. provision of the services required for proper operation of the transmission system;
9. balancing of the system and management of congestion in the transmission system, as well as handling settlements with the Shippers, which arise from their imbalance;
10. providing information to the System Users and other system operators on the terms and conditions for the provision of transmission services, including the interoperation with interconnected gas systems;
11. holding periodic market screening exercises to assess the demand for new transmission infrastructure, with a view to using the results of such surveys in the definition of development plans or offering procedure of newly built and expanded physical entry points;
12. delivering gaseous fuel at the physical exit point from the transmission system and ensuring that such gaseous fuel conforms to the quality parameters, provided that the (contracted) capacity at the exit point has not been exceeded by the System User.

Ten-year network development plan

Within the general obligation to develop and expand the gas transmission network as well as interconnectors (Art. 9c Sec. 1 point 4 of the EL) as set out in point 4. above, the TSO is obliged under Art. 16 of the EL to prepare the detailed ten-year network development plan which is subject to approval/consent of the President of ERO and taken into account in the course of calculation and approval of the transmission tariff. The plan typically includes list, timelines and overall budget for investments undertaken to both modernize and develop the transmission networks operated by the TSO, however investments related directly to the Polish section of the Yamal-Europa pipeline are carried out by its owner (i.e. SGT EuRoPol Gaz S.A.) based on the agreement entered into between SGT EuRoPol Gaz S.A. and the TSO in accordance with Art. 9h Sec. 12 point 2 of the EL.

Transmission network code development

Pursuant to Art. 9g of the EL, the TSO is obliged to develop the transmission network code which provides for the detailed rules applicable to (a) operation, maintenance, repairs, development as well as interconnection to the Polish natural gas transmission network, (b) technical requirements for interconnected installations and networks, (c) security criteria for the operation of the gas network, (d) cooperation and flow of information among TSO, DSOs and other grid users, (e) quality parameters as well as settlement rules related to provision of the transmission services, (f) procedures and settlement rules applicable to the balancing market. Upon approval of the President of ERO, the transmission network code is binding upon both the TSO and the network users (including shippers, DSOs as well as end-users).

3.1.3. Mechanism for financing of investment projects

Tariffs

The TSO's investment projects are generally financed with revenues coming from the transmission tariffs set by the TSO which are subject to the prior approval of the President of ERO (according to Art. 45a Sec. 1 of the EL, the TSO is not allowed to provide services at different rates than those resulting from the tariff which was previously approved by the President of ERO). The President of ERO typically approves tariffs for the period of 1 year.

System of setting the tariffs

Tariffs for transmission services are generally developed based on the bottom-up approach with application of benchmarking in respect of operational costs of the TSO. In particular, (pursuant to Art. 45 Sec. 1 in conjunction with Art. 3 point 21 of the EL), the tariff should be set by the TSO in a manner that ensures:

- a) compensation for the justified costs of the regulated business activity and performance of statutory obligations imposed on the TSO, such costs to be determined by the TSO for the purpose of tariff calculation in a cost-effective manner and with due diligence, aimed at protecting the interests of customers;
- b) obtaining of a justified return on capital employed in the TSO's business activity, which constitutes the product of: (i) the regulatory asset base which corresponds to the net value of fixed assets employed in TSO's activities, less the non-repayable EU subsidies spent to develop the said fixed assets, and increased by the average annual level of working capital employed in the transmission activities (hereinafter the "RAB") and (ii) the WACC indicator calculated based on the WACC pre-tax formula specified by the President of ERO, such formula indicating the way in which companies should calculate individual parameters within that methodology: the structure of asset financing, cost of equity and cost of external capital).

