



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

Country Report - Slovakia



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Country Report - Slovakia

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## **EXECUTIVE SUMMARY**

### **Assessment of the NRF and the regulatory practice of the electricity sector in Slovakia**

#### **The electricity NRF in Slovakia**

The general regulatory principle in the electricity transmission sector is rate-of-return. In the Slovakian electricity transmission sector there are to the best of our knowledge no duties for the TSO and the NRA aimed at encouraging innovation. The NRA has the duty to approve the NDP, investment plans and price regulation. Furthermore, the NRA can suggest changes in scope, which could encourage innovation and modernisation. Also, tariffs incentivise innovation and modernisation.

The TSO is responsible for long term planning of transmission system development to provide adequate development of infrastructure and ensure reliability within Slovakia and towards foreign countries. The TSO prepares and consults on the NDP annually and submits the NDP to the NRA and the responsible Ministry. Also, the TSO prepares an investment plan for 3 years with proposed prices for the transmission system. The TSO notifies the NRA annually of actual investments and can seek price changes within the regulatory period. Thus, the NRA enjoys wide powers through the approval of the NDP, the investment plan and pricing.

#### **The regulatory practice in the electricity sector in Slovakia**

We have not received any feedback to our questionnaires and requests from the electricity sector. Therefore, a description and analysis of the regulatory practice cannot be given.

#### **Options for improvement**

Due to the lack of response, we could not identify any improvement options.

### **Assessment of the NRF and the regulatory practice of gas sector in Slovakia**

#### **The gas NRF in Slovakia**

The general regulatory principle in the gas transmission sector can be described as price cap regulation. The price cap in Slovakia is calculated solely by benchmarking against transmission tariffs in other EU Member States for the previous 4 years. Neither the TSO's costs nor a reasonable rate of return is taken into account. Furthermore, due to social and political reasons, the NRA's focus is said to be on keeping prices low.

In the Slovakian gas transmission sector, there are to the best of our knowledge no explicit duties for the TSO aimed at encouraging innovation. Also, the NRA does not have explicit statutory power to encourage innovation, but the NRA has broad powers to approve innovative projects in the development plan.

#### **The regulatory practice in the gas sector in Slovakia**

Please note that we received only limited response from the gas sector. Therefore, the analysis of the regulatory practise might not cover views of all relevant stakeholders.

According to the interviewees we have spoken to, there are no large obstacles in the NRF and investments are sufficiently refunded. Rather than naming improvement needs, interviewees underline that regulation should be stable and not constantly be changed.

In general, the interviewees regard any of their projects that are in line with the EU goals (market integration, renewable and sustainable energy provision etc.) as innovative. In the interviewees' view, the NRF is generally adequate to support these projects. Moreover, a chain of measures to increase efficiency and reduce CO<sub>2</sub> (e.g. more efficient compressors) are planned and carried out, which are part of a long-term operating philosophy that could be interpreted as a reaction to the NRA's focus on keeping prices low.

The regulation regarding security of supply is seen as adequate to generally guarantee sustainable continuity of security of supply. Interviewees state to do several projects that enhance security of supply by the diversification of gas sources, increasing system flexibility etc.

All related measures have been implemented within the regulatory framework in force at the time of implementation, so the interviewees did not name any improvement needs.

### **Options for improvement**

Even though interviewees did not name any improvement needs and state that most of the today applied projects are regarded as being innovative, it could be considered useful to increase support for innovative projects to ensure the application of innovative solutions also in the long term. Even when these solutions do not directly reduce the TSO's costs but have wider benefits. This could be done by adding a statutory reference to innovation.

We have not encountered any specific examples of projects that have been cancelled due to the regulatory framework. For this reason, we do not expect that any of the suggested changes will result in considerable changes to investment levels. Yet, if the perceived risk of innovative projects is lowered. But the long-term strategic perspective on innovation mentioned in the improvement option necessitates efforts and coordination between the TSO and the NRA regarding the design of this long-term perspective.



## 1. INTRODUCTION

The present Country Report is a deliverable of the study “Do current regulatory frameworks in the 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 analyses. It is divided into two main sections, Section 2 which is related to electricity, and Section 3 which is related 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 Slovakia, 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 Slovakia. 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 the 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 Slovakia

#### 2.1.1. Overview of the regulatory framework of Slovakia – legal rules

For the purposes of the Legal Framework in Slovakia (“SK”), “transmission” is defined as interconnected ultra-high and very-high voltage electricity lines which in Slovak conditions means the lines of 440 kV, 220 kV and few 110 kV lines (mostly single-purpose lines connecting large electricity customers, a vestige from the period prior to the transposition of the 2<sup>nd</sup> EU legislative package).

#### Legal Framework in SK:

The principal legal regulation defining the Legal Framework is Act No. 251/2012 Coll., on Energy Sector and on Amendment and Supplementation of Certain Acts (the “**AoE**”) effective from 1 September 2012, adopted in order to transpose Directive 2009/72/EU of the European Parliament and of the Council concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC (the “**EU DoIME**”). Powers of the national regulatory office – Regulatory Office for Network Industries (the “**RONI**”) and framework conditions of regulation of the Legal Framework are governed by Act No. 250/2012 Coll., on Regulation in Network Industries, as amended (the “**AoR**”), effective also from 1 September 2012. Certain (below-specified) powers in the area of the Legal Framework are also held by the Ministry of Economy of the Slovak Republic (the “**MoE**”) as a central public authority and energy policy guarantor. Roles of the RONI and MoE in the area of the Legal Framework are as follows:

#### The MoE:

- ensures the monitoring of compliance with security of electricity and gas supplies<sup>1</sup>;
- takes measures aimed at safeguarding security of electricity supplies<sup>2</sup>;
- determines the scope of criteria of technical safety of the system and network<sup>3</sup> by means of an implementing regulation, currently being Decree No. 346/2012 Coll., on Prerequisites of Application for Granting Prior Consent;
- decides on the issuance of a certificate for the construction of an energy facility (subject to compliance of an investment plan with the energy policy of the Slovak Republic) – it covers all cases of construction, reconstruction or modernization of transmission system facilities<sup>4</sup>;
- imposes the obligation on the transmission system operator (the “**TSO**”) or other electricity network operators to introduce technologies that will provide for improvement of the energy efficiency of the system or decrease in electricity consumption and take measures aimed at preparation of construction or construction of new electricity facilities; for such purposes, the MoE may also provide incentives within the framework of the State aid rules<sup>5</sup>; the supplier of the technology that shall ensure improvement of the control of the system energy efficiency or reduction of electricity consumption and the supplier ensuring the preparation of construction and construction of new electricity facilities for which economic incentives are provided, shall be selected based on a tender organized by the RONI<sup>6</sup>.

#### The RONI:

- ensures material and price regulation in the energy sector based on the transparency and non-discrimination principle by providing for availability of goods and related regulated activities at reasonable prices and in specified quality<sup>7</sup>, grants permissions for pursuing business in the energy sector<sup>8</sup>, approves prices and tariffs for electricity transmission through individual pricing decisions<sup>9</sup>, while providing for details of the price

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<sup>1</sup> Section 88 (2)(c) of the AoE.

<sup>2</sup> Section 88 (2)(d) of the AoE.

<sup>3</sup> Section 88 (2)(e) of the AoE.

<sup>4</sup> Section 12 of the AoE.

<sup>5</sup> Section 25 of the AoE.

<sup>6</sup> Section 9 (1) (j) of the AoR.

<sup>7</sup> Section 3 (1) of the AoR.

<sup>8</sup> Section 4 of the AoE.

<sup>9</sup> Section 11, 12 and 14 of the AoR.

- regulation in implementing regulations; currently, it concerns Decree No. 18/2017 Coll., establishing a price regulation in the electricity sector (the “**RONI DoRE**”);
- carries out TSO certification in terms of the assessment of the compliance with requirements of the 3<sup>rd</sup> EU legislative package, while applying the principle of ownership unbundling of the TSO from other activities in the energy sector<sup>10</sup>.

The AoE defines basic conditions for pursuing business in the energy sector in the market in SK. Permissions (licences) are granted by the RONI, specifically, for the activities of electricity generation, transmission, distribution and supply, as well as for the activity of an operator of a short-term electricity market, who, in addition to the organization of a short-term electricity market, operates in the market also as a market operator. As regards the electricity transmission, in SK’s conditions, the full-value principle of ownership unbundling of the TSO from other activities in the energy sector<sup>11</sup> is applied. The electricity transmission activity is performed in SK by a single entity only, specifically, by Slovenská elektrizačná prenosová sústava, a.s. (“**SEPS**”)<sup>12</sup>, while the permission for such activity may only be granted for a single entity and it is valid for the entire territory of SK<sup>13</sup>. SEPS is a 100 % subsidiary of the State, while shareholder rights are exercised by the Ministry of Finance of the Slovak Republic (in order to apply Article 9 (7) of the DoIME). SEPS is, at the same time, the sole shareholder of the short-term electricity market operator OKTE, a.s.

