

Cross-Border Cost Allocation Decision between the Regulatory Authority for Energy (RAE) and the Energy and Water Regulatory Commission (EWRC)

FOR

**THE PROJECT OF COMMON INTEREST 3.7.1 INTERCONNECTION BETWEEN
MARITSA EAST 1 (BULGARIA) – NEA SANTA (GREECE)**

8 August 2018

INTRODUCTION

The European Union (EU) has defined a solid energy policy consisting of specific goals for its Member States, as the reduction of CO₂ emissions, the further integration of renewable energy sources and the improvement of energy efficiency. These goals can be achieved through a more integrated energy market providing Member States with access to competitive, secure and sustainable energy sources.

In this direction and according to EU Regulation No 347/2013, one of the 12 strategic priority corridors for trans-European energy infrastructure that should be implemented by 2020, is the "North - South" priority corridor electricity interconnections in Central Eastern and South Eastern Europe (NSI East Electricity), including interconnections and internal lines in North - South and East - West directions for the integration of internal markets and the use of renewable energy sources.

The Interconnection between Maritsa East 1 (BG) and Nea Santa (GR) is project no. 3.7.1 of the PCI list placed under the PCI cluster 3.7, which is part of Priority Corridor 3, North-South Electricity Interconnections in Central Eastern and South Europe ('NSI Electricity'). More specifically, according to Regulation 347/20¹, this cluster includes:

- 3.7.1. Interconnection between Maritsa East 1 (BG) and Nea Santa (GR)
- 3.7.2. Internal line between Maritsa East 1 and Plovdiv (BG)
- 3.7.3. Internal line between Maritsa East 1 and Maritsa East 3 (BG)

as amended by Regulation (EU) 2018/540 of 23 November 2017

- 3.7.4. Internal line between Maritsa East 1 and Burgas (BG)

The cluster aims to increase the Grid Transfer Capacity (GTC) at the Greece-Bulgaria border in the North-South direction by means of the construction of the new (2nd) interconnection between Bulgaria and Greece (PCI no. 3.7.1) and other enhancements in the South part of the 400kV Bulgarian transmission system. Particularly, according to ², it will increase transmission capacity (Δ GTC) by a range of 660-870 MW for the direction from north (RO+BG) to south (GR). As such the GTC will reach 1.000 MW in 2030. On the other hand, in the south to north direction, the increase in GTC (Δ GTC) is estimated to be in the range of 0-400 MW. Actually, GTC at the boundary considered is expected to reach 650 MW in 2030. Furthermore, the Project will also contribute to the increase of the volume of exchanges between the Continental Europe synchronous area and Turkey and to accommodation of additional renewables (mainly wind farms) in northeast Greece and northeast and south Bulgaria, as the wind potential in these areas is high.

It should be noted that the present decision applies explicitly to project no. 3.7.1 of PCI cluster 3.7. This project has been included in the third Union wide list of PCIs adopted by the European Commission on 23 November 2017, as in the Annex of Regulation (EU) No 347/2013. Furthermore, the project no. 3.7.1 has been integrated into the national Ten-Year Network Development Plans (TYNDP) of Greece and Bulgaria as well as in the last two ENTSO-E TYNDPs (2014 and 2016) and in the two previous PCI lists (2013 and 2015).

Investment request for Project “Interconnection between Maritsa East 1 (BG) and Nea Santa (EL)”

The Project Promoters of the new Interconnection between Maritsa East 1 (BG) and Nea Santa (EL) are the TSOs of each country, namely Elektroenergien Sistemen Operator ESO EAD from Bulgaria and Independent Power Transmission Operator (IPTO S.A., ADMIE S.A.) from Greece. In order to promote collaboration and ensure coordination on the activities for the implementation of the Project, including the project’s pre-investment studies financed by Connecting Europe Facility (CEF), the NRAs were informed in the context of the Investment Request Dossier that a Memorandum of Understanding (MOU) was signed between IPTO S.A. and ESO EAD in the fall of 2015, setting the base for the establishment of a Joint Steering Committee (JSC).

Among the roles of the JSC are the approval of the Terms of Reference for the preparation of CBA and business plan for the project, the submission of the project’s investment request to the Greek and Bulgarian NRAs and the coordination for the development of project proposals for grant financing for the Project implementation.

The Investment Request Dossier (IRD) was submitted on 1 March 2018 by the Project Promoters to the Greek and Bulgarian national regulatory authorities (respectively the Regulatory Authority for Energy and the Energy and Water Regulatory Commission, hereinafter “RAE” and “EWRC”) pursuant to the article 12(3) of Regulation No 347/2013.

² <https://www.entsoe.eu/Documents/TYNDP%20documents/TYNDP%202016/projects/P0142.pdf>

The concerned NRAs find that all required documents as per Article 12(3) of Regulation 347/2013, namely project-specific cost-benefit analysis (CBA), a business plan including results of market testing are presented and following the submission of additional clarifications the Investment Request Dossier is considered complete. The investment request also includes a proposal for cross-border cost allocation (CBCA). Additionally, RAE and EWRC have jointly evaluated the submitted IRD, taking into account the Recommendation issued by the Agency for the Cooperation of Energy Regulators (ACER) on 18 December 2015, as described in the next section of legal framework. Finally, in line with Article 12(3) of Regulation 347/2013, the concerned NRAs assure that the IRD submitted is in accordance with the ACER Recommendation in question in terms of the prior consultations of the involved TSOs and the sufficient maturity of the project. Further information about the maturity lever of the project is provided in section 1.2.

Consequently, after reviewing and assessing the investment request as presented below, the concerned NRAs have concluded that the information received was considered satisfactory and the investment request was thus considered acceptable and consequently notified this fact to ACER with letter No E-13-41-24/12.04.2018. In this context, the concerned NRAs can proceed with the issue of the CBCA decision.

Legal Framework

The legal framework of the coordinated decision between the Bulgarian and Greek NRAs is based on the following:

- I. The Regulation (EU) No 347/2013 of the European Parliament and the Council of 17 April 2013 on guidelines for trans-European Energy infrastructure and repealing Decision No 1364/2006/EC and amending Regulations (EC) No 713/2009, (EC) No 714/2009 and (EC) No 715/2009 (Regulation No 347/2013), and in particular, Article 12 thereof.
 - Regulation (EU) No 347/2013 sets a number of guidelines aiming at promoting the interconnection of the European networks. To facilitate this procedure, the above regulation introduces the concept of the Projects of Common Interest (PCI). For a project to be awarded PCI status, it needs to meet a list of criteria, i.e. significant positive impact on at least two countries, enhancement of market integration, increase of competition in the energy markets, improvement of security of supply, better exploitation of the energy infrastructures, enhancement of energy efficiency, integration of renewable energy and generally contribution to the EU energy and climate goals. In electricity sector, PCIs can include transmission, storage infrastructures and smart grids.
 - PCIs have the additional benefit of accelerated permitting granting procedures through streamlined national processes. To that end, Regulation No 347/2013 sets a number of guidelines towards this direction to ensure the timely development and inter-operability of energy networks in European Union. The framework aims to coordinate and accelerate the permit granting processes, to enhance public participation and to offer access to EU financial assistance in accordance with article 14 of the

Regulation. Furthermore, it should be noted that in order for the Project Promoters to proceed with a grant application, the project shall have received from the concerned NRAs, a cross-border cost allocation (CBCA) decision pursuant to Article 12 of the Regulation. For this purpose, an Investment Request Dossier is submitted by the project promoters to the concerned NRAs.