Based on Art. 23 Sec. 2 point 3 of the EL, the President of ERO develops a methodology for the calculation of the WACC indicator and is further authorized to review and adjust the actual level of justified costs as well as the value of the RAB in a way that incentivises efficiency of the TSO's operations and ensures necessary financing for capital expenditures required to implement investment projects within the scope, timelines and budgets approved by the President of ERO under the TYNDP. Based on Art. 47 Sec. 2e of the EL and § 7 Sec. 3 of the Tariff Regulation, in the course of review and adjustment of the justified costs, the President of ERO may apply benchmarking methods. In order to further incentivise cost efficiency of the TSO's operations, the President of ERO may apply also the RPI-X model whereby the justified own costs of the TSO are capped at RPI minus the expected efficiency savings correction coefficient⁴⁶. In any case, the President of ERO approves the final transmission rates calculated as a quotient of: (a) respective justified costs and return on capital employed; and (b) the forecasted volume of services to be rendered by the TSO in a given year (which is also subject to review and adjustment by the President of ERO).

In accordance with §13 of the Tariff Regulation, the transmission tariff provides for two principal fees which are designed to socialize specific costs involved in transmission activities:

1. a fixed transmission fee which corresponds to 90% of the TSO's revenues and is designated to compensate for the fixed costs incurred by the TSO;
2. a variable transmission fee, which corresponds to 10% of the TSO's revenues and is designated to compensate for the TSO's variable costs and the part of its fixed costs which were not taken into account for the purpose of calculating of the fixed fee.

In general, the TSO's tariff rates do not depend on the quality of transmission services provided by TSO. On the other hand, the TSO is liable for any failure to meet the gas supply standards, including interruptions/reductions of gas supplies, reduction of pressure, failure to ensure natural gas qualities. The foregoing liability is enforced based on the tariff that provides for the algorithms applicable to calculation of the discounts (penalties) payable for each violation⁴⁷.

⁴⁶ § 9 Sec. 1 of the Tariff Regulation.

⁴⁷ § 40 of the Tariff Regulation.

As the tariffs are calculated and approved on *ex ante* basis (i.e. based on the forecasts of both justified costs and volume of services to be rendered by the TSO in given year), the actual revenues of the TSO may vary from the projection taken into account at the stage of tariff approval - depending on actual costs and volume of services rendered by TSO in given year. Polish law does not provide for specific *ex post* settlements or adjustments of the tariff revenues due to differences between forecasts and actual performance of the transmission services and investments. Besides, there is no regulation authorizing the President of ERO (or any other authority) to put caps on TSO's revenues.

Cross-border allocation of transmission capacity

Apart from the tariff revenues, certain projects related to the development of the gas transmission grid might be financed from EU funds (including Cohesion Fund and the Connecting Europe Facility) and/or benefit from cross-border cost allocation under the TEN-E Regulation. The foregoing financing measures refer in particular to the investments qualified as Projects of Common Interest under the TEN-E Regulation. Such financing is taken into account within the tariff procedures in the sense that the justified return on capital employed for the purpose of tariff calculation excludes non-refundable EU funds or funds reimbursed within the cross-border cost allocation. In practice, a number of the TSO's investment projects benefited from EU funds. Furthermore, the TSO pursues with certain investment projects (including gas interconnectors between Poland and Lithuania (also known as "GIPL"), Czech Republic (also known as "Stork II") and Denmark (also known as "Baltic Pipe")) which should benefit from the cross-border cost allocation under the TEN-E Regulation. The cross-border cost allocation mechanism involves different payment mechanisms (e.g. direct payments between TSOs from different countries or conditional guarantees between TSOs compensating the gap between (a) the minimum revenues of the TSOs approved by the regulator with respect to the transmission services rendered with given infrastructure and (b) the actual revenues generated from such activity).

3.1.4. Regulatory rules with respect to innovation

Specific duties of the TSO aimed at encouraging innovation

Polish law does not include statutory provision that would expressly require the TSO to apply innovation in its business activities. Despite that, certain measures encouraging the TSO to implement innovation are implicit in the obligations imposed on the TSO, such as: (a) general responsibility for operational management of the transmission grid in an efficient manner, ensuring the required reliability and quality of gas transmission services, as well as (b) obligation to develop the TYNDP which would ensure long-term efficiency of capital expenditures and costs incurred by the TSO⁴⁸.

Specific duties of the NRA aimed at encouraging innovation

Polish law does not include a statutory provision that would explicitly require the President of ERO to call for and/or support innovations in transmission services. Certain measures, which may indirectly encourage the President of ERO to promote innovation, are however implied in the general NRA's obligations to exercise its duties and powers with a view to ensuring efficiency of the TSO's operations and the long-term efficiency of capital expenditures and costs incurred by the TSO.