In order to obtain the required licence and permissions, the TSO must comply with the following conditions<sup>14</sup>:

- a) location of the seat, enterprise or branch of a legal person in a designated territory;
- b) professional competence to perform the required activities;
- c) proving technical prerequisites for the performance of the activities requested to be covered by the permission; in the case of transmission, proving technical prerequisites necessary for an alignment of the system deviation;
- d) designation of a responsible representative;
- e) integrity of this legal person or integrity of the statutory authority or members of the statutory authority.

In terms of the Legal Framework, the area of price regulation of transmission tariffs, which is ensured by the RONI, is important. Pursuant to the AoR, price regulation may only be performed in one of the following ways, specifically, by (i) direct determination of a fixed price from which no deviation is allowed, (ii) direct determination of the maximum price which may not be exceeded, (iii) determination of the fixed price calculation method, (iv) determination of the maximum price calculation method, (v) determination of the scope of economically substantiated costs which may be included in the price and of the amount of a reasonable profit, (vi) determination of the price by applying market measures, such as, auctions<sup>15</sup>.

The maximum price or the fixed price may also be determined by comparing (a) the calculation method of the maximum price for access to the transmission system and electricity transmission, (b) the calculation method of the maximum price for access to the transmission system and electricity transmission, (c) particular components forming the structure of the price for regulated activities with components forming the structure of the price of identical regulated activities in the Slovak Republic or Member States, or (d) price for the regulated activity with the price for an identical regulated activity in the Slovak Republic or Member States<sup>16</sup>. The price regulation method must take into account economically substantiated costs, economic efficiency and reasonable profit including the scope of investments that may be included in the price or economically substantiated costs and reasonable profit that have been included in the price approved or determined by the Office<sup>17</sup>. The economically substantiated costs are costs that have been verified as having been spent and that are necessary for the performance of a regulated activity, while the RONI is entitled to regulate the amount thereof<sup>18</sup>. The reasonable profit is the profit following from the development of the usual share of profit in economically

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<sup>10</sup> Section 25 of the AoR and Section 30 of the AoE.

<sup>11</sup> Section 9 (1) of EU DoIME.

<sup>12</sup> <https://www.sepsas.sk/index.asp>.

<sup>13</sup> Section 6 (2) of the AoE.

<sup>14</sup> Section 7 of the AoE.

<sup>15</sup> Section 12 (1) of the AoR.

<sup>16</sup> Section 12 (2) of the AoR.

<sup>17</sup> Section 12 (3) of the AoR.

<sup>18</sup> Section 2 (e) of the AoR.

substantiated costs, while having regard to the quality, usual business risk, development of the demand in the market and protection of the consumer and also taking into account the scope of necessary investments to secure long-term operability of the system<sup>19</sup>.

Transmission tariffs are currently determined by the calculation method of the maximum price for access to the transmission system and electricity transmission<sup>20</sup>, while the economically substantiated costs that may be included in transmission tariffs also cover depreciation of assets used for a regulated activity, costs for repairs and maintenance of property used to ensure a regulated activity to the extent ensuring the performance of the regulated activity, interest on a loan provided by a bank for the procurement of tangible assets or intangible assets used exclusively for the regulated activity, but also costs for projects of common interest pursuant to Regulation No. 347/2013 of the European Parliament and of the Council (EU) on Guidelines for Trans-European Energy Infrastructure ("**PCI Projects**").

In SK, the principle of ownership unbundling of the TSO from other activities in the energy system is applied, which means that SEPS as a TSO owns and at the same time operates all assets necessary in order to ensure the operation of a transmission system; it is at the same time the only TSO in SK. According to the AoE, a TSO is obliged to provide for reliable, safe, and effective, in the long term, operation of the system under economic conditions subject to environmental protection conditions<sup>21</sup>, observe minimum standards for maintenance and renewal of the transmission system in order to maintain the capacity of and develop the transmission system<sup>22</sup>, provide for system operability<sup>23</sup> and prepare, on an annual basis, a transmission system development plan including an interconnector development plan of for the period of the next ten years and submit the same to the MoE and RONI on an annual basis by 30 November for the next ten years including a report on the performance of a ten-year system development plan<sup>24</sup>.

The TSO issues two documents with a legal significance, specifically (a) Technical Conditions for Access and Conditions for Connection to the System and System Operation Rules<sup>25</sup> (published at its website<sup>26</sup>) and (b) Operating Instructions that are approved by the RONI<sup>27</sup>.

Ad (a): The Technical Conditions contain, including, without limitation, conditions of: (i) access and connection to the system, (ii) technological synergy of the system including the mutual operability of the system, (iii) operation of the system, (iv) provision for the operational safety and reliability of the system, (v) interruption of electricity supplies and (vi) system management<sup>28</sup>. If the technical conditions fail to be in compliance with law or other legal regulations, the RONI shall be entitled to apply to the TSO for a change in the technical conditions within 30 days<sup>29</sup>.

Ad (b): The Operating Instructions contain business terms and conditions for access, connection and operation of the system, while the law allows the application of such business conditions only that are resulting from market rules (issued by RONI's Decree No. 24/2013 Coll., establishing rules for the functioning of the electricity market).

According to the Technical Conditions<sup>30</sup>, the goal of the long-term planning of the transmission system development, as well of the transmission system development itself, is to provide for an adequate development of the infrastructure, refurbishing of facilities based on an assessment of their current condition and ensure the electricity transmission reliability within SK as well as towards foreign countries. Special attention has to be paid to the coordination of the TSO

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<sup>19</sup> Section 2 (f) of the AoR.

<sup>20</sup> Section 3 (d) of the RONI DoRE.

<sup>21</sup> Section 28 (2) (a) of the AoE.

<sup>22</sup> Section 28 (2) (e) of the AoE.

<sup>23</sup> Section 28 (2) (f) of the AoE.

<sup>24</sup> Section 28 (3) (b) of the AoE.

<sup>25</sup> Section 19 (1) and (5) of the AoE.

<sup>26</sup> <https://www.sepsas.sk/TechPod.asp?kod=281>.

<sup>27</sup> Section 19 (7) of the AoE and Section 13 (2) (a) of the AoR.

<sup>28</sup> Section 19 (2) of the AoE.

<sup>29</sup> Section 19 (6) of the AoE.

<sup>30</sup> Chapter N1 of the Technical Conditions of SEPS

([https://www.sepsas.sk/Dokumenty/TechnickePodmienky/2018/01/16/TP-Dok.N\\_2018.pdf](https://www.sepsas.sk/Dokumenty/TechnickePodmienky/2018/01/16/TP-Dok.N_2018.pdf)).

planning with the distribution system operator, electricity producers, with direct customers from the transmission system and with neighbouring TSOs who are integrated into interconnected systems of the Member States and third countries. The goal of long-term transmission system development planning also includes an effective sustainable development and creation of conditions for smooth provision of standard transmission services in terms of operational safety, while the basic criterion has to be the finding of solutions with the lowest costs for final electricity customers in SK. The following shall serve as a basis for planning the SO development:

- a) information from particular specialized divisions of SEPS;
- b) current knowledge of the development of distribution systems in SK;
- c) current knowledge of SEPS of the construction of new electricity generation facilities under preparation;
- d) current knowledge of SEPS of potential large customers who will be connected directed to the transmission system;
- e) conclusions and prerequisites that have resulted from network calculations during verification of previous information (bottlenecks in the system and in cross-border profiles);
- f) previous processing of the SEPS Development Programme;
- g) current information about the development of transmission systems of the neighbouring states;
- h) conclusions of the Impact Study of energy facilities on the power system of SK.

### ***Undertaking of investments***

The TSO is obliged to prepare, on an annual basis, a transmission system development plan including the development plan for interconnectors for the period of next ten years and submit same to the MoE and RONI annually, by 30 November for the next ten years including a report on the performance of a ten-year system development plan<sup>31</sup>. The ten-year plan (i) states main parts of the transmission system that have to be constructed or modernized during the next ten years, together with the expected deadlines of the implementation thereof, (ii) states all investments in the transmission system related to the construction of new capacities or modernization of the transmission system, the implementation of which has already been decided by the transmission system operator or that shall have to be implemented during the next three years, and (iii) determines deadlines for the implementation of the investments<sup>32</sup>. The TSO is obliged to consult on the draft ten-year plan in a non-discriminatory and transparent way with all parties involved (particularly, with the existing and potential users of the system) and allow them to provide their statements thereto<sup>33</sup>.

Control over the observance of the ten-year plan is ensured by the RONI, which is also entitled to require changes in the plan, if it fails to take into account adequate and economically and technically feasible requirements for the implementation of investments in the transmission system or if it is in conflict with the system development plan for the whole EU or with law<sup>34</sup>.