- II. The national legal acts of Greece (L. 4001/2011 and Transmission System Code, RAE Decision 340/2014 on Tariff Methodology).
- III. The national legal acts of Bulgaria (Energy act SG No. 38/8.05.2018, effective 8.05.2018 and Ordinance № 1 from March 14th 2017 on electricity price regulation issued by EWRC)
- IV. The Recommendation of the Agency for the Cooperation of Energy Regulators No 05/2015 of 18 December 2015 on good practices for the treatment of the investment requests, including cross border cost allocation requests, for electricity and gas projects of common interest (ACER Recommendation). According to the recommendation in question, the Investment Request Dossier must include the following documentation for the Project:
 - a detailed technical description of the project
 - a detailed implementation plan of the project, including the progress made so far
 - a short description of the status of the project permitting process in all hosting countries, including a detailed schedule (in line with Annex VI(2) of Regulation (EU) No 347/2013) and corresponding evidence
 - information about the sufficient maturity of the project
 - information regarding the TSO consultations and their outcome
 - a project-specific cost-benefit analysis consistent with the ENTSO-E methodology taking into account benefits beyond the borders of the Member State concerned
 - a business plan evaluating the financial viability of the project, including the chosen financing solution and
 - a substantiated proposal for a cross-border cost allocation between the countries that benefit from the project
- V. The ENTSO-E Guideline for Cost Benefit Analysis of Grid Development Projects of 5 February 2015 that was approved by the European Commission.

Structure of the document

The document is structured as follows. In Section 1, an overview of the project is provided, including technical description and implementation time schedule (maturity) so far. In Section 2, an assessment of the project costs is presented in terms of investment and operation costs. In Section 3, an assessment of the project benefits is outlined consisting of Socio-Economic Welfare (SEW), system losses, cross border

monetary flows (Inter TSO Compensation incorporated), contribution to European Union targets about interconnection capacity and climate objectives and benefits for the non-hosting countries. In Section 4, the Cost-Benefit Analysis evaluation is described in net present values (NPV) terms. In Section 5, firstly the commercial viability, regarding the eligibility of the project for Union financial assistance is examined and secondly, the positive externalities derived from the project are appraised, with reference to innovation, security of supply and market integration. Finally, the NRAs' cross border allocation joint decision is presented in Section 5, analyzed in national net impact, cost-sharing scheme and associated Risks of the project. Moreover, in section 7 of the current Decision special conditions on the development, monitoring and implementation of the PCI are stated and required to be fulfilled by the Project Promoters.

1. Description of the project

1.1 Technical description of the project

The Interconnection between Maritsa East 1 (BG) and Nea Santa (EL) (PCI no. 3.7.1) includes the construction of a 400kV AC overhead power line of approximately 151 km with a transfer capacity of 2.000 MVA (thermal limit) between the substations Maritsa East 1 (BG) and Nea Santa (GR). The length of the interconnector will be approximately 151 km, from which about 30 km will be over Greek territory and 121 km over Bulgarian territory.

Both TSOs that are the Project Promoters have already carried out a number of pre-investment studies necessary for the implementation of the Project. Particularly, final technical design, routing and access roads studies have been completed for both Greek and Bulgarian territories. The mentioned studies on both territories were co-funded under CEF.

Further data regarding the project maturity is provided herein in section 1.2. Furthermore, a more detailed description of the project, including information on the public consultations carried out, technical specifications and maps can be found in the

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As it already mentioned above, this project is going to increase the transfer capacity at the BG-GR borders and contribute to the safe integration of renewable energy sources in Northeast Greece and Northeast and South Bulgaria according to ENTSO-E. The achieved strengthening of the 400kV network in the area will also have a significant positive impact on the operational security of the pan-European power system.

1.2 Schedule and Maturity

The Project Promoters have provided a detailed implementation plan of the project. Table 1 provides extracts of this plan.

³ <http://projects.eso.bg/projects/>

⁴ <http://www.admie.gr/to-systima-metaforas/anaptyxi-systimatos/erga-koinoy-endiaferontos/ergo/article/2194/>

Table 1: Project implementation plan.

Detailed Implementation Plan for the Project		
Project Step	Start Date (expected)	End Date (expected)
1. Permitting process and Studies	1/1/15	1/6/19 (BG) 6/11/18 (GR)
1.1 Public acceptance, visibility, communication and transparency	1/1/15	29/3/18 (BG) 30/6/16 (GR)
1.2 Preparation of DDP, Technical Design & Studies	1/1/15	9/3/18 (BG)
1.3 EIA	1/6/15 (BG)	30/3/17 (BG)
	1/7/15 (GR)	22/2/18 (GR)
1.4 Preparation of Detailed Design – Bulgarian territory	8/2/17	16/3/18 (BG)
1.5 Detailed CBA and Business Plan (incl. CBCA)	1/11/16	25/7/17
1.6 Construction Permit	1/6/19 (BG)	
	6/11/18 (GR)	
2. IRD – Grants	1/12/17	1/2/19
2.1 IRD submission & approval	1/3/18	30/5/18
2.2 Grant application & awarding	11/6/18	1/2/19
3. Procurement – Construction – Commissioning	1/11/17 (BG)	2/1/23 (BG)
	21/5/18 (GR)	2/1/23 (GR)
3.1 Preparation of tender dossier for the selection of a construction contractor	1/11/17 (BG)	27/3/18 (BG)
	6/10/20 (GR)	6/4/21 (GR)
3.2 Land acquisition	1/4/18 (BG)	1/4/19 (BG)
	21/5/18 (GR)	5/10/20 (GR)
3.3 Construction	1/9/19 (BG)	31/12/22 (BG)
	7/4/21 (GR)	7/10/22 (GR)
3.4 Commissioning and start of operation	Beginning of 2023	

Besides the technical and routing studies referred to section 1.1 and supplementary to the information presented in the above table, several steps have been made so far that prove the project maturity:

Status of the project in Greece

- Notification of the project to the Directorate General of Strategic Investments: 20/4/2015
- Approval of the notification from the Directorate General of Strategic Investments: 29/5/2015
- Approval of the public participation plan by the Directorate General of Strategic Investments: 07/10/2015
- Approval of Environmental Impact Assessment study by the relevant ministry in Greece on the 22nd February 2018
- Land acquisition activities have been recently initiated by Greek TSO, ADMIE

Status of the project in Bulgaria

- Notification of the project to the competent authority in Bulgaria: Submission of a Notification of the project in accordance with art.10, Regulation 347/2013 by ESO EAD to the National Competent Authority (Ministry of Energy) - ESO EAD's letter No. ПМО-7501/22.12.14
- Approval of the Notification by the competent authority in Bulgaria– March 2015;
- Approval of the Concept of Public Participation by the National Competent Authority - Ministry of Energy, Bulgaria (Article 9 of Regulation 347/2013): March 2015
- Council of Ministers of Republic of Bulgaria defined the New 400 kV Maritsa East – Nea Santa Interconnector as Project of National Importance with decision of 18 July 2016
- Approval of the EIA by the Ministry of Environment and Waters, Bulgaria on 30 March 2017: Order No. 1-1/2017
- Approval of the Final DDP by the Ministry of Regional Development and Public Works: Order No.ПД-02-15-20/09.03.2018
- Prepared Detailed Design by the contractor and approved by ESO EAD's Technical Committee with a Protocol from 16th March 2018
- Full tender dossier for the selection of a contractor for the construction of the line on Bulgaria territory approved by ESO EAD's management on 27th March 2018.