3.1.5. Regulatory rules with respect to security of supply

Specific duties of the TSO aiming at safeguarding security of supply

The TSO is obliged to safeguard security of supply within the general TSO responsibilities for security of energy supply, efficiency, reliability and quality of gas supply as well as the long-term capability of the transmission system to satisfy the legitimate demand for transmission of gaseous fuels as further described in section 3.1.2 above.

Instruments undertaken by the TSO in this context are:

1. development of the transmission network code which provides for the detailed rules applicable to: (a) operation, maintenance, repairs, development as well as interconnection to the Polish natural gas transmission network, (b) technical requirements for interconnected

⁴⁸ Art. 16 Sec. 10 of the EL.

- installations and networks, (c) security criteria for operation of the gas network, (d) cooperation and flow of information among the TSO, DSOs and other grid users, (e) quality parameters as well as settlement rules related to provision of the transmission services, and (f) procedures and settlements rules applicable to balancing market⁴⁹;
3. balancing of the system and congestion management⁵⁰;
4. development and enforcement of curtailment plans as further regulated in Art. 52-61 of the Act of 16 February 2007 on stocks of crude oil, petroleum products and natural gas, the principles of proceeding in circumstances of a threat to the fuel security of the State and disruption on the petroleum market.

Specific duties of the NRA aiming at safeguarding security of supply

When exercising the duties and powers specified in section 3.1.1 and 3.1.2 above (in particular in the course of appointment of the TSO as well as review and approval of both the TYNDP and transmission tariffs), the President of ERO is bound by statutory requirements to ensure security of supply, reliability and efficiency of the gas network as well as to comply with the Energy Policy for Poland that describes the main investments related to security of supply⁵¹. Furthermore, the President of ERO is obliged to: (a) supervise and monitor performance of the TSO's statutory obligations, including obligations specified in section 3.1.2 above; and (b) monitor general functioning of the gas system in terms of security of supply.⁵²

3.2. Regulatory practice

3.2.1. Overview over regulatory practice in Poland

Main regulatory barriers

The interviewees deem that the NRF is, in general terms, adequate to support current innovation and security of supply in Poland.

Limitations on how the current framework will be able to accommodate future innovative projects have been drawn attention to the need of a more flexible framework able to allow investments embracing power-to-gas solutions. The interviewees affirmed that in the past a few power-to-gas investments were initiated despite set in hold. With the envisioned increase of offshore wind energy production in Poland in the upcoming future, power-to-gas projects are expected to start off again.

Bio-gas investments are already a reality in Poland despite as off-grids solutions as of now.

With the advent of new IT system upgrade in the company, digitalisation of operations is going hand in hand with new IT developments. In line with the new REGULATION (EU) 2017/1938, the TSO has been working on checking whether the provisions currently in place might limit the synergy between TSO, DSOs and LNG operators. Offering of virtual gas pipeline solutions may extend the capacity of the gas system and potentially extent the TSO's business activities.

Replacement of solid fuels with gas for those areas not covered by gas could be seen as an innovative project for Poland.

Possible improvement of the NRF

At the moment, fostering innovative technology feasible solutions embracing the electricity energy harvesting from waste heat or cold should be seen of pivotal importance in the development of the gas industry in Poland. Lack of a clear definition in the current NRF and European energy directive in defining the ownership of the facilities allowing renewable energy production, as well as the type of services the TSO may be allowed to offer in the chain due to unbundling obligations, inhibits the financing of innovative projects.

⁴⁹ Art. 9g of the EL.

⁵⁰ Art. 9c Sec. 2 point 9) of the EL.

⁵¹ Art. of 23 Sec. 1 the EL.

⁵² Art. of 23 Sec. 2 point 2), 6)-6b), 20f) and 20g) of the EL.

3.2.2. Regulatory practice related to innovation

Innovative projects

The TSO underlines that there is no incentive for such activities. All costs are included in the regulatory asset base.