If the TSO fails to implement an investment that should have been implemented according to the ten-year system development plan during the next three years and it concerns an investment that continues to be justified, the RONI shall provide for the implementation of the given investment by taking the following measures: (a) it shall impose an obligation on the TSO to implement the given investment within a period defined by the RONI and (b) if the TSO fails to fulfil this obligation too, the RONI shall carry out the selection procedure in relation to the given investment allowing for the participation in such procedure of all investors in a transparent and non-discriminatory way; a successful investor shall implement an investment on its own responsibility<sup>35</sup> (in such case, the RONI shall approve investment security contracts containing financial arrangements<sup>36</sup>).

The TSO shall further notify the RONI of a plan of investments and plan of depreciations (including those from the investments implemented) for the next year (the so called " $t$ " year) and next two calendar years ( $t+1$  and  $t+2$ ) together with proposed prices for the

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<sup>31</sup> Section 28 (3) (b) of the AoE.

<sup>32</sup> Section 29 (2) of the AoE.

<sup>33</sup> Section 29 (3) and (4) of the AoE.

<sup>34</sup> Section 29 (7) of AoE.

<sup>35</sup> Section 29 (9) of the AoE.

<sup>36</sup> Section 29 (12) of the AoE.

transmission<sup>37</sup>. Currently, a multiannual regulatory period lasting from 1 January 2017 to 31 December 2021 is applied. However, the TSO is entitled to submit proposals to change the prices even during the regulatory period, if justified<sup>38</sup>. The TSO is also obliged to notify the RONI annually, by 30 April, of the amount of actual investments spent in the previous year ( $t-1$ )<sup>39</sup>.

The full responsibility for investment projects is thus held by the TSO, however, with strong powers of the RONI to affect the contents and enforce the implementation thereof.

### **Role of NRA**

The roles of the RONI as a NRA in relation to the Legal Framework in general are described in above. The roles of the RONI are described individually in Sections 2.1.3 to 2.1.52.1.5.

### **Institutional or procedural constraints on the performance of these roles**

Overly complicated permitting proceedings (with several levels of appeal) and the fractured structure of Construction Offices may be regarded as the main institutional and procedural restrictions to transmission system development. In practice, cases when decisions on the construction of electricity lines (as line structures) located in the territory of several municipalities or even regions are made by one of the affected municipalities are problematic as the lead municipality does not have jurisdiction over the others and may not have the specialisation, personnel or technical knowledge needed to assess the application.

This is related to the considerable length of the permitting proceedings, which may often exceed the period of two years (according to the experience in the construction of distribution lines). This is associated, above all, with the reform of construction law and construction process in SK, which has not been implemented so far.

In order to increase the effectiveness of the planning and preparation process, it would be beneficial to create a special Construction Office for investments in energy infrastructure, likewise in the case of investments in motorways, roads and local roads, the decisions on which are made in the first instance directly by the District Office and not by the municipality. An appellate body would in such a case be directly the MoE.

#### **2.1.2. Specific legal rights and duties**

In the first place, the parties involved in the investment planning process within the creation of the ten-year plan include the public, the existing and potential future users of the system (producers, distribution system operators, and final electricity customers), with whom the TSO and RONI have to consult the content of the ten-year plan. The RONI shall be obliged to publish the contents of the consultations including the requirements of the consulting parties at its website<sup>40</sup>.

Depending on the nature of investments, several stakeholders may also be involved in the investment planning and preparation process:

- **municipalities and cities** in the territory of which the construction is to take place; municipalities and cities are entitled within the framework of the self-government performance to approve, in the form of legal regulations, the so-called zoning plans, the contents of which are binding for the location of structures; the construction of transmission system facilities may be assessed as public-service; therefore, it should be contained in the zoning plan of all municipalities, including the small ones (with the population of less than 2,000); municipalities and cities act equally as construction office authorized to issue building permits within the framework of the delegated state administration (an appellate body is the District Office within the framework of the general local state administration). The laws allow for the declaration of a structure also as the so-called significant investment, if the funds necessary for the implementation of the structure are in the sum of no less than EUR 100 million of investment costs, it is significant in terms of national economy and it has been decided so by the Government

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<sup>37</sup> Section 19 (2) (c) of the RONI DoR.

<sup>38</sup> Section 17 (1) and (2) of the AoR.

<sup>39</sup> Section 19 (5) (e) of the RONI DoR.

<sup>40</sup> Section 29 (5) and (6) of the AoE.



of the Slovak Republic.<sup>41</sup> In such a case, the building permit is issued directly by the District Office as a first-instance authority (an appellate body is the Ministry of Transport and Construction of the Slovak Republic). For the purposes of the construction of a significant investment, it is possible to expropriate lands and structures. However, for the purposes of project implementation in the area of the transmission system development, a special regulation, providing for the possibility to place electricity lines and other energy facilities of the transmission system on third-party lands even without any need for the land expropriation, also applies, however, only in the territory situated outside the developed area of the municipality;

- **Environmental impact assessment authorities** are engaged in the EIA process, if it concerns the construction of overhead or underground transmission lines with the voltage level of no less than 220 kV with the length from 15 km. The lines with the length from 5 km to 15 km and the lines with the voltage level from 110 kV to 220 kV with the length from 5 km are subject to an examination procedure aimed at deciding whether the structure will obligatorily be assessed within the EIA process<sup>42</sup>. The public concerned may be involved in the EIA process<sup>43</sup>;
- **MoE**: construction, reconstruction and modernization of lines and other facilities of the transmission system are subject to proceedings for the issuance of a certificate for the construction of an energy facility, which is a necessary basis for further permitting proceedings;
- Other public administration bodies, municipalities (unless acting in the position of the Construction Office) and owners of another infrastructure (gas pipelines, water mains, sewages, caliducts etc.), which are following other legitimate interests in the affected territory (these are the so-called affected bodies). The affected bodies issue, within the framework of planning and building proceedings, binding positions the mutual compliance of which is an assumption for granting a building permit. Such authorities are entitled to make decisions only in the public interest. Conflicts among the affected bodies are solved by superior public authorities.

### **2.1.3. Mechanism for financing of investment projects**

Investments within the Legal Framework are implemented in SK (and have so far been implemented) by SEPS as a TSO. The funding of projects may be divided into the following categories:

#### **Costs Socialization (Through Transmission Tariffs)**

This is the most common tool by which the RONI controls, monitors costs for investments, and reflects them into transmission tariffs. In SK, the *cost + fee* model is applied, which means that the regulated price for access to the transmission system and electricity transmission (the maximum price) shall be determined by the sum of the cost items, which also include planned and approved (by the RONI) depreciations related to the regulated activity as well as costs for PCI Projects.

However, the price regulation rules resulting from the AoR and RONI DoR also regulate motivation tools for the TSO leading to an increase of the interest in investments to ensure long-term, reliable, safe and effective operation of the system, adequate return on assets and stimulation of stable long-term business<sup>44</sup>. It is primarily the method of setting a reasonable profit entering the calculation of the regulated price<sup>45</sup>, determined as a rate of return of the regulatory basis of assets<sup>46</sup> before taxation for the regulatory period (for the years of 2017 through 2021, the value of 6.04 % applies). A motivation aspect is the application of a coefficient of a rate of utilisation of available funds in investments related to the regulated

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<sup>42</sup> Act No. 175/1999 Coll., on Certain Measures Concerning the Preparation of Significant Investments and on Amendment and Supplementation of Certain Acts, as amended.

<sup>43</sup> Section 11 (1) (f) of the AoE.

<sup>44</sup> Annex No. 8 of Act No. 24/2006 Coll., on Environmental Impact Assessment and on Amendment and Supplementation of Certain Acts, as amended.

<sup>45</sup> Section 5 (1) of the RONI DoR.

<sup>46</sup> Section 20 (1) (g) of RONI DoR.

<sup>46</sup> The regulatory basis of assets is the initial approved value corresponding to the general value of assets necessarily associated with the regulated activity revaluated as of 1 January 2011 (Section 19 (1) (f) of the RONI DoR).

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activity<sup>47</sup>, defined by the RONI within the interval from 0.90 to 1.00, by which the amount of reasonable profit is adjusted.

Another tool is the so-called factor of investments ( $FINVP_t$ ), which is also added to eligible costs and reasonable profit and the amount of which corresponds to a difference between the value of the actual approved depreciations from approved investments included in the regulatory basis of assets in the t-3 year and the planned approved depreciations from approved investments included in the regulatory basis of assets in the t-3 year.

The transmission tariffs approved in such a manner are applied to final electricity customers directly connected to the transmission system and to distribution system operators who include them in distribution tariffs applied to final customers connected to distribution systems<sup>48</sup>. Transmission tariffs are paid, however, also by electricity producers directly connected to the transmission system (G-component), while such tariffs are applied in such a manner that the planned payments paid by the electricity producers are in the amount of no more than the revenue determined as a product of 0.50 EUR/MWh and the planned volume of the electricity supply to the transmission system<sup>49</sup>.