Taking into account the activities mentioned above, the concerned NRAs find that the permitting procedure is in progress and mature enough and that the expected commissioning of the project is feasible.

2. Assessment of costs

This section presents the estimates of the different costs of the project by TSOs as well as their assessment by NRAs. Following the TSOs investment request, two types of costs are considered: investment costs (CAPEX) and operational costs (OPEX).

2.1 Investment costs (CAPEX)

TSOs' estimate

In Table 2, the initial CAPEX of the project per country in detail is presented, not taking into account the awarded grants for studies.

Table 2: Total Project initial CAPEX in mil. € (no grants included)

Greece	Development costs	██████
	Project management costs	██████
	Material, construction, installation and commissioning costs	██████
	Total CAPEX in the Greek territory	██████
Bulgaria	Development costs	██████
	Project management costs	██████
	Material, construction, installation and commissioning costs	██████
	Total CAPEX in the Bulgarian territory	██████
Total Project initial CAPEX (no grants included)		██████

Considering the information provided in Table 2, approximately 12% of the investments costs of the project are allocated to Greece and the rest 88% to Bulgaria. This approach has been based on the territorial presence of the Interconnection as it was jointly agreed by the Project Promoters.

As it mentioned above, grants for studies for the Project have already been awarded and are taken into account in the cost-benefit assessment. Particularly, for the time being Greek TSO has received a grant of 0,34 mil. € and Bulgarian TSO a grant of 0,31 mil. €.

In addition to the received grants for studies, in the CBA analysis is taken into consideration the implementation of the project in the condition of receiving a 50% EU grant for works from CEF (from 2019 onwards). Regarding the calculation of grants, land acquisition costs and rights of way have not been taken into account since such costs are not eligible according to the CEF terms.

Having considered the awarded (for studies) and potential grants (for works), the total (final) project CAPEX is amended as follows (Table 3).

Table 3: Total Project (final) CAPEX in mil. € (grants included)

Total (final) Project CAPEX	awarded grants for studies included	potential grants for works approved by CEF included
Greek territory	██████	██████
Bulgarian territory	██████	██████
Total	██████	██████

Moreover, the Annual Project CAPEX in mil. €, in case of a) no grants included, b) awarded grants for studies included and c) potential grants for works by CEF included respectively, are presented in the tables below.

Table 4: Annual Project CAPEX in mil. € (without grants)

Project CAPEX (without grants)	Total	<2019	2019	2020	2021	2022	2023
Greek territory	██████	██████	██████	██████	██████	██████	██████
Bulgarian territory	██████	██████	██████	██████	██████	██████	██████
Total	██████	██████	██████	██████	██████	██████	██████

Table 5: Project annual CAPEX in mil. € (awarded grants for studies included)

Project CAPEX (awarded grants)	Total	<2019	2019	2020	2021	2022	2023
Greek territory	██████	██████	██████	██████	██████	██████	██████
Bulgarian territory	██████	██████	██████	██████	██████	██████	██████
Total	██████	██████	██████	██████	██████	██████	██████

Table 6: Project annual CAPEX in mil. € (potential grants for works by CEF included)

Project CAPEX (possible grants)	Total	<2019	2019	2020	2021	2022	2023
Greek territory	██████	██████	██████	██████	██████	██████	██████
Bulgarian territory	██████	██████	██████	██████	██████	██████	██████
Total	██████	██████	██████	██████	██████	██████	██████

It must be mentioned that potential small deviations appearing in the tables 3 to 6 above, between the sums and the individual figures, are due to rounding.

NRAs' estimate

NRAs find that the total CAPEX of the project is reasonable considering the technical characteristics of the AC overhead power line and the gathered experience in similar projects developed in both countries so far, its power level and the length of the interconnection. As per the cost allocation between the two countries, NRAs agree on the cost sharing approach proposed in the context of the IRD based on the territorial presence of the interconnection. Furthermore, NRAs agree with TSOs that the selection of this approach has been made also to support a possibly timely and less complex completion of the project, since less coordination would be required.

Moreover, upward deviation up to 5% is approved by both NRAs in advance caused by the uncertainties and the final layout / construction of the project without any further approval by both NRA's.

2.2 Operation (OPEX) and maintenance costs (O&M)

TSO's estimate

After the completion of the construction and the commissioning of the Interconnection, the OPEX will be necessary for its operation, such as patrols, clearing material and general maintenance activities such as insulators and dampers replacements. These costs are presented in the Table below, separately for each territorial section of the Project. The cost allocation of the Interconnection OPEX between Greece and Bulgaria has been based on its territorial presence as well.

Table 7: Annual Project's O&M costs in mil. €

Project O&M cost	Maintenance costs	Operating costs	Total
Greek territory			
Bulgarian territory			
Total			

NRAs' estimate

NRAs agree with the undertaken approach by the Project Promoters' on the cost sharing depended on territorial criteria. Furthermore, the annual estimate of operation and maintenance costs represents approximately only around 0.2 % of the investment costs of the project, which is reasonable.

3. Assessment of benefits

The Project Promoters have presented that the CBA of the Project is in line with the "Guideline for Cost-Benefit Analysis of Grid Development Projects" document by ENTSO-E. As per ENTSO-E's Guideline, CBA consists of two basic studies:

- The "Market Studies", which are used to calculate the dispatching of generation units and the corresponding load over the years and up to 2047 (the operational lifetime of the interconnection is assumed to be 25 years) examined on an hourly

basis. The output of these studies includes the estimation of the yearly energy output of each type of generation technology for thermal and RES units as well as the corresponding generation costs and marginal prices. In addition to the above, the yearly cross border flows are also calculated. Market study outputs for the purposes of this CBA study have been provided by TSOs.

- The “Network Studies” which are used to estimate the technical resilience and safety of the system as well as its flexibility from a technical standpoint to accommodate future development scenarios, including the trading of balancing services. Through the network studies, system losses are also calculated in energy terms which are further monetized in the CBA study.