The TSO confirms that most of the projects could be defined as “standard transmission development” projects covering construction, maintenance or overhauling of pipelines, compression stations and LNG terminals upgrades and the likes. A very marginal set of projects may be regarded as “innovative”; among these, IT solutions for gas trading are the most representative as to applied innovation to the Polish gas system.

The interviewees, however, identified the following general barriers in innovative ongoing power-to-gas projects:

- a) waste cold recovery from the regasification process;
- b) waste heat recovery from, among others, gas compressors;
- c) energy recovery at gas reduction stations.

The barriers which may hinder the TSO from innovative investment lays on the boundaries of ownership of gas-based solution ever more part of energy producing systems. In particular, the interviewees underline how recovering waste energy from regasification and liquefaction processes to enable electricity production, is outside the range of activities the TSO is allowed to be involved into.

Adequacy of the NRF relating to its support for innovative investments

The interviewees underlined that even though the current NRF is adequate to support current innovation projects, amendments in the NRF should be made to accommodate future innovative projects looking at developing energy systems able to integrate gas and electricity needs.

3.2.3. Regulatory practice related to security of supply

Security of supply projects

The TSO confirms that the regulatory framework in force supports SoS adequately. The many large infrastructure projects ongoing confirms this view, and show how well the regulatory framework supports projects that enhance security of supply.

Adequacy of the NRF relating to its support for security of supply investments

Generally, the NRF is considered adequate in supporting security of supply investments. The good synergy between the European legislation and Polish legislation supports the implementation of SoS projects in Poland.

3.2.4. Illustrative specific projects

There are many projects that illustrate how the regulatory practice supports investments in infrastructure that enhances security of supply. The projects are quite different by nature, but all illustrates the focus put on security of supply.

Capacity extension of Świnoujście LNG terminal

Polskie LNG, a subsidiary of the TSO GAZ-SYSTEM, plans to expanding the terminal's capacity from 5 billion cubic meters to 7.5 billion cubic meters.

Poland – Slovakia interconnection

The objective of the project is the construction of new, cross-border gas pipeline, that will connect the natural gas transmission systems of Poland and Slovakia. The parties of the project are GAZ-SYSTEM S.A. and Eustream a.s - Polish and Slovak transmission system operators. The project is a PCI project.

The section of Poland-Slovakia gas pipeline located on Polish territory (The Strachocina Gas Pipeline - Poland's border) along with The Strachocina gas compressor, are included in the Poland-Slovakia interconnection (Poland-Slovakia interconnector) with funds from The Connecting Europe Facility (CEF) - EU funding instrument.
Basic parameters of the project (on Polish territory):

- high pressure gas pipeline,
- diameter: 1000 mm,
- working pressure: 8.4 MPa,
- length: approx. 59 km.

Poland – Czech Republic interconnection "Stork II"

GAZ-SYSTEM S.A. together with the Czech transmission system operator - NET4GAS s.r.o. are implementing a project that consists in increasing the transmission capacity of the Polish-Czech interconnector. This action is a part of the second stage of the project implementation. The purpose of the second stage is to increase the transmission capacity between Poland and the Czech Republic through modernization and construction of transmission systems on both sides of the border. The implementation of the second stage will allow creating a high-capacity transmission system, which ultimately will provide the possibility of gas transmission to Poland, as well as the possibility of transmission in the reverse direction, i.e. from Poland to the Czech Republic. The project is a PCI project.

The main objective of this task is to carry out preparatory work for transmission system elements on both sides of the border. It includes in particular the preparation of a design concerning the land use permit for the Tvrdonice - Libhost (CZ) gas pipeline, the preparation of an environmental impact assessment, as well as obtaining the authorisation for the location.

Baltic Pipe Project

The Baltic Pipe Project is a strategic gas infrastructure project with the goal of creating a new gas supply corridor in the European market. The Baltic Pipe Project will allow transport of gas from Norway to the Danish and Polish markets, as well as to end-users in neighbouring countries. At the same time, the Baltic Pipe Project will enable the supply of gas from Poland to the Danish and Swedish markets. Hence, the project allows Denmark and Sweden access to the LNG market via the Polish LNG terminal in Świnoujście.