### **Connecting Europe Facility**

Some PCI Projects may be co-funded from various EU funds, e.g. the Connecting Europe Facility fund<sup>50</sup>, from which the PCI Project of the 2 x 400 kV Gabčíkovo (SK) - Gönyű (HU) - Veľký Ďur (SK) cross-border lines<sup>51</sup> and the project of the 2 x 400 kV Rimavská Sobota (SK) - Sajoivánka (HU) cross-border lines are funded, for example. The fund has contributed by 50 % of the required sum for engineering and project activities for a part of the lines implemented in the territory of SK, namely for both projects. This project is currently in the phase following the issuance of a planning permit, while other permitting proceedings are pending. The project aims to increase the transmission capacity between the transmission systems of Slovakia and Hungary as well as to increase safety and reliability of operation of the transmission system of the SR on a very exposed cross-border transmission profile within the framework of the eastern region of Central Europe.

### **Bohunice International Decommissioning Support Fund**

SEPS has obtained a grant from this fund administered by the European Bank for Reconstruction and Development allowing for co-funding of several investments concerning the transmission system development and modernization towards the cost of the supply of electrical and instrumentation and control equipment and related works and services as required for the reconstruction projects of Substation Bystricany - transformation 400/110 kV, Substation Horna Zdana - enlargement, Substation Krizovany - enlargement to adapt the substations to the conditions of the grid after the final shutdown of Bohunice Nuclear Power Plant, Units 1 and 2 (Bohunice V1 NPP). The investment will be co-funded from the Fund's resources up to the amount of 50 %. These projects are currently being implemented.

### **Mechanisms to foster innovation:**

The vast majority of investments within the Legal Framework are implemented by SEPS through socialization (by means of price regulation). Annually, SEPS spends approx. EUR 69 million for investments, while the current Ten-Year Plan expects investments in the transmission system development until the end of 2026 in the volume of approx. EUR 694 million<sup>52</sup>. The most common investments funded in this way include constructions of switching stations, switch rooms, transformers, lines, construction of fibre lines, deployment and replacement of remote control, etc.

The projects that are not implemented in this way (partially) are stated above.

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<sup>47</sup> Section 20 (1) (h) of the RONI DoR.

<sup>48</sup> Section 27 (1) of the RONI DoR.

<sup>49</sup> Sections 19 (9) and (10) of the RONI DoR.

<sup>50</sup> <https://ec.europa.eu/inea/en/connecting-europe-facility>.

<sup>51</sup> <http://www.mhsr.sk/energetika/medzinarodna-spolupraca/projekty-spolocneho-zaujmu-pci/elektroenergetika/3161-vedenie-2-x-400-kv-gabcikovo-sk-goenyu-hu-velky-dur-sk>.

<sup>52</sup> [https://www.sepsas.sk/Dokumenty/ProgRozvoj/2017/04/DPR\\_PS\\_2017\\_2026.pdf](https://www.sepsas.sk/Dokumenty/ProgRozvoj/2017/04/DPR_PS_2017_2026.pdf).

Save for the components that are summarized in the regulation rules described above, we currently see no other components, which would particularly stimulate TSO investments. We rather believe that the decision-making practice of the RONI, which is strongly focused on keeping the final electricity price stable, may dissuade from such investments.

***Measures to establish a balance between investing in new or innovative network infrastructure to meet the needs of current and future users in a timely manner and avoiding investment in stranded assets***

According to AoE Section 28 (4) The transmission system operator shall, when making decisions on the development of the transmission system, give consideration to ensuring the management of the energy efficiency of the transmission system, including interconnection capacities, so that the transmission system is capable of ensuring energy efficiency without additional new investment into transmission equipment.

Based on several analyses by SEPS, it is proved it would be inefficient to automatically replace existing 220 kV facilities after reaching their lifetime by similar new facilities again on the same voltage level. In the Slovak transmission system there currently continues a process of gradual complex and managed attenuation and replacement of 220 kV transmission facilities by the 400 kV facilities, where appropriate. It is a long-term strategic goal of SEPS. At present, a time schedule of this gradual controlled attenuation of 220 kV transmission system is being processed in a way so as to prevent the negative operational or economic impact on the SEPS activity.<sup>53</sup>

***2.1.4. Regulatory rules with respect to innovation***

**Specific duties of the TSO aimed at encouraging innovation**

The TSO has no express duties aimed at supporting or encouraging innovation.

The RONI has wide competence in approving the TSO's ten-year transmission system development plan including the development plan for interconnectors and through the creation of price regulation rules. Within such authorizations, RONI is entitled to suggest changes in the scope and nature of the investments in transmission system development (including to encourage innovation and modernisation) and regulates costs that shall be included in the transmission tariffs including the setting of various incentives for innovation and modernisation specifically. In this respect, the law provides the RONI with a broad framework. Greater initiative from the RONI can be expected at times when there is less focus on keeping low prices for social and political reasons exists.

**Specific duties of the NRA aimed at encouraging innovation**

RONI has no express duties aimed at supporting or encouraging innovation.

The RONI has wide competence in approving the TSO's ten-year transmission system development plan including the development plan for interconnectors and through the creation of price regulation rules. Within such authorizations, RONI is entitled to suggest changes in the scope and nature of the investments in transmission system development (including to encourage innovation and modernisation) and regulates costs that shall be included in the transmission tariffs including the setting of various incentives for innovation and modernisation specifically. In this respect, the law provides the RONI with a broad framework. Greater initiative from the RONI can be expected at times when there is less focus on keeping low prices for social and political reasons exists.

***2.1.5. Regulatory rules with respect to security of supply***

**Specific duties of the TSO aiming at safeguarding security of supply**

Duties, including those applicable to security of supply, are more fully described in Sections 2.1.12.1.1 and 2.1.3 above. The TSO will also have a role in delivering/participating in mechanisms, which support security of supply objectives. These specific mechanisms and the TSO's role in them are more fully explained in Sections 2.1.1 and 2.1.3 and below.

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<sup>53</sup> Ten-year network development plan for the years 2016 – 2025. CEPS 2015. Available: [http://www.sepsas.eu/seps/Dokumenty/ProgRozvoj/2016/05/DPR\\_PS\\_2016\\_2025\\_en.pdf](http://www.sepsas.eu/seps/Dokumenty/ProgRozvoj/2016/05/DPR_PS_2016_2025_en.pdf). Page 32.

### **Specific duties of the NRA aiming at safeguarding security of supply**

The RONI has wide competence in approving the ten-year transmission system development plan including the development plan of interconnectors and creation of price regulation rules. Within such authorizations, it is entitled to suggest changes in the scope and nature of the investments in the transmission system development and regulate costs that shall be included in the transmission tariffs including the setting of various motivation aspects. In this respect, the law provides the RONI with a broad framework. Greater initiative from the RONI can be expected in the event no excessive effort to keep low prices for social and political reasons exists.

More information about such authorizations is stated within Section 2.1.1 and 2.1.3.

## **2.2. Regulatory practice**

### **2.2.1. Overview over regulatory practice in Slovakia**

We have not received any feedback to our questionnaires and requests from the electricity sector. Therefore, a description and analysis of the regulatory practice cannot be given.

### **2.2.2. Regulatory practice related to innovation**

(see above).

### **2.2.3. Regulatory practice related to security of supply**

(see above).

### **2.2.4. Illustrative specific projects**

The following projects are examples of successful innovative or security of supply projects and hence illustrate how the regulatory regime works in practice.

#### **Projects supported by Connecting Europe Facility**

Some PCI Projects may be co-funded from various EU funds, e.g. the Connecting Europe Facility fund<sup>54</sup>, from which the PCI Project of the 2 x 400 kV Gabčíkovo (SK) - Gönyű (HU) - Veľký Ďur (SK) cross-border lines<sup>55</sup> and the project of the 2 x 400 kV Rimavská Sobota (SK) - Sajoivánka (HU) cross-border lines are funded, for example. The fund has contributed by 50 % of the required sum for engineering and project activities for a part of the lines implemented in the territory of SK, namely for both projects. This project is currently in the phase following the issuance of a planning permit, while other permitting proceedings are pending. The project aims to increase the transmission capacity between the transmission systems of Slovakia and Hungary as well as to increase security of supply and reliability of operation of the transmission system of the SR on a very exposed cross-border transmission profile within the framework of the eastern region of Central Europe.

#### **Projects supported by Bohunice International Decommissioning Support Fund**

The Slovakian TSO SEPS has obtained a grant from this fund administered by the European Bank for Reconstruction and Development allowing for co-funding of several investments concerning the transmission system development and modernization of equipment aiming at increasing security of supply. To adapt the substations to the conditions of the grid after the final shutdown of Bohunice Nuclear Power Plant, Units 1 and 2 (Bohunice V1 NPP) substations Horna Zdana and Krizovany are enlarged and the substation Bystricany is reconstructed. The work includes electrical instrumentation and control equipment as well as related works and services. The investment will be co-funded from the Fund's resources up to the amount of 50 %. These projects are currently being implemented.

#### **Projects funded by the regular tariff**

Within the framework of Gabčíkovo – Veľký Ďur project 400 kV double lines with the length of approx. 93 km and a new 400 kV Gabčíkovo switching station have been constructed.

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<sup>54</sup> <https://ec.europa.eu/inea/en/connecting-europe-facility>.