Market and network studies are performed for two “snapshot” years, namely 2020 and 2030, according to scenarios developed by ENTSO-E in its 2016 Ten-Year Network Development Plan (TYNDP). For 2020 a “best estimate scenario of expected progress” (EP2020) is used and for 2030 the studies are performed under four different scenarios (visions 2030 V1, 2030 V2, 2030 V3 and 2030 V4) encompassing different assumptions on the reduction of greenhouse gas emissions, RES development and the integration of the European energy system in accordance with ENTSO-E guidelines. Furthermore, as the envisaged commissioning date of the project is estimated at the end of 2022 (31/12/2022), the TOOT approach is applied for each discrete ENTSO-E scenario.

The output of the market and network studies is utilized as input for the calculation of the project’s benefit indicators and the performance of the CBA study. In this section, the estimates of the benefits of the project computed by TSOs as well as their assessment by NRAs are presented. Total project benefits identified under each scenario are allocated to each involved country (namely Greece and Bulgaria) and are monetized.

3.1 Socio-economic welfare (SEW)

TSOs’ estimate

SEW refers to the market integration which is characterized by the ability of a power system to reduce congestion and thus provide an adequate GTC (Grid Transfer Capacity) so that electricity markets can trade power in an economically efficient manner. This can be achieved mainly by decreasing the cost of meeting demand, improving security of supply and enabling more efficient RES integration. From an economic standpoint, the expected SEW benefit from an interconnection is driven by the potential of more low-cost generation and high willingness-to-pay by consumers in order to get access to the market. More specifically SEW consists of consumer surplus, producer surplus and congestion rent, where:

- Consumer surplus is the benefit that is enjoyed by the end users in each country because of access to lower-cost electricity.
- Producer surplus is the benefit enjoyed by the producers in each country because of larger generated quantities to address additional demand resulting from the interconnection.
- Congestion rent is the price differential between two price zones multiplied by the volume of transmitted electricity. When there is sufficient capacity between two zones, the prices converge and thus rent disappears. It must be noted that

congestion rent is equally allocated among the countries as jointly agreed by the Project Promoters. As such it is assumed that both countries have equal market power and can therefore equally exploit any price differential generated. This approach safeguards against any biased assumptions about any potential future commercial arrangements.

In the table below, the SEW benefits for both countries are presented in detail.

Table 8: SEW benefits in mil. €

SEW benefits in mil. €	EP2020	2030 V1	2030 V2	2030 V3	2030 V4
Greece Producer surplus	-123,36	-94,92	-124,06	24,74	37,66
Bulgaria Producer surplus	76,28	110,27	94,71	6,98	-9,58
Total Producer surplus	-47,08	15,35	-29,35	31,72	28,08
Greece Consumer surplus	171,02	117,11	158,08	-18,15	-28,06
Bulgaria Consumer surplus	-58,97	-85,60	-72,43	-5,96	17,34
Total Consumer surplus	112,05	31,51	85,65	-24,11	-10,72
Congestion rent	-26,72	-25,69	-26,57	-1,26	1,53
Grand Total	38,25	21,17	29,73	6,35	18,89

It must be mentioned that potential small deviations appearing in the table above, between the sums and the individual figures, are due to rounding.

Derived from the conducted analysis in the submitted IRD, in the scenarios EP2020, Vision 1 and Vision 2 the predominant power flow direction is from North to South (Bulgaria to Greece), since the Bulgarian system is a lower priced area. The transfer capacity increase considered in ENTSO-E analysis of TYNDP 2016 for the new project in the BG->GR direction is around 700MW. Since the expensive gas generation is replaced by cheaper electricity imports, the average marginal price in Greece (importing country) is decreased. Furthermore, the average marginal price in Bulgaria (exporting country) is increased, due to the increase of domestic electricity production. This fact, as it is confirmed in Table 8, results in an increase of consumer surplus in Greece and producer surplus in Bulgaria.

On the other hand, for Vision 3 and Vision 4, due to the lower gas prices, the much higher CO₂ prices assumed and the very high amount of RES installed in Greece, the situation is reversed and the predominant power flow direction is from South to North (Greece to Bulgaria). The transfer capacity increase considered in ENTSO-E analysis of TYNDP 2016 for the new project in the GR->BG direction is initially around 80MW. In both Visions 3 and 4, since Greece is an exporter average marginal price is slightly increased by 1% due to the increase of electricity production. For Bulgaria, a slight average marginal price increase (<1%) appears in Vision 3 and a slight decrease of 1% in Vision 4, due to the replacement of domestic generation from cheaper imports from Greece. These changes, as presented in Table 8, result in an increase of producer surplus in Greece and Bulgaria in Vision 3 and an increase of producer surplus in Greece and consumer surplus in Bulgaria in Vision 4.

It should be noted that the aforementioned results arise from the assumptions adopted in each scenario, regarding mainly the fuel and CO₂ prices as well as the anticipated further installation of renewable energy capacities and the projected electricity demand in both countries.

NRAs' estimate

NRAs confirm that the methodology used for estimating the SEW benefits complies with the provisions of ENTSO-E's "Guideline for Cost-Benefit Analysis of Grid Development Projects". Furthermore, NRAs consider a positive element for the further evaluation of the IRD the fact that the SEW benefits are positive for all the scenarios, ranging from 6,35 to 38,25 mil. € (see Table 8).

3.2 System losses

TSOs' estimate

As mentioned above, network studies were carried out and system losses are calculated in energy terms. The methodology used aims to determine the effect of the construction and operation of the new Interconnection between Greece and Bulgaria to the transmission system losses of the affected power systems. The output of this calculation is monetized under each scenario using the corresponding weighted average marginal price (€/MWh) for each country. This approach has been jointly agreed by the Project Promoters and is in line with the applicable regulatory framework in both countries. In this way, the impact of the Interconnection on the transmission system losses of the power systems of Greece and Bulgaria can be assessed. System losses is an indicator of energy efficiency and it is correlated with SEW.

In the table below, the monetized benefits of system losses for both countries are presented.

Table 9: Benefits of monetized losses in mil. €

Benefits of monetized losses (in mil. €)	EP2020	2030 V1	2030 V2	2030 V3	2030 V4
Greece	████████	████████	████████	████████	████████
Bulgaria	████████	████████	████████	████████	████████
Total	████████	████████	████████	████████	████████

It must be mentioned that potential small deviations appearing in the table above, between the sums and the individual figures, are due to rounding.

NRAs' estimate

NRAs confirm that the methodology used for estimating the monetized benefits of system losses complies with the provisions of ENTSO-E's "Guideline for Cost-Benefit Analysis of Grid Development Projects" and the national regulatory practices. Additionally, NRAs assess that the approach agreed by the Project Promoters, regarding the average marginal price of electricity weighted by the demand of each country that was used for each "snapshot" year, is adequately reasonable, with respect

to the monetization of losses. Furthermore, NRAs applaud the fact that the benefits of monetized losses are positive (except vision 2030 V3) is in line with NRA's approach over better and more efficient exploitation of the networks, even though their significance is minor due to their low values (see Table 9).