The project is being developed in collaboration between the Danish gas and electricity transmission system operator Energinet and the Polish gas transmission system operator GAZ-SYSTEM.

Some respondents have highlighted potential hurdles created by EU unbundling regime. Whether or not such hurdles are actually caused by the unbundling regime or not requires a careful analysis that falls outside the scope of this project. In the final report we point out that for some areas, a clarification of the boundaries of the activities that TSOs are allowed to undertake would be helpful. In other cases, the recently adopted Clean Energy Package (including e.g. the market test) provides a procedure to overcome such hurdles. The Baltic Pipe Project illustrates how the regulatory practice works in practice when it comes to projects that enhance security of supply.

Gas Interconnector Poland Lithuania (known as GIPL)

The aim of the project is the construction of a new cross-border gas pipeline, which will connect the natural gas transmission systems of Poland and Lithuania. The Parties to the project are GAZ-SYSTEM S.A. and Amber Grid AB – the Lithuanian transmission system operator. The project is presently on the pre-investment stage, and is a PCI project.

The North-South Gas Corridor

The North-South Gas Corridor connects the LNG Terminal in Świnoujście with the Baltic Pipe, through central Poland, the Czech Republic, Slovakia and Hungary with the LNG terminal in Croatia. The project is a PCI project.

The Corridor is comprised of many bi-directional inter-system gas connections and domestic gas pipelines that are already in place, or are still on various stages of the planning or construction process.

Benefits include:

- increasing the integration of regional gas markets,
- increasing security of supplies,
- enabling access to new sources of supply (LNG, Norway) for Eastern Europe,
- coordination of regional infrastructure projects,

- the harmonisation/unification of principles that are valid and binding on the market,
- enabling the implementation of regional prevention and emergency procedures in crises situations.

3.3. Options for improvement

Poland is investing heavily in security of supply related projects. Projects vary from large interconnector projects (e.g. GIPL, Baltic Pipe, Poland-Slovakia), LNG terminal and terminal extensions, to within-country enhancement of the national gas grid. The relative high number of ongoing infrastructure projects is a clear sign that no regulatory barrier in investments on security of supply enhancing projects hold the TSO off from investing in grid development.

3.3.1. Options to improve regulatory practice

(i) Promoting innovative projects within the TYNDP

Despite the implementation of innovative projects could potentially be implied in the obligation of the TSO towards an efficient operational management of the grid able to create efficiency gains, there is no explicit mentioning of innovation in the Polish legislation. Accordingly, some of the projects, which have been defined as innovative in Poland, have been included as part of the ten year network development plan. It follows that promoting innovative projects within the TYNDP may also be made mandatory in the legislation.

This approach could potentially be implemented by requiring the TSO to explain what alternatives have been weighed while developing the TYNDP plan including specifically a requirement to explain what innovative approaches have been considered. By so doing, insight into potential projects resulting in higher costs for the TSO, but having wider benefits to society, can be gained.

(ii) Introduction of cost benefit analysis in the evaluation process of projects as part of the project selection process

One barrier to efficient investment level of both innovative and security of supply projects is the lack of structured processes and explicit requirements for national cost-benefit analysis that would capture socio-economic gains that may not be beneficial to the TSO itself.

(iii) Potential investments should be compared to an optimal alternative solution.

Further, investments are analysed independently, and not compared to a best alternative. This may cause sub-optimal investment decisions within both security of supply and innovation.

Some respondents have highlighted potential hurdles created by EU unbundling regime. Whether or not such hurdles are actually caused by the unbundling regime or not requires a careful analysis that falls outside the scope of this project. In the final report we point out that for some areas, a clarification of the boundaries of the activities that TSOs are allowed to undertake would be helpful. In other cases, the recently adopted Clean Energy Package (including e.g. the market test) provides a procedure to overcome such hurdles.

3.3.2. National law mechanism(s) for implementing options

As regards to option (i) ("Promoting innovative projects within the TYNDP"), we suggest that it might be implemented by way of amendment to Art. 16 of the Energy Law Act which would specify that the TSO – when submitting the draft TYNDP for the NRA's approval – will be obliged to explain what alternatives have been weighed while developing the draft TYNDP and in particular to explain what innovative approaches have been considered at the stage of development of the TYNDP.