<sup>55</sup> <http://www.mhsr.sk/energetika/medzinarodna-spolupraca/projekty-spolocneho-zaujmu-pci/elektroenergetika/3161-vedenie-2-x-400-kv-gabcikovo-sk-goenyu-hu-velky-dur-sk>.

In addition, reliability of the feed-in power of the Gabčíkovo Hydraulic Power Plant that supplies the Capital City of the SR Bratislava, as well as reliability of feed-in power from the Mochovce Nuclear Power Plant (completed in 2016) has been substantially increased for security of supply reasons but also using innovative solutions. This is due to the construction of an optical interconnection between the Moldava Electrical Substation and Kapušany Electrical Substation and commissioning of innovative management and information system at the Slovak Power Dispatching and Control Centre.

## **2.3. Options for improvement**

### **2.3.1. *Options to improve regulatory practice***

Due to the lack of response, we could not identify any improvement options.

### **2.3.2. *National law mechanism(s) for implementing options***

(see above).

### **2.3.3. *Impact assessment***

(see above).

### 3. GAS

#### 3.1. Legal analysis of the NRF in Slovakia

##### 3.1.1. Overview of the regulatory framework of Slovakia – legal rules

The Act No. 250/2012 Coll. from 31 July 2012 on regulation in network industries and Act No. 251/2012 Coll. from 31 July 2012 on energy and on the amendment of certain laws ("**AoE**") are the principal pieces of primary legislation governing the legal framework for gas in the Slovak Republic. The secondary legislation related to gas activities in the Slovak Republic comprises also a Decree of the Regulatory Office for Network Industries No. 24/2013 Coll. from 14 January 2013 laying down the rules for the internal gas market (Gas Market Rules).

The Slovak NRA (Regulatory Office for Network Industries) ("**RONI**") as well as the Ministry of Economy of the Slovak Republic ("**MoE**") are the main state authorities in this area, which derive their primary duties, objectives and powers from the above-mentioned acts.

The other strategic documents related to innovation and security of supply in gas infrastructure are the Energy Policy of the Slovak Republic and the Strategy of the Energy Security of the Slovak Republic:

- Energy Policy of the Slovak Republic<sup>56</sup> is the strategic document, which defines the main objectives and priorities of the energy sector until 2035 with the outlook until 2050. Based on § 88 of the Energy Act the MoE is responsible authority for preparation of the energy policy for the period of at least 20 years ahead and its update in at least five-year horizon. The aim of the energy policy is by providing the long-term sustainability of the Slovak energy to contribute to the sustain development of the national economy and its competitiveness. From this point of view, the priority is to provide the security, stability and efficiency of the energy supplies as well as the protection of the environment. The main task of the energy policy is to create stable framework for secure internal energy market, which encourages the investments in the energy sector;
- The aim of the Energy Security of the Slovak Republic is to achieve competitive energy sector by providing secure, stable and efficient energy supplies for appropriate prices with respecting the protection of the consumers, the environmental protection, the long-term sustainability, security of supplies and technical security. The Energy Security of the Slovak Republic with the outlook until 2030 should provide optimal regulatory policy (including price policy), pro-export ability of the Slovak Republic, strengthen the Slovak Republic as a transit country in the electricity, gas and oil markets and safeguard energy supplies. It is inevitable to support the diversification of the gas and oil sources and routes and create the condition for building the interconnectors with the neighbouring countries, to promote the RES and to promote the consumption of domestic energy sources with the aim to eliminate import dependency.

#### Legal Framework in SK:

The principal legal regulation defining the Legal Framework is AoE effective from 1 September 2012, adopted in order to transpose Directive 2009/73/EU of the European Parliament and of the Council concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC (the "**EU DoIMNG**"). Powers of the national regulatory office – RONI and framework conditions of regulation of the Legal Framework are governed by Act No. 250/2012 Coll., on Regulation in Network Industries, as amended (the "**AoR**"), effective also from 1 September 2012. Certain (below-specified) powers in the area of the Legal Framework are also held by the MoE as a central public authority and energy policy guarantor. Roles of the RONI and MoE in the area of the Legal Framework are as follows:

#### The MoE:

- ensures the monitoring of compliance with security of electricity and gas supplies<sup>57</sup>;
- takes measures aimed at safeguarding security of natural gas supplies, while, for the purpose of the performance of such measures, the MoE may impose various measures

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<sup>56</sup> <http://www.economy.gov.sk/energetika/energeticka-politika/energeticka-politika-a-strategia-energetickej-bezpecnosti>.

<sup>57</sup> Section 88 (2)(c) of the AoE.

- of a financial as well as non-financial nature including the provision of economic incentives<sup>58</sup>;
- determines the scope of criteria of technical safety of the system and network<sup>59</sup> by means of an implementing regulation, currently being Decree No. 346/2012 Coll., on Prerequisites of Application for Granting Prior Consent;
- decides on the issuance of a certificate for the construction of an energy facility (subject to compliance of an investment plan with the energy policy of the Slovak Republic) – it covers cases of construction of new transmission system facilities<sup>60</sup> (reconstruction and modernisation of existing facilities do not require the issuance of the MoE certificate).

The RONI:

- ensures material and price regulation in the energy sector based on the transparency and non-discrimination principle by providing for availability of goods and related regulated activities at reasonable prices and in specified quality<sup>61</sup>, grants licenses for pursuing business in the energy sector<sup>62</sup>, approves prices and tariffs for natural gas transmission through individual pricing decisions<sup>63</sup>, while providing for details of the price regulation in implementing regulations; currently, it concerns Decree No. 223/2016 Coll., establishing a price regulation in the natural gas sector (the “**RONI DoRNG**”);
- carries out transmission system operator (“**TSO**”) certification in terms of the assessment of the compliance with requirements of the 3<sup>rd</sup> EU legislative package, while applying the principle of ownership unbundling of the TSO from other activities in the energy sector<sup>64</sup>.

The AoE defines basic conditions for pursuing business in the energy sector in the market in SK. Licences are granted by the RONI, specifically, for the activities of production, transmission, distribution, storage and supply of gas. As regards natural gas transmission, in SK’s conditions, the **independent transmission operator** principle is applied<sup>65</sup> – the Slovak TSO is a member of a vertically integrated company. The natural gas transmission activity is performed in SK by a single entity only, specifically, by eustream, a.s. (“**eustream**”). Company eustream is a 100 % subsidiary of the company SPP Infrastructure, a.s. which is owned by State (51 %) and company seated in Czech Republic Energetický a průmyslový holding, a.s. (49 %).

In order to obtain the required licence and permissions, the TSO must comply with the following conditions<sup>66</sup>:

- location of the seat, enterprise or branch of a legal person in a designated territory;
- professional competence to perform the required activities;
- proving technical prerequisites for the performance of the activities requested to be covered by the permission;
- designation of a responsible representative;
- integrity of this legal person or integrity of the statutory authority or members of the statutory authority.

In terms of the Legal Framework, the area of price regulation of transmission tariffs, which is ensured by the RONI, is important. Pursuant to the AoR, price regulation may only be performed in one of the following ways, specifically, by (i) direct determination of a fixed price from which no deviation is allowed, (ii) direct determination of the maximum price which may not be exceeded, (iii) determination of the fixed price calculation method, (iv) determination of the maximum price calculation method, (v) determination of the scope of economically substantiated costs which may be included in the price and of the amount of a reasonable profit, (vi) determination of the price by applying market measures, such as, auctions<sup>67</sup>.

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<sup>58</sup> Section 88 (2)(d) of the AoE and Section 88 (6) of AoE.

<sup>59</sup> Section 88 (2)(e) of the AoE.

<sup>60</sup> Section 12 of the AoE.

<sup>61</sup> Section 3 (1) of the AoR.

<sup>62</sup> Section 4 of the AoE.

<sup>63</sup> Section 11, 12 and 14 of the AoR.

<sup>64</sup> Section 25 of the AoR and Section 30 of the AoE.

<sup>65</sup> Section 9 (1) of EU DoIMNG.

<sup>66</sup> Section 7 of the AoE.

<sup>67</sup> Section 12 (1) of the AoR.

The maximum price or the fixed price may also be determined by comparing (a) the calculation method of the maximum price for access to the transmission system and natural gas transmission, (b) the calculation method of the maximum price for access to the transmission system and natural gas transmission, (c) particular components forming the structure of the price for regulated activities with components forming the structure of the price of identical regulated activities in the Slovak Republic or Member States, or (d) price for the regulated activity with the price for an identical regulated activity in the Slovak Republic or Member States<sup>68</sup>. The price regulation method must take into account economically substantiated costs, economic efficiency and reasonable profit including the scope of investments that may be included in the price or economically substantiated costs and reasonable profit that have been included in the price approved or determined by the Office<sup>69</sup>. The economically substantiated costs are costs that have been verified as having been spent and that are necessary for the performance of a regulated activity, while the RONI is entitled to regulate the amount thereof<sup>70</sup>. The reasonable profit is the profit following from the development of the usual share of profit in economically substantiated costs, while having regard to the quality, usual business risk, development of the demand in the market and protection of the consumer and also taking into account the scope of necessary investments to secure long-term operability of the system<sup>71</sup>.