3.3 Cross-border monetary flows – Inter TSO Compensation (ITC)

TSOs' estimate

Pursuant to ENTSO-E CBA Methodology and ACER Recommendation No 5/2015, on the calculation of national net impacts, cross-border monetary flows are taken into consideration (as benefits or costs, revenues or payments). In this case, the cross-border monetary flows consist of expected revenues (or payments) of the ITC mechanism (positive or negative) and the awarded non-national grants (positive).

According to the EC Regulation No 838/2010, the Inter-TSO-Compensation (ITC) mechanism provides compensation to the TSOs of the countries involved for the costs of hosting cross-border monetary flows of electricity including the access to such an interconnected system. More specifically, it provides compensation for the costs of losses incurred by national transmission systems because of hosting cross-border flows of electricity, and the costs of making infrastructure available to host cross-border flows of electricity.

Regarding Maritsa East 1 – Nea Santa interconnection, it should be noted that potential national monetary transfers such as payments of taxes and national grants are not considered as they are offset inside each country. Additionally, the expected congestion rents are also considered as cross-border monetary flows, however they have already been counted in the SEW benefit.

The Inter-TSO Compensation has been calculated by the Bulgarian TSO (ESO-EAD) and agreed with IPTO S.A., and is constant for all scenarios examined, as it is depicted in the Table 10.

Table 10: Inter – TSO – Compensation (ITC) benefits in mil. €

ITC benefits (in mil. €)	EP2020	2030 V1	2030 V2	2030 V3	2030 V4
Greece	██████	██████	██████	██████	██████
Bulgaria	██████	██████	██████	██████	██████
Total	██████	██████	██████	██████	██████

It must be mentioned that potential small deviations appearing in the table above, between the sums and the individual figures, are due to rounding.

NRAs' estimate

NRAs accept that the estimate of cross-border monetary flows resulting in ITC benefits relies on ENTSO-E CBA Methodology and ACER Recommendation No 5/2015. Moreover, NRAs deem that the calculation of TSOs about constant ITC benefits for all scenarios conducted is satisfactory. In any case, the amount of ITC benefits is of minor importance and they do not affect notably the total benefits.

3.4 Contribution to the target 10% network connectivity by 2020

Regulation No 347/2013 aims to develop market integration and security of supply (SoS). In this context, the Regulation sets 10% network connectivity for EU member states as a target for market integration. The evaluation in Commission's COM(2017) 718 final dated 23.11.2017⁵ to the European Parliament and the Council, EESC and CoR on strengthening the European energy networks indicates significant contribution of PCI 3.7.1 towards the common interconnectivity targets as a whole and for Bulgaria in particular. As of 2017, Bulgaria has 7% interconnectivity and Greece has already achieved the European target with its electricity connectivity currently estimated at 11%. With the second interconnector between Bulgaria and Greece, Bulgaria's connectivity will reach 18% and that of Greece will increase to 15% by 2020.

Both national regulatory authorities acknowledge that, being a PCI, this project has major importance for achieving the electricity interconnection target by 2020 and beyond. Although the implementation schedule foresees that this PCI will be commissioned by the end of 2022, its contribution to the common targets remains significant.

3.5 Contribution to the EU energy and climate targets

Regulation No 347/2013 aims at accelerating the refurbishment of existing energy infrastructure and the deployment of new energy infrastructure to achieve the Union's energy and climate policy objectives, consisting of completing the internal market in energy, guaranteeing SoS, reducing greenhouse gas emissions by 20%, increasing the share of renewable energy in final energy consumption to 20% and achieving a 20% increase in energy efficiency by 2020. At the same time, the Union has to prepare its infrastructure for further decarbonisation of its energy system in the longer term towards 2050. The contribution of this PCI to internal market integration and SoS is discussed and assessed in the remaining paragraphs of the present decision. This includes an evaluation of the new interconnection's impact on climate, renewable integration and energy efficiency.

TSOs' estimate

The prepared by the two Project Promoters Cost-Benefit Analysis calculates the impact of the new interconnection on electricity generation and greenhouse gas emissions for each assumed scenario.

The results for all considered scenarios show variation of CO₂ emissions resulting from electricity generation in the range between (– 0.38) and (+ 0.08) mt CO₂ for Greece and between (– 0.05) and (+ 0.31) mt for Bulgaria. For a total of three scenarios, the emissions are reduced by (+ 0.05) mt CO₂ and for two scenarios there is an average increase by (+ 0.03) mt CO₂. The CBA also evaluates how the new interconnection will affect renewable generation, showing an average annual increase between 0.01 TWh and 0.08 TWh for Greece. In this direction and as it is previously stated, by means of the Project significant impact regarding the integration of renewables in the grid and consequently in the market is expected for the Bulgarian side as well. In addition, the TSOs have also calculated the effect on transmission losses which will decrease in both countries in the range between 4.56 MWh and 22.02 MWh on an annual basis in four

⁵https://ec.europ.eu/energy/sites/ener/files/documents/communication_on_infrastructure_17.pdf

of the considered scenarios. An average annual increase of transmission losses by 13.24 MWh for both countries is only observed in one scenario.

NRAs' estimate

Both national regulatory authorities acknowledge that the new interconnection will contribute to achieving the targets set forth in Regulation No 347/2013, i.e. an optimal utilisation of energy infrastructure, increased energy efficiency and integration of distributed renewable energy sources and promoting sustainable development. The project in total will result in reducing the amount of electricity needed to cover transmission losses, thus increasing energy efficiency and cutting down on emissions.

3.6 Benefits to Non-hosting Countries

In line with Article 12, paragraph 3 of Regulation (EU) No 347/2013 and ACER Recommendation No 5/2015 of 18 December 2015, the investment request for CBCA shall be submitted after having consulted the TSOs from Member States to which the project provides a significant net positive impact.

TSOs' estimate

The CBA results show an insignificant impact on third countries, including the member states Romania and Italy and non-member states FYROM, Serbia, Albania and Turkey. Moreover, the analysis also suggests that the benefits beyond Bulgaria and Greece are distributed among all interconnected neighboring countries and their corresponding share in all considered scenarios is not significant and cannot be calculated. Romania and Turkey are expected to experience the biggest portion of this impact, but it remains low and falls within the limits of calculation uncertainty. The Project Promoters have therefore concluded that the capital costs should only be allocated between Bulgaria and Greece.

Furthermore, the Project Promoters consulted the project specific CBA with the Romanian (Transelectrica) and Italian (Terna) TSOs as Member States to which the new Interconnection between Maritsa East (BG) and Nea Santa (EL) may provide a significant net positive impact. Transelectrica and Terna have officially confirmed that the used approach is consistent with ENTSO-E methodology and that the amount of benefits for Romania and Italy is not significant for the two countries to financially contribute to the implementation of the project.