Turning to option (ii) ("Introduction of cost benefit analysis in the evaluation process of projects as part of the project selection process") and (iii) ("Potential investments should be compared to an optimal alternative solution"), the legal mechanism for implementing these options would involve the modification of Art. 16 of the Energy Law Act which describes the methodology whereby projects for a detailed ten-year network development plan should be selected and may further impose an obligation on the TSO to explain – when submitting the draft TYNDP for the NRA's approval – how the investments included in the draft TYNDP were selected, including the

relevant cost-benefit assessment of the proposed investments as well as justification of the proposed investments in terms of their significance for security of supply and innovation. All the above improvements might be achieved via the regular legislative process as applicable in Poland in accordance with the Constitution of the Republic of Poland.⁵³

3.3.3. Impact assessment

We have not encountered any specific examples of projects that have been cancelled due to the regulatory framework. It is also not clear to what extent potentially welfare enhancing projects have not been initiated due to inadequate incentives. Based on this reason, we do not expect that any of the suggested changes will result in considerable changes to investment levels.

⁵³ The legislative process is specified in detail in the Constitution of the Republic of Poland and includes adoption of the bill by the Parliament (Sejm and Senate) as well as signature of the bill by the President of the Republic of Poland and promulgation. The power to initiate the legislative process (right of legislative initiative) is vested in: (a) the deputies to the Sejm (deputies' bills may be introduced by a Sejm committee or a group of at least 15 deputies), (b) the Senate (a resolution of the entire Chamber is necessary), (c) the President of the Republic, (d) the Council of Ministers, i.e. the government and (d) 100 000 citizens having the right to vote in elections to the Sejm. Bills are to be submitted, in writing, to the Marshal of the Sejm who orders their printing and delivery to the deputies. Every bill has to include an explanatory statement which explains, e.g. the need for and purpose of passing the bill, presents the expected social, economic, financial and legal consequences, points out the sources of finance, or includes the statement on compatibility of the bill with the EU law and the Marshal of the Sejm may return a bill to its sponsor if an attached explanatory statement does not fulfil the legal requirements. Bills are considered in three readings carried out within plenary sittings and committees and include i.a. (a) presentation of the bill, (b) debates over the bill itself and amendments/corrections thereto proposed by either sponsor of the bill or group of deputies and (c) voting. The bill adopted by the Sejm is passed to Senate, which may adopt the bill, propose amendments thereto or reject the bill in its entirety within the deadlines prescribed in the Constitution (most commonly within 30 days from submission of the bill). In case Senate makes no resolution on the bill, it is deemed that the bill was adopted by the Senate. If the Senate adopts a resolution on amendments to the bill passed by the Sejm or rejecting the bill in its entirety, the resolution is referred by the Marshal of the Sejm to the committee, which previously dealt with the bill in Sejm. The committee, with the participation of the Senator-Rapporteur, debates over the Senate's position and presents another report with the proposal to approve the Senate's amendments entirely, in part, or to reject them. The Sejm may reject the Senate's amendments, as well as the motion to reject the bill by an absolute majority of votes (the number of affirmative votes exceeds the number of negative votes and abstentions) in the presence of at least half of the statutory number of Sejm deputies. If there is no absolute majority, the final text of the bill adopted by the Parliament will include the Senate's amendments. In the case of voting on the Senate's resolution on the rejection of the bill, the lack of majority means that the bill is abandoned. When the position of the Senate is considered, the Marshal of the Sejm refers the bill to the President of the Republic for signature. The President of the Republic of Poland signs the bill within 21 days following its submission (7 days in the case of urgent bills and draft Budgets) and orders its promulgation in the Journal of Laws (*"Dziennik Ustaw"*). The promulgation is necessary for the bill to become a law (to come into force) and, afterwards, a specified period of time has to elapse, so-called *vacatio legis*, i.e. the time necessary for citizens to get to know it and to get prepared for implementing it. The President has a right to refuse to sign the bill and can refer it back, with justification, to the Sejm for its reconsideration (so-called suspending veto), which means that the Sejm (but not the Senate) is to consider it again. There is no possibility of introducing any amendments at this stage. If the Sejm overrides a President's veto by a majority of 3/5 votes in the presence of at least half of the statutory number of deputies, the President has no other choice than to sign the bill and order its promulgation. In the case when there is no such a majority, the legislative process is finished and the bill is abandoned. The President, in the case of any legal doubts concerning the bill passed by the Parliament, may make an application to the Constitutional Tribunal concerning the conformity of the bill with the Constitution. Nevertheless, if the President exercises this right, he cannot use the suspending veto. Having considered the matter, the Tribunal decides whether the bill is constitutional. If the Tribunal states that the bill is consistent with the Constitution, the President is obliged to sign it. If the Tribunal finds the entire bill inconsistent with the Constitution, the President has to refuse to sign it.