Natural gas transmission tariffs are currently determined by the maximum price for access to the transmission system and natural gas transmission, namely, by applying the method of benchmarking the price for access to the transmission network and gas transmission in EU Member States<sup>72</sup>. This means that neither eligible costs nor reasonable profits are taken into account in the transmission tariff regulation process and tariffs are determined based on an analysis of prices for gas transmission in other Member States of the European Union for the t-4, t-3, t-2 and t-1 years; the analysis is prepared by the TSO itself<sup>73</sup>. The analysis compares, above all, transmission network operators using an input-output tariff system and transmission network operators in EU Member States neighbouring with SK<sup>74</sup>. The said regulation method has been the subject of criticism by the European Commission, since it does not use the benchmarking method as a complementary but exclusive method of regulation (it does not use the cost method); so far, this regulation method has not been changed<sup>75</sup>.

### ***Undertaking of investments***

Gas transmission is a regulated business activity in the Slovak Republic. Eustream as a Slovak TSO operates a high-pressure gas transmission system that is interconnected with major European transmission systems in Ukraine, Czech Republic, Austria and Hungary. Eustream fulfils its obligation as a TSO under the licence for gas transmission issued by the RONI.

In SK, the principle of an independent TSO is applied, which means that eustream as a TSO owns and at the same time operates all assets necessary in order to ensure the operation of a transmission system; it is at the same time the only TSO in SK. According to the AoE, a TSO is obliged to provide for reliable, safe and efficient operation of the transmission network in the interest of creating an open market with gas<sup>76</sup>, ensure maintenance and development of the transmission system in compliance with conditions for the protection of environmental protection<sup>77</sup>, ensure the establishment of cross-border connections necessary for integration of the transmission networks in Member States with sufficient capacity to enable satisfaction of all economically justified and technically feasible requests of gas market participants for the capacity of cross-border interconnections, while accounting for the requirements of gas supply security<sup>78</sup> and prepare, on an annual basis, a transmission system development plan for the period of the next ten years and submit the same to the MoE and RONI on an annual basis by

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<sup>68</sup> Section 12 (2) of the AoR.

<sup>69</sup> Section 12 (3) of the AoR.

<sup>70</sup> Section 2 (e) of the AoR.

<sup>71</sup> Section 2 (f) of the AoR.

<sup>72</sup> Section 3 (e) of the RONI DoRNG.

<sup>73</sup> Section 7 (1) of RONI DoRNG.

<sup>74</sup> Section 7 (2) of RONI DoRNG.

<sup>75</sup> EU Pilot Ref. No. 8073/15/ENER.

<sup>76</sup> Section 49 (6) (a) of the AoE.

<sup>77</sup> Section 49 (6) (b) of the AoE.

<sup>78</sup> Section 49 (6) (c) of the AoE.



30 November for the next ten years including a report on the performance of a ten-year system development plan<sup>79</sup>.

The TSO issues two documents with a legal significance, specifically (a) Technical Conditions for Access and Conditions for Connection to the System and System Operation Rules<sup>80</sup> (published at its website<sup>81</sup>) and (b) Operating Instructions that are approved by the RONI<sup>82</sup>.

Ad (a): The Technical Conditions contain, including, without limitation, conditions of: (i) access and connection to the system, (ii) technological synergy of the system including the mutual operability of the system, (iii) operation of the system, (iv) provision for the operational safety and reliability of the system, (v) interruption of natural gas supplies and (vi) system management<sup>83</sup>. If the technical conditions fail to be in compliance with law or other legal regulations, the RONI shall be entitled to apply to the TSO for a change in the technical conditions within 30 days<sup>84</sup>.

Ad (b): The Operating Instructions contain business terms and conditions for access, connection and operation of the system, while the law allows the application of such business conditions only that are resulting from market rules (issued by RONI's Decree No. 24/2013 Coll., establishing rules for the functioning of the natural gas market).

### Role of NRA

The roles of the RONI as a NRA in relation to the Legal Framework in general are described above already. The roles of the RONI are described individually in Sections 3.1.3 to 3.1.5 below.

#### 3.1.2. *Specific legal rights and duties*

In the first place, the parties involved in the investment planning process within the creation of the ten-year plan include the public, the existing and potential future users of the system (producers, distribution system operators, and final natural gas customers), with whom the TSO and RONI have to consult the content of the ten-year plan. The RONI shall be obliged to publish the contents of the consultations including the requirements of the consulting parties at its website<sup>85</sup>.

Depending on the nature of investments, several stakeholders may also be involved in the investment planning and preparation process:

- **municipalities and cities** in the territory of which the construction is to take place; municipalities and cities are entitled within the framework of the self-government performance to approve, in the form of legal regulations, the so-called zoning plans, the contents of which are binding for the location of structures; the construction of transmission system facilities may be assessed as public-service; therefore, it should be contained in the zoning plan of all municipalities, including the small ones (with the population of less than 2,000); municipalities and cities act equally as construction office authorized to issue building permits within the framework of the delegated state administration (an appellate body is the District Office within the framework of the general local state administration). The laws allow for the declaration of a structure also as the so-called significant investment, if the funds necessary for the implementation of the structure are in the sum of no less than EUR 100 million of investment costs, it is significant in terms of national economy and it has been decided so by the Government of the Slovak Republic.<sup>86</sup> In such a case, the building permit is issued directly by the District Office as a first-instance authority (an appellate body is the Ministry of Transport and Construction of the Slovak Republic). For the purposes of the construction of a significant investment, it is possible to expropriate lands and structures. However, for the purposes of project implementation in the area of the transmission system development, a special regulation, providing for the possibility to place gas pipelines and

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<sup>79</sup> Section 49 (7) (h) of the AoE.

<sup>80</sup> Section 19 (1) and (5) of the AoE.

<sup>81</sup> [http://www.eustream.sk/files/docs/sk/technicke\\_podmienky.pdf](http://www.eustream.sk/files/docs/sk/technicke_podmienky.pdf).

<sup>82</sup> Section 19 (7) of the AoE and Section 13 (2) (a) of the AoR.

<sup>83</sup> Section 19 (2) of the AoE.

<sup>84</sup> Section 19 (6) of the AoE.

<sup>85</sup> Section 59 (4) and (5) of the AoE.

<sup>86</sup> Act No. 175/1999 Coll., on Certain Measures Concerning the Preparation of Significant Investments and on Amendment and Supplementation of Certain Acts, as amended.



other facilities of the transmission system on third-party lands even without any need for the land expropriation, also applies, however, only in the territory situated outside the developed area of the municipality;

- **Environmental impact assessment authorities** are engaged in the EIA process, if it concerns the construction of overhead or underground transmission lines with the voltage level of no less than 220 kV with the length from 15 km. The lines with the length from 5 km to 15 km and the lines with the voltage level from 110 kV to 220 kV with the length from 5 km are subject to an examination procedure aimed at deciding whether the structure will obligatorily be assessed within the EIA process<sup>87</sup>. The public concerned may be involved in the EIA process<sup>88</sup>;
- **MoE**: construction of new facilities of the transmission system are subject to proceedings for the issuance of a certificate for the construction of an energy facility, which is a necessary basis for further permitting proceedings;
- Other public administration bodies, municipalities (unless acting in the position of the Construction Office) and owners of another infrastructure (gas pipelines, water mains, sewages, district heating etc.), which are following other legitimate interests in the affected territory (these are the so-called affected bodies). The affected bodies issue, within the framework of planning and building proceedings, binding positions the mutual compliance of which is an assumption for granting a building permit. Such authorities are entitled to make decisions only in the public interest. Conflicts among the affected bodies are solved by superior public authorities.

### **3.1.3. Mechanism for financing of investment projects**

Investments within the Legal Framework are implemented in SK (and have so far been implemented) by eustream as a TSO. The funding of projects may be divided into the following categories:

#### **Socialization**

Given the method of the transmission tariff price regulation applied by the RONI and detailed in Section 3.1.1 the RONI does not have direct control over costs of investments and depreciations. The RONI does not have any motivation tool at its disposal either, by which it could influence the TSO in order to increase its interest in investments. Within the framework of the transmission tariff benchmarking method, the RONI compares total average prices for gas transmission between input-output points of the transmission network and their conversion to units of length, an overview of products being used that are offered by network operators and benchmarking of a) costs for balancing, b) costs for network operation, c) depreciations and d) revenues for the provision of services in transmission networks<sup>89</sup>.

The transmission tariffs approved in such a manner are applied towards final gas customers directly or indirectly (through distribution system operator) connected to the transmission system.