NRAs' estimate

Both NRAs expect that the new interconnector will have a positive net impact on the regional power system. Nevertheless, due to the level of uncertainty in all scenarios and evaluations, the net benefits to countries beyond Bulgaria and Greece can neither be defined as considerable nor allocated to each one of them. Both NRAs agree with the TSO's conclusion that the project implementation costs should be allocated between Bulgaria and Greece as these two countries will enjoy significant net benefits. Consultations with the neighbouring TSOs as Member States (namely Romania and Italy) to which the new Interconnection may provide a significant net positive impact also confirm that none of the considered scenarios contains data and calculations

suggesting significant net impact on any of them and therefore none of these countries should be invited to co-finance the realization of the new interconnection.

4. Project-specific Cost-Benefit Analysis – Net Present Value

The submitted by ESO EAD and IPTO S.A. investment request includes calculations of the Net Present Values (NPVs) for Greece and Bulgaria as well as the Economic Net Present Value (ENPV) in all four scenarios according to ENTSO-E TYNDP 2016. Both NRAs accept the calculation methodology used for CBCA in which: 1) producer and consumer benefits are calculated separately for each country; 2) process costs (transmission losses) (in MWh) are first allocated to Greece and Bulgaria in the network studies and then monetized by the weighted average marginal price per country; 3) ITC revenues are calculated by the corresponding TSOs, and 4) congestion revenues are equally distributed between the two countries assuming that both have the same market power and are thus equally able to investigate generated price differentials.

The CBA shows that the project has a positive ENPV in all four scenarios ranging from 88 mil. € and 361 mil. €, with an average value of 239 mil. €. The average Economic Internal Rate of Return (EIRR) and the Economic Benefit/Cost (EB/C) are 26% and 4.6% correspondingly.

Both NRAs consider that it is reasonable to use the average value from all scenarios in order to give the same weight to each one of them reflecting the fact that none of the scenarios is seen as more likely than any of the remaining ones⁶. Also, the NRAs take into account the fact that Visions 2030 represent feasible conditions selected from a wide range of possible alternatives rather than forecasts, meaning that the actual development will most likely fall within the range set in the Visions.

CBA Results

Table 11: Total benefits per country

Benefits in NPV (mil. €)	SC 1	SC 2	SC 3	SC 4	Average
Greece	159 (47%)	283 (66%)	125 (81%)	178 (58%)	186 (61%)
Bulgaria	178 (53%)	146 (34%)	30 (19%)	127 (42%)	120 (39%)
Total	337	429	155	305	306

The benefits for Greece range between 125 mil. € and 283 mil. €, with average present value (PV) from the four scenarios for Greece standing at 186 mil. € (61%). The benefits for Bulgaria range between 30 mil. € and 178 mil. €, with average present value of 120 mil. € (39%). The CBA results indicate that the new interconnector will generate benefits to both countries.

A summary of the key economic parameters of the project, including its ENPV and EB/C, is given in the following table.

⁶ The wide range of hypotheses referred to as Visions, including prices of fuels and CO₂, RES integration, etc., as well as various values deriving from the new interconnector and its impact on cross-border transfer capacity, represents a single average value taken as an input for calculation of the net benefit to those member states in which the project is implemented.

Table 12: ENPV of the Project

ENPV (mil. €)	SC 1	SC 2	SC 3	SC 4	Average
Present value of benefits	337	429	155	305	306
PV of CAPEX	-65	-65	-65	-65	
PV of OPEX	-2	-2	-2	-2	
ENPV	270	361	88	237	239
EB/C	5.0	6.4	2.3	4.5	4.6

The project's profitability is calculated as the ratio between discounted benefits and discounted costs and ranges from 2.3 to 6.4, where the average value of this factor per scenario is 4.6, which confirms the above conclusion that the economic benefits exceed the economic costs and the project therefore generates social welfare in all scenarios.

To that effect, both NRAs acknowledge the potential common benefits from this project as estimated in the CBA. These demonstrate that the project is economically viable and will contribute to the EU energy policy goals, including the development of Internal Energy Market, and meets the criteria set out in Article 4 of Regulation (EU) No 347/2013.

5. EU financial assistance request

5.1 Eligibility of the Project for Union financial assistance – commercial viability

Pursuant to Article 14 of Regulation No 347/2013, PCIs for construction of high-voltage interconnection lines are eligible for Union financial assistance provided that 1) the project specific cost-benefit analysis provides evidence concerning the existence of significant positive externalities, such as security of supply, solidarity or innovation; 2) the project has received a cross-border cost allocation decision, and 3) the project is commercially not viable according to the business plan and other assessments carried out, notably by possible investors or creditors or the national regulatory authority.

Significant positive externalities

a) Innovation

There is currently one interconnector between Bulgaria and Greece whose transmission capacity is used at over 90% year-round for commercial exchanges. Apart from that, 1500 megawatts are withdrawn from the market during scheduled annual maintenance of the existing interconnector. This leads to negative impacts on consumers in Greece and producers in Bulgaria and deprives both TSOs from operational capabilities to guarantee voltage and frequency stability due to constantly increasing power supply from renewables that are well known as being highly volatile. The new interconnection between the two member states will not only lead to increased commercial exchange but will also create additional cross-border potential for deployment of new innovative technical solutions related to the fourth clean energy package, such as: 1) RES balancing platforms; 2) energy storage systems, 3) demand-side management (DSM); 4) cross-border dispatch; 5) market coupling and new market products platforms; 6) hybrid flexible systems, etc.

In this respect, the NRAs consider the new interconnector as a prerequisite and driver for innovations in regional system management as well as an enabler for integration of a constantly increasing share of new production, storage and demand-side technologies.

b) Security of supply

The new interconnection with transfer capacity of 2000 MVA will reinforce the regional 400 kV network and facilitate the accommodation of renewable electricity originating from Southeast Greece and South Bulgaria. The project crosses the BG-GR border directly and increases the NTC for commercial exchange between these two countries. It also accelerates market integration and boosts competitiveness and system resilience. Based on the project-specific CBA, this PCI will result in achieving the meeting objectives:

- Respect the security criteria during significant electricity exchange between Bulgaria and Greece and sustain the volume of trade in maintenance and emergency conditions;
- Reduce the load and increase the security of internal transmission lines in Bulgaria and Greece during normal, maintenance and emergency conditions.

Both NRAs take due account of the contribution of this PCI towards the targets set out in Regulation No 347 for ensuring SoS in Member States, including the tackling of security limitations caused by the lack of adequate interconnections.

c) Solidarity and market integration

The project will accelerate market coupling and increase competitiveness. Furthermore, a second interconnector between Bulgaria and Greece will serve towards the elimination of situations by which the NTC between the two countries is reduced to zero during scheduled or emergency disconnection of the existent 400 kV tie line, i.e. it will create conditions of uninterrupted bilateral commercial exchanges.

The average CBA results show that 61% of the economic benefits are for Greece and 39% are for Bulgaria. At the same time, most of the new line will be on Bulgarian territory (122 km or 81%) and only small section of it will be in Greece (29 km 19%), which results in higher CAPEX and OPEX for the Bulgarian TSO. For the first three scenarios considered in the project-specific CBA, the increased flows of electricity from Bulgaria to Greece will lead to higher consumer surplus and lower retail cost of the electricity in Greece, with considerable consumer benefits ranging between 117 mil. € and 171 mil. €. Also calculated for the same three visions are the benefits for Bulgaria which create more opportunities to integrate generators, including RES, thus increasing producer benefits whose range is estimated to fall between 76 mil. € and 106 mil. €.