ANNEX I: TYPOLOGICAL INVESTMENTS – ELECTRICITY

Generally, the term typological investment relates to technical solutions that TSOs can adopt to provide the transmission capacities needed to cover the transmission demand of grid users. Thus, a typological investment is meant to be a type of solution that can be implemented, in principle, by any TSO in situations in which these solutions are appropriate to provide the desired benefit. Hence, typological investments are not specific to a concrete location or a particular TSO. In the following, we have listed a selection of typological investments for the electricity transmission sector, that are differentiated in 7 categories that can be considered innovative as compared to conventional solutions. For each of these categories we have provided a number of examples of solutions, based on our existing knowledge, a literature review and interviews. The list might not be completely comprehensive, but should give an idea of our understanding of the different types of typological investments, we are interested in.

Category	Examples of solutions
New transmission lines based on innovative technology or change of technology of existing lines	<ul style="list-style-type: none"> • New HVDC lines (→allow to control the power flow; less expansive for long distance transport; undergrounding less complex); • Replacement of HVAC by HVDC lines (→less complex and less expensive; more compact design); • Underground cables or GIL (→ more expensive than OHL but can help improving public acceptance and accelerate the authorisation process); • Design of overhead line poles (→can help improving public acceptance and accelerate the authorisation process); • Replacement of conventional overhead line conductors by high-temperature conductors (→more expensive than conventional ones but can allow to provide additional capacity at a lower cost level and more quickly than by building completely new lines).
Introduction of dynamic capacity rating with the aim of utilising existing transmission lines or transformers at higher levels	Spectrum of technological options ranging from a differentiation of rating levels according to fixed time intervals (e.g. seasonal or time-of-day) down to online monitoring of equipment temperature and adaptation of capacity rating in real-time operation.
Installation of power flow control components in order to better adapt power flow patterns to capacities and topology of the existing grid.	<ul style="list-style-type: none"> • Phase-shifting transformers; • Semiconductor-based FACTS elements (including HVDC converters).
Investment into components contributing to ancillary services provision (reactive power / voltage control, short-circuit power, momentary power reserves and black-start capability)	<ul style="list-style-type: none"> • Purely phase-shifting generators (→offer operational flexibility and can serve to improve cost efficiency); • FACTS elements (→ see above).
New or extended power system control and automation technology with the aim to lower the risk of disturbances threatening security of supply	<ul style="list-style-type: none"> • Improvements in observability and controllability based on conventional sensor and actor devices; • Wide-area measurement systems (aiming at synchronously measuring power phasor angles at the grid nodes to improve observability); • Real-time dynamic security assessment tools (aiming at observing stability phenomena beyond static voltage/current measurements).

Category	Examples of solutions
Partial automation of system operation processes aiming at better utilisation of existing grid capacities	Automatic switching of network devices (in connection with adaptive protection schemes) or of generation-side or demand-side flexibilities in case of grid component outages in order to reduce the demand for (n-1) capacity reserves.
Improvement of approaches to curative congestion management providing the possibility to operate systems closer to their technical limits and/or to improve security of supply	<ul style="list-style-type: none">• Generation-side flexibilities (especially renewables);• Demand-side flexibilities (DSM/DR);• Storage components; and• Technologies coupling the electricity sector with other sectors (gas, heat, traffic).