#### **Connecting Europe Facility**

Some investment projects may be co-funded from various EU funds, e.g. the Connecting Europe Facility fund<sup>90</sup>, from which the "Poland-Slovakia Interconnection of Gas Transmission Networks" project is funded, for instance; this project is included among projects of common interest pursuant to Regulation No. 347/2013 of the European Parliament and of the Council (EU) on Guidelines for Trans-European Energy Infrastructure. A study and engineering works on the project have been co-funded from the fund.

#### **Trans - European Energy Networks Programme (TEN-E)**

In 2013, eustream received financial support from the European Union from the TEN-E<sup>91</sup> support programme for the preparation of a feasibility study for the "Polish-Slovak

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<sup>87</sup> Section 11 (1) (f) of the AoE.

<sup>49</sup> Annex No. 8 of Act No. 24/2006 Coll., on Environmental Impact Assessment and on Amendment and Supplementation of Certain Acts, as amended.

<sup>88</sup> Section 7 (4) of RONI DoRNG.

<sup>89</sup> <https://ec.europa.eu/inea/en/connecting-europe-facility>.

<sup>90</sup> <https://ec.europa.eu/energy/en/topics/infrastructure/trans-european-networks-energy>.

Interconnection of Gas Transmission Networks” project as well as for the “Modification of Turbo Machine Sets Nuovo Pignone 23 MW into DLE” project.

### **Special treatment for the Polish-Slovak Interconnection of Gas Transmission Networks during operation**

In relation to the above-mentioned project of the “Polish-Slovak Interconnection of Gas Transmission Networks”, a special treatment shall be implemented for the TSO pursuant to Regulation No. 347/2013 of the European Parliament and of the Council (EU) on Guidelines for Trans-European Energy Infrastructure, specifically, by Decision of the RONI No. 0001/2016/P-ST of 7 November 2016<sup>92</sup>. This decision relates to the period after the project completion and its putting into commercial operation. The incentives will be provided on an annual basis upon starting the commercial operation of the gas pipeline for the period of its operation, provided that the actual annual revenues from sale of transmission capacities in the planned entry-exit point of the Polish-Slovak border are lower in the relevant year than the average of total annual planned revenues of the project for the period 2021-2040 as per the updated document “Poland – Slovakia Interconnector Business Plan and Project Specific Cost Benefit Analysis Update”, which has been received by the Regulatory Office for Network Industrial during the proceedings for the provision of the incentives. The annual amount of the incentives provided shall be determined as a difference of the average of total annual planned revenues of the project and actual annual revenues from sale of transmission capacities in the planned entry-exit point of the Polish-Slovak border. The specific form of the incentives shall be decided by the RONI, while it can be expected that it will be a decision in the tariff area (i.e. in the form of a special transmission tariff surcharge).

Such decision of the RONI may be reproached for insufficient transparency, since the RONI has not published its methodology and criteria used to evaluate investments in electricity and gas transmission infrastructure projects and higher risks, raised by them pursuant to Article 13 (6) of Regulation No. 347/2013<sup>93</sup>.

Given the lack of publicly available information, it cannot be unequivocally stated which of the said mechanisms of project funding prevails. However, we believe that given the scope of the projects to be funded from the EU funds, a major part of the investments is funded in this form.

### **Mechanisms to foster innovation**

We currently see no components, which would particularly stimulate TSO investments. We rather believe that the decision-making practice of the RONI, which is strongly focused on keeping the final gas price stable, may dissuade from such investments.

### **Measures to establish a balance between investing in new or innovative network infrastructure to meet the needs of current and future users in a timely manner and avoiding investment in stranded assets**

In SK, we do not see any special efforts to attain such balance. If so, it may only be reached based on mutual communication between the RONI and eustream in preparing the ten-year plan and formulating price regulation rules.

#### **3.1.4. Regulatory rules with respect to innovation**

##### **Specific duties of the TSO aimed at encouraging innovation**

The TSO has no express duties aimed at supporting or encouraging innovation.

The RONI has wide competence in approving the TSO’s ten-year transmission system development plan including the development plan for interconnectors and through the creation of price regulation rules. Within such authorizations, RONI is entitled to suggest changes in the scope and nature of the investments in transmission system development (including to encourage innovation and modernisation) and regulates costs that shall be included in the transmission tariffs including the setting of various incentives for innovation and modernisation

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<sup>92</sup> [http://www.urso.gov.sk:8088/CISRES/Agenda.nsf/0/8AC268DE13721B0DC1258064002DE8E1/\\$FILE/0001\\_2016\\_P-ST.pdf](http://www.urso.gov.sk:8088/CISRES/Agenda.nsf/0/8AC268DE13721B0DC1258064002DE8E1/$FILE/0001_2016_P-ST.pdf).

<sup>93</sup> <http://energia.sk/dolezite/zemny-plyn-a-ropa/eustream-si-prepojenie-s-polskom-poistil-stimulmi-od-urso/22173/>.

specifically. In this respect, the law provides the RONI with a broad framework. Greater initiative from the RONI can be expected at times when there is less focus on keeping low prices for social and political reasons exists.

### **Specific duties of the NRA aimed at encouraging innovation**

The RONI has wide competence in approving the ten-year transmission system development and creation of price regulation rules. In this respect, the law provides the RONI with a broad framework. Unfortunately, the RONI uses such authorizations minimally. Greater initiative from the RONI can be expected in the event no excessive effort to keep low prices for social and political reasons exists.

More information about such authorizations is stated within Sections 3.1.1 and 3.1.3.

### **3.1.5. Regulatory rules with respect to security of supply**

#### **Specific duties of the TSO aiming at safeguarding security of supply**

Duties, including those applicable to security of supply, are more fully described in Sections 3.1.1 and 3.1.3 above. The TSO will also have a role in delivering/participating in mechanisms, which support security of supply objectives. These specific mechanisms and the TSO's role in them are already fully explained in Sections 3.1.1 and 3.1.3.

#### **Specific duties of the NRA aiming at safeguarding security of supply**

RONI has no express duties aimed at supporting or encouraging innovation.

The RONI has wide competence in approving the TSO's ten-year transmission system development plan including the development plan for interconnectors and through the creation of price regulation rules. Within such authorizations, RONI is entitled to suggest changes in the scope and nature of the investments in transmission system development (including to encourage innovation and modernisation) and regulates costs that shall be included in the transmission tariffs including the setting of various incentives for innovation and modernisation specifically. In this respect, the law provides the RONI with a broad framework. Greater initiative from the RONI can be expected at times when there is less focus on keeping low prices for social and political reasons exists.

## **3.2. Regulatory practice**

### **3.2.1. Overview over regulatory practice in Slovakia**

The general regulatory principle in the gas transmission sector can be described as price cap regulation. The price cap in Slovakia is calculated solely by benchmarking against transmission tariffs in other EU Member States for the previous 4 years. Neither the TSOs costs nor a reasonable rate of return is taken into account. Furthermore, due to social and political reasons, the NRA's focus is said to be on keeping prices low.

In the Slovakian gas transmission sector, there are to the best of our knowledge no explicit duties for the TSO aimed at encouraging innovation. Also, the NRA does not have explicit statutory power to encourage innovation, but the NRA has broad powers to approve innovative projects in the development plan.

### **Main regulatory barriers**

We received only limited response from the gas sector. Therefore, the analysis of the regulatory practice might not cover views of all relevant stakeholders.

As already mentioned above, the mechanism in Slovakian gas sector is an outlier in the type of financing mechanism used. From this one could conclude that these aspects may give rise to a risk that the TSO cannot generate enough profit from the tariffs that have been set and therefore investment may be curtailed.

In practice, these presumptions seem not to be manifesting because the interviewees were generally satisfied with the NRF regarding support of security of supply as well as innovative projects and did not mention issues with this particular type of financing mechanism.

According to the interviewees, there are no large obstacles in the NRF and investments are sufficiently refunded. The framework is set up from direct legislation of EU law, which offers scope for optimisation in certain details. Rather than expressing improvement needs, interviewees underline that regulation should be stable and not constantly be changed. In the interviewees' eyes the Slovakian tax system, that burdens companies in certain business sectors (e.g. energy) with higher taxes than in other sectors, provides disadvantages for the energy sector but the tax regime is not part of the regulatory framework this study is focussing on, so this aspect will not be considered further on.

Besides this, some of the interviewees see a potential issue concerning the regulatory treatment of international lines crossing more than one country, which is more related to market rules rather than the TSO regulation but should be reported for the sake of completeness. Following EU legislation there are two general options of the regulatory treatment. Either a line is exempted from regulation (it was said that most lines are built under that regime) or the national regulatory treatment of each country crossed has to be respected. Interviewees see the issue that the regulatory framework usually is nationally oriented and is only focussed on one border. Typically, capacity between countries is auctioned and therefore, shippers must buy capacity at each border with the risk to have bids refused at a single border, so the shipment cannot be made as planned.

### **Possible improvement of the NRF**

From the interviews, the following improvements to the NRF could be derived:

- Considering NRA's focus is said to be on keeping prices low this could inhibit the application of innovative solutions, so it could be considered useful to increase support for innovative projects.