For the third scenario, as the project demonstrates low impact on load flows, the effect on consumers and producers is consequently lower.

For the fourth scenario, due to low export from Greece, the retail prices in Greece are expected to decrease while the benefits for Bulgarian consumers will increase by 17 mil. €, with the losses for Bulgarian producers reaching 10 mil. €. At the same time in

Greece, due to increase of retail prices, the losses for consumers are estimated to exceed 28 mil. €.

Nevertheless, both TSOs have agreed to cover the direct costs for this project proportionally to its corresponding territorial distribution, which the NRAs deem to be in line with the principles set forth in Regulation No 347/2013 for interconnecting networks across borders, in order to make solidarity between Member States operational, to provide for alternative supply or transit routes and sources of energy and to develop alternative energy sources.

5.2 Conclusions on the Business Plan and financial gap eligible for EU funding

In the Business Plan (BP) concerning their Investment Request, both TSOs have analyzed the financial viability of this PCI. The new interconnection will be built and operated by both TSOs and the related costs will be recovered through the network tariffs in Bulgaria and Greece. Each TSO shall perform all necessary activities to build and operate its own section of the interconnection. The assets acquired by each TSO as a result of this investment will thus be included in its relevant Regulatory Asset Base (RAB).

In this context, the calculation of the eligible incomes for each TSO and their allocation in the network tariffs reflect the relevant costs and rates of return in accordance with the applicable national regulatory frameworks in Greece and Bulgaria.

Both TSOs have investigated and presented the available funding options for new energy infrastructure, including: equity financing; external funds from commercial credit institutions; external funds from the European Fund for Strategic Investments (EFSI), and grant from the Connecting Europe Facility (CEF).

The financial analysis presented in the BP investigates the return on investment regardless of the funding sources and as well as for the return of equity, which takes into account all sources of financing except for the grant for its construction amounting to 50%.

The results show that the investment has a negative Financial Net Present Value (FNPVI) (-24,83 mil. €) and positive Financial Rate of Return (FRR) at a discount rate of 4%. This indicates that the project is not viable under the current national regulatory frameworks and therefore requires partial external funding as set forth in Regulation 347/2013 on guidelines for trans-European energy infrastructure.

Both TSOs have presented results with 50% grant funding by CEF showing that the Financial Net Present Value of capital (FNPVC) is higher than the FNPVI (-15,09 mil. €) but remains negative.

In this case, the Project is foreseen to be funded by two sources (in total):

- 43% through CEF grants (regarding both studies and works; specifically for the works, the assumed grants correspond to 50% of the eligible construction costs);
- 57% by equity placements (placements of the involved TSOs).

Although the FNPVC with 50% grant funding by CEF is negative and the FRR falls short of the target discount rate of 4% in real terms according to Appendix No I of ACER Recommendation 5/2015, both TSOs define this project as desirable and needed.

At the same time, the financial investigation contained in the BP indicates positive net cash flows for the reference period of 25 years.

The TSOs have estimated how an investment with 50% grant funding would affect the current network tariffs in both countries. The present average tariff in Greece is 3.85 €/MWh and the transmission tariff impact represents an increase of 0.01 €/MWh or 0.26% based on the real Weighted Average Cost of Capital (WACC) 7.3% as it is set for the Greek TSO income for 2017 (RAE's Decision No 572/2014). Considering the usage of real WACC set for the year 2018 of 7.0% (RAE's Decision No 235/2018), the impact on consumers' tariffs is even smaller (0.008€/MWh). In every case concerning the Greek part of the Project, the WACC will be adjusted in line with RAE's relevant Decisions over the annual revenue of IPTO.

The present average tariff in Bulgaria is 3.76 €/MWh and the transmission tariff impact represents an increase of 0.04 €/MWh or 1%. Also included are calculations of the net effect for Bulgaria and Greece reflecting the corresponding net benefits, ITC and impact on national tariffs. Greece has a positive net effect of 1.19 €/MWh for consumers. Bulgaria has a positive net effect for producers and it also stands at 1.19 €/MWh.

Pursuant to Regulation No 347/2013, when performing cross-border cost allocation, national regulatory authorities should promote a regulatory framework attractive to investment in networks, with tariffs set at levels consistent with financing needs and the appropriate cost allocation for cross-border investments, while enhancing competition and competitiveness and taking account of the impact on consumers.

When deciding on cross-border cost allocation, national regulatory authorities should ensure that its impact on national tariffs does not represent a disproportionate burden for consumers.

Such decision of national regulatory authorities should also take into account the impact of investment cost on network tariffs and seek to ensure that it is minimized. Considering the TSOs' investment proposal with 50 % external funding by CEF, the national tariffs in Bulgaria and Greece will increase compared to those currently in force by 1.06% and 0.26% correspondingly.

As per implementation schedule and annual breakdown of capital costs in the BP, most of the estimated total costs will be spent for building the Bulgarian section of the new interconnection in the period between 2022 and 2023. The amount of capital costs for implementation of this PCI on an annual average basis is equal to 40.12% of the total capital costs that Bulgaria intends to spend according to its national TYNDP 2018-2027.

When deciding on a TSO's network development investment plan as well as on cross-border cost allocation for PCIs, national regulatory authorities should consider the impact of these costs on tariffs paid by consumers.

For the considered options regardless of funding sources, the capital costs for this PCI in reference period 2022 – 2023 represent 40.12% of the total investment program of

the Bulgarian TSO. For the option with 50% funding by CEF, the capital costs for same reference period represent 20.06% of the total investment costs.

According to the national regulatory authorities of both countries, TSOs are advised to use grant funding of 68% of the eligible costs for construction, which would in turn have the following positive effects:

- Minimizing the impact of costs on national network tariffs, i.e. tariff increase in Bulgaria is be reduced to 0.03 €/MWh or 0.8% as compared to the current tariffs. For Greece, the increase is 0.004 €/MWh or 0.1% as compared to the current tariffs.
- Mitigating the risk of failing to meet Bulgarian TSO's investment program for reference period 2022 – 2023 by reducing the average share of capital costs for construction to 6.56% of the total capital costs for the two reference years;

6. Decision on cross-border cost allocation

The TSOs' proposal for CBCA puts forward an approach based on the territorial distribution of the interconnection, as this would enable faster and less complex implementation of the project due to reduced need for coordination between the countries involved, notably:

- A cross-border cost allocation based on benefits would require to establish a separate legal entity tasked to implement this investment (project company) since in such case the Regulated Asset Base (RAB) would differ from the investment to be covered by either TSO or they would have to arrive at complex regulatory arrangements.
- If a project company is set up, it should be funded by the TSOs of Bulgaria and Greece in order to recover the investment costs, OPEX as well as to ensure RoI. The existence of such project company suggests significant difficulties in terms of financial structures, legal and tax matters and the need to sign a service procurement agreement between the two TSOs, making this type of investment much more complex;
- Moreover, the external funding option involves both TSOs, which means that both TSOs will have to synchronize their requests for such funding;
- A cross-border cost allocation following the territorial principle would allow TSOs to include their respective TYNDPs in the project without the necessity for considerable coordination of activities with neighbouring TSOs and NRAs and without having to take additional administrative burden potentially affecting the implementation deadlines;
- There would be no need for the two countries to harmonize their regulatory frameworks or to adjust or modify their regulatory regime since the structure of revenues and other parameters of the interconnector will follow the current regulatory regime in each of the countries hosting this project.