ANNEX II: TYPOLOGICAL INVESTMENTS – GAS

Typological investments are meant to be those type of investments whose aim is to promote innovation in the gas transmission systems while ensuring or enhancing the level of security of supply of a region. Hence, by definition, they can be implemented independent of a specific TSO and location.

In the following table, we offer a resume of the typological investments for the gas transmission system we have deemed as innovative compared to “conventional” solutions.

The investments are broken down into four categories each accompanied by examples that emphasise their importance and impact on the gas system.

Category	Examples of solutions
Increased need for flexibility for market development and security of supply.	<ul style="list-style-type: none">• (Power-to-gas) Usage of excess pipeline capacity as “energy” storage of excess wind or solar energy by utilizing electrolysis (an efficient utilization of the excess of electricity produced by non-programmable sources of energy);• Increase withdrawal and injection capacity in storages by incentivising investments supporting flexibility (support of gas market liquidity and security of supply level);• Allowance of higher pressure in selected pipeline/routes (increase of flexibility of the supply side).
Incentivise and facilitate upgrade of biogas to the transmission system.	<ul style="list-style-type: none">• Investments in upgrade of biogas to transmission system (support of gas market liquidity and security of supply).
Digitalisation of operations, through e.g. drone inspections and artificial intelligence (AI), resulting in a safer and cost-efficient operation.	<ul style="list-style-type: none">• Drone inspections and AI in combination with modern SCADA systems can serve as input to reliability based operation and maintenance (lower maintenance cost and reduction of unforeseen/unplanned shutdowns).
In order to support security of supply and add liquidity to the gas market, there is a need to build interconnectors in Europe.	<ul style="list-style-type: none">• More reverse flow systems could be considered to increase flexibility in the supply routes (reduction of dependency and power of trading of the large gas suppliers);• Enhancement of available gas supply in situation of supply crisis;• possibility of arbitrage a price convergence between markets to support the development of the internal market.

ANNEX III: POTENTIAL REGULATORY BARRIERS FOR PROJECTS

Regardless of the character of a project (e.g. projects enhancing security of supply or applying innovative technologies, which this questionnaire is focussing on) there might be potential regulatory barriers for implementing projects in general but maybe also barriers for special kind of projects. To give you an impression what kind of barriers we have in mind, we have listed some examples of such barriers in the following. It should be noted that there might be different or even more or less barriers in the regulatory framework of your country.

Type	Description/Explanation
Higher TSO CAPEX but lower expected OPEX within the TSO	the investment upfront is more costly, but has a potential of lowering the operational costs in the future. However, because of its innovative and more risky character the lower OPEX is not guaranteed. If not allowed to put the costs in case of a failure in the tariffs, TSO would not invest in innovative solution.
Higher TSO CAPEX, but benefits go to the wider society, instead of the TSO	This is a situation where higher investment, including in new technologies, is needed on the part of a TSO but benefits in terms of RES integration, RES curtailment or CO2 avoidance benefit other players in the society, while the TSO is only faced with the cost increase. Projects in regulatory frameworks, which do not distribute adequately the benefits to the TSO that bears the costs and takes the risk, are less likely to happen. This could also apply to cross-border investments involving several TSOs.
Investments in smart grid elements /technology aimed at replacing planned grid investments	Investments in smart grids and other smart elements that actually reduce the need of physical construction of lines for example due to a better interactive/intelligent grid management of balancing tools (battery storage) may provide a reduction in the regulated asset base, however with a slight increase of tariffs, might not be realised.
Investments in security of supply – projects without commercial benefits	Projects that ensure security of supply will in some cases never bring enough commercial benefits such as a pipeline would be going to be used only in case of emergency. If the security of supply (e.g. diversification of the sources for gas) is not put into tariffs, a TSO is most likely not willing to invest.
Lower TSO TOTEX but shift in the CAPEX/OPEX ratio	In some member states CAPEX and OPEX are treated differently in the regulatory regimes. Depending on the incentives set by doing so, technical solutions/projects with higher CAPEX might be preferred by the TSOs even if they result in higher total costs.

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