### **3.2.2. Regulatory practice related to innovation**

#### **Innovative projects and adequacy of the NRF relating to its support for these projects**

To the best of our knowledge, the TSO does not have explicit duties aimed at encouraging innovation. Also, the NRA does not have explicit statutory power to encourage innovation, but the NRA has broad powers to approve innovative projects in the development plan.

In general, the interviewees regard any of their projects that are in line with the EU goals (market integration, renewable and sustainable energy provision etc.) as innovative. In the interviewees' view, the NRF is generally adequate to support these projects. In the past, there was only one interconnection to Russia, so an expansion of the grid to other countries of origin that can deliver natural gas is seen as innovation. Related projects are for example the interconnector between Slovakia and Hungary (completed in 2013; that could be regarded as PCI today maybe but initiated before PCI legislation) as well as the interconnector between Slovakia and Poland (which is on the PCI-list). Interviewees tell that nowadays, interconnections with neighbouring countries are technically equipped to operate bidirectional (allowing for flow reverse). To do so, in the recent years lines, equipment and compressors have been technically upgraded to allow flow reverse, which some countries might regard as innovative but in the interviewees' eyes, this is common practice. All related measures have been implemented within the regulatory framework in force at the time of implementation, so no improvement needs could be derived.

Moreover, a chain of measures to increase efficiency and reduce CO<sub>2</sub> (e.g. more efficient compressors) are planned and carried out, which are part of a long-term operating philosophy that could be interpreted as a reaction on the NRA's focus on keeping prices low.

Unlike in other, more western EU countries, green gas, PtG etc. are said to be no issues in Central-Europe because natural gas is regarded as an environment friendly commodity as it replaces more hazardous energy sources. So, there is no need to invest in these technologies, the interviewees told us.

Even though the today applied projects are regarded as being innovative, it could be considered useful to increase support for innovative projects to ensure the application of innovative solutions also in the long term. Even when these solutions do not directly reduce TSO's costs but have wider benefits.

### **3.2.3. Regulatory practice related to security of supply**

#### **Security of supply projects and adequacy of the NRF relating to its support for these projects**

The regulation regarding security of supply is seen as adequate to generally guarantee sustainable continuity of security of supply. As already described in the section above, interviewees state to do several projects that enhance security of supply by the diversification of gas sources, increasing system flexibility etc. All related measures have been implemented within the regulatory framework in force at the time of implementation, so the interviewees did not name any improvement needs.

### **3.2.4. Illustrative specific projects**

The following projects are examples of successful innovative or security of supply projects and hence illustrate how the regulatory regime, especially regarding the financing mechanisms, works in practice.

#### **Connecting Europe Facility**

Some investment projects may be co-funded from various EU funds, e.g. the Connecting Europe Facility fund<sup>94</sup>, from which the “Poland-Slovakia Interconnection of Gas Transmission Networks”, aiming at the increase of security of supply, market integration and diversification of gas sources, project is funded, for instance. This project is included among projects of common interest pursuant to Regulation No. 347/2013 of the European Parliament and of the Council (EU) on Guidelines for Trans-European Energy Infrastructure. A study and engineering works on the project have been co-funded from the fund.

Construction works for the Poland – Slovakia Interconnector, the planned cross-border gas pipeline, from which approx. 59 kilometres will be situated in Poland and 106 kilometres in Slovakia, will also be funded from this fund (through a grant). It will be a grant in the amount of EUR 107.7 million, of which EUR 55.2 million is the share for eustream, the Slovakian gas TSO. According to the interviewees this project is treated within the regular regulatory framework but a special treatment for the operation phase shall be implemented that has already been described in Section 3.1.3.

#### **Trans - European Energy Networks Programme (TEN-E)**

In 2013, eustream received financial support from the European Union from the TEN-E<sup>95</sup> support programme for the preparation of a feasibility study for the “Polish-Slovak Interconnection of Gas Transmission Networks” project as well as for the “Modification of Turbo Machine Sets Nuovo Pignone 23 MW into DLE” project, where a conversion of a gas turbine has been performed from the technical point of view (serving as a compressor drive) with standard combustion SAC (Standard Annular Combustor) into the DLE (Dry Low Emissions) system with low values of industrial emissions produced, which is an example of applying an innovative solution.

### **3.3. Options for improvement**

#### **3.3.1. Options to improve regulatory practice**

The above discussion shows that we were able to identify one potential improvement need. Even though the today applied projects are regarded as being innovative, it could be considered useful to increase support for innovative projects to ensure the application of innovative solutions also in the long term.

##### **(i) Statutory reference to innovation**

There are no statutory powers or duties aiming at encouraging innovation. If it is deemed desirable to strengthen the incentives for the TSO to adopt new technologies, even when they do not directly reduce TSO costs but have wider benefits, a statutory reference to innovation could be included into the regulatory framework.

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<sup>94</sup> <https://ec.europa.eu/inea/en/connecting-europe-facility>.

<sup>95</sup> <https://ec.europa.eu/energy/en/topics/infrastructure/trans-european-networks-energy>.

### **3.3.2. National law mechanism(s) for implementing options**

As regards option (i) (statutory reference to innovation), we expect that this could be implemented by including such a requirement in Section 49 (6) of the AoE via Slovakia Legislative Process.<sup>96</sup>

### **3.3.3. Impact assessment**

The long-term strategic perspective on innovation mentioned in option (i) necessitates efforts and coordination between the TSO and the NRA regarding the design of this long-term perspective (e.g. the organisation of stakeholder consultations, determining the scope of the innovation needed, monitoring and evaluating of how the statutory duty is translated into the long-term perspective).

We have not encountered any specific examples of projects that have been cancelled due to the regulatory framework. For this reason, we do not expect that any of the suggested changes will result in considerable changes to investment levels. Yet, if the perceived risk of innovative projects is lowered and a long-term strategic perspective on innovation could be attained, the share of innovative projects is expected to increase.

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<sup>96</sup> In Slovakia, most of the bills, as well as their amendments, are drafted and prepared by ministries. A particular department of ministry drafts a bill and then subjects the draft to the intra-ministerial commenting procedure of other departments within the ministry. A working group of representatives from various ministries, other public institutions, professional chambers etc. might be established. When the bill is drafted, (you can find more drafting procedure here <https://www.gamcon.org/wp-content/uploads/2017/03/legislative-process-in-slovakia-1.pdf>) the bill is passed to government. After the bill is approved by the government, it is signed by the Prime Minister and the relevant minister and the bill is sent to the Parliament. In accordance with the rules of procedure of the National Council of the Slovak, bills go through three readings. The first reading involves a general debate, in the second reading the bill is discussed by the parliament committees, amendments and additions may be tabled, and these are voted on after the committee discussions are completed. The third reading is restricted to those provisions of the bill for which amendments or additions were approved on the second reading. After the third reading, the bill is voted on as a whole. For any change of AoE, it must be voted for by at least half the members present. The adopted act is signed by the President, the Speaker of the National Council and Prime Minister. Then the promulgation follows.

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## 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"> <li>• New HVDC lines (→allow to control the power flow; less expansive for long distance transport; undergrounding less complex);</li> <li>• Replacement of HVAC by HVDC lines (→less complex and less expensive; more compact design);</li> <li>• Underground cables or GIL (→ more expensive than OHL but can help improving public acceptance and accelerate the authorisation process);</li> <li>• Design of overhead line poles (→can help improving public acceptance and accelerate the authorisation process);</li> <li>• 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).</li> </ul>
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"> <li>• Phase-shifting transformers;</li> <li>• Semiconductor-based FACTS elements (including HVDC converters).</li> </ul>
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"> <li>• Purely phase-shifting generators (→offer operational flexibility and can serve to improve cost efficiency);</li> <li>• FACTS elements (→ see above).</li> </ul>
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"> <li>• Improvements in observability and controllability based on conventional sensor and actor devices;</li> <li>• Wide-area measurement systems (aiming at synchronously measuring power phasor angles at the grid nodes to improve observability);</li> <li>• Real-time dynamic security assessment tools (aiming at observing stability phenomena beyond static voltage/current measurements).</li> </ul>

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"><li>• Generation-side flexibilities (especially renewables);</li><li>• Demand-side flexibilities (DSM/DR);</li><li>• Storage components; and</li><li>• Technologies coupling the electricity sector with other sectors (gas, heat, traffic).</li></ul>



## 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"><li>• (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);</li><li>• Increase withdrawal and injection capacity in storages by incentivising investments supporting flexibility (support of gas market liquidity and security of supply level);</li><li>• Allowance of higher pressure in selected pipeline/routes (increase of flexibility of the supply side).</li></ul>
Incentivise and facilitate upgrade of biogas to the transmission system.	<ul style="list-style-type: none"><li>• Investments in upgrade of biogas to transmission system (support of gas market liquidity and security of supply).</li></ul>
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"><li>• 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).</li></ul>
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"><li>• 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);</li><li>• Enhancement of available gas supply in situation of supply crisis;</li><li>• possibility of arbitrage a price convergence between markets to support the development of the internal market.</li></ul>



### 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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