The TSOs investment request includes data on the cost allocation per country as shown in the table below:

Table 13: Annual Investment Costs (mil. €)

Investment Costs (mil. €)	Total	<2016	2017	2018	2019	2020	2021	2022	2023
Greece	████	████	████	████	████	████	████	████	████
Bulgaria	████	████	████	████	████	████	████	████	████
Total	████	████	████	████	████	████	████	████	████

Having assessed the CBCA approach proposed by both TSOs, the corresponding NRAs agree and acknowledge that the territorial principle for cross-border cost allocation is the optimal solution and therefore should be applied for this project. Pursuant to this approach, the CAPEX incurred for each national territory will be allocated to the country it belongs to.

The total investment costs for building the new interconnection are 79.10 mil. €, of which 9.74 mil. € or 12% should be borne by IPTO S.A. and 69.36 mil. € or 88% should be borne by ESO EAD. Max deviation approved by both NRA's +5% is derived from the final lay out of the project and additional costs from the construction of the project.

The NRAs have assessed the amount of CEF funding proposed by both TSOs, which is 33,20 mil. € or 50%, as well as the impact of investment costs on network tariffs per country and on the overall investment program of ESO.

The NRAs recommend that Bulgaria and Greece shall use CEF funding of 45,15 mil. € or 68%, i.e. 6,20 mil. € for Greece and 38,95 mil. € for Bulgaria, in order to minimize the negative impact on consumers and TSOs.

Ultimately, the Project is foreseen to be funded by two sources (in total):

- 58% through CEF grants (regarding both studies and works; specifically for the works, the assumed grants correspond to 68% of the eligible construction costs);
- 42% by equity placements (placements of the involved TSOs).

Treatment of the associated Risks of the project in the context of the CBCA Decision

According to Regulation 347/2013, the concerned NRAs should examine whether the Project Promoter of a PCI incurs higher risks compared to risks normally incurred by an infrastructure project that is considered comparable in terms of Development, Construction, Operation or Maintenance. In this context, ACER has published its ⁷ and subsequently both NRAs of Greece and Bulgaria have published corresponding guidelines for the treatment of ⁸.

In order to assess the impact on the ENPV in case of variations of Project's commissioning date (time overrun risk) and CAPEX (cost overrun risk), sensitivity

⁷https://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Recommendations/ACER%20Recommendation%2003-2014.pdf

⁸http://www.rae.gr/site/categories_new/pci/info/300915.csp?viewMode=normal
http://www.dker.bg/files/DOWNLOAD/Metodika_Reg_347_EN.pdf

analyses have been performed by the TSOs in the submitted CBA. Particularly, for the commissioning date, a year prior and up to three (3) years after the base case has been tested and for the CAPEX, a range of $\pm 20\%$ variation from the base case values has been examined. The sensitivity analysis showed that CAPEX and the commissioning date are not considered critical parameters for the sustainability of the Project, since the Project's ENPV remains positive in all scenarios examined.

NRAs' estimate

Concerning the cost overrun risks, the fact that the Project Promoters are also the TSOs of the involved countries reduces the probability of manifestation of such a risk, since their experience in similar infrastructure projects on the hand, the development of which is among their key responsibilities, and the maturity of the Project in question on the other allows them to reliably predict the costs associated with the project. In this direction, the risk of inefficiently incurred costs is mitigated as well. However, in any case, any potential additional cost not exceeding the 5% of the approved total CAPEX clearly and with tangible data justified by the Promoters will be recovered following a relevant decision / approval by both Regulators after a request of both TSOs through the transmission tariffs after the project's commissioning.

When it comes to time overrun risks, the permitting process has already initiated in both countries and is on track to complete as per the schedule, as it is mentioned in section 1.2. On a more legal perspective although public tendering processes could potentially cause delays in the procurement of such Projects and consequently in the beginning of its construction, the Project Promoters, being TSOs, have executed several similar procurement processes and their experience can mitigate such a risk. In addition, the routing study could be easily altered to overcome land acquisition burdens where significant delays may be caused. Finally, the fact that the project is eligible for accelerated permitting processes due to its PCI status further mitigates the probability of such a risk.

To conclude, considering that the nature of the Project is not characterized as highly complex, the Project Promoters are the involved TSOs, the technology to be used is well-known and the fact that the capital investment required is moderate in terms of both countries' current Regulatory Asset Base, potential risks for the Project have been significantly mitigated.

7. Special Conditions – Terms

7.1 Technical configuration - transfer capacity

The present Decision concerns only the specific proposed technical configuration and transfer capacity of the Project. Any alterations are subject to the NRAs' approval.

7.2 Costs

Open tendering procedures must be followed for the implementation of the Project. The present Decision concerns only the proposed technical interconnection and related projects and services in the design, construction and delivery phase, the cost of which cannot exceed the amount prescribed in section 6 of the Decision.

Costs related to a different technical approach shall not be recognized without the prior approval of the NRAs and in any case, may not exceed the amount specified above 83,06 mil. € (deviation of initial CAPEX up to 5%). No adjustment of compensation payment shall be carried out in case the actual investment cost as of the commissioning date exceeds the cost indicated above.

7.3 Minimum availability

The Promoters guarantee that the Project is constructed according to internationally approved standards and certifications, in order to maximize infrastructure availability.

7.4 Obligation for providing information

The Promoters have the obligation to inform the NRAs of the Member-States concerned, on the progress of the Project, with a six months' detailed Report.

7.5 Assignment of rights

The Promoters shall not assign the rights and obligations arising from the present Decision, without a prior approval by the competent NRAs.

7.6 Schedule of implementation

The present decision is valid only if the Promoters complete the Project within the timeframe provided by the Investment Request which is considered binding. In case that the observation of the deadlines of the Project is objectively impossible, the Promoters must inform the competent NRA, without delay, requesting an extension of the time period during which the force majeure is occurred. The request shall be submitted at least ten (10) days following the occurrence of the said force majeure.

7.7 Unbundling and conflicting interests

As stipulated by the Regulation (EU) 714/2009, the Project Promoters shall not operate fully by themselves, or through subsidiaries, in any other energy generation and supply activity, or be a shareholder in a company with a view to engaging in any energy generation and supply activity, or to have conflicting interests with the implementation of the Project, or its operation.

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Assoc. Prof. Ivan N. Ivanov, PhD

*Chairman
Energy and Water Regulatory Commission*

.....
Dr. Nikos Boulaxis

*President
Regulatory Authority for Energy*