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**OPINION OF THE AGENCY FOR THE COOPERATION OF ENERGY
REGULATORS No 04/2016**

of 23 March 2016

**ON THE NATIONAL TEN-YEAR ELECTRICITY NETWORK DEVELOPMENT
PLANS PURSUANT TO ARTICLE 8(11) OF REGULATION (EC) NO 714/2009**

THE AGENCY FOR THE COOPERATION OF ENERGY REGULATORS,

HAVING REGARD to Regulation (EC) No 714/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (EC) No 1228/2003¹, and, in particular, Article 8(11) thereof,

WHEREAS:

- (1) Article 8(11) of Regulation (EC) No 714/2009 tasks the Agency for the Cooperation of Energy Regulators (“the Agency”) with providing an opinion on the national ten-year network development plans (the “NDPs”)², to assess their consistency with the Community-wide ten-year network development plan (“the EU TYNDP”).
- (2) National regulatory authorities (“NRAs”) have provided the Agency with essential information for this Opinion: information on national components of transmission investments³ (for which data collection⁴ was completed on 29 February 2016), information and data related to the input and the methodologies used for the development of the NDPs, as well as key features of their respective NDPs, provided through the online questionnaire and completed on 9 December 2015.

¹ OJ L 211, 14.8.2009, p. 15.

² As mentioned in the Opinion of the Agency of 4 April 2014 on the national ten-year electricity network development plans

(http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Opinions/Opinions/ACER%20Opinion%2008-2014.pdf), the Agency considers all relevant national network planning instruments, even if they were referred to with a different title, e.g. investment plan, as “national ten-year network development plans” pursuant to Article 8(11) of Regulation (EC) No 714/2009 (hereinafter altogether “national development plans”).

³ In this Opinion, a “national component of a transmission investment” means a national transmission investment item or part of it pertaining to one country (e.g. part of a line or cable interconnecting two or more jurisdictions, a line or substation or other equipment geographically located in one country etc.).

⁴ Information was provided through the ACER Database.

HAS ADOPTED THIS OPINION:

The aim and objective of this Opinion is to assess the consistency between the EU TYNDP 2014⁵, published by the European Network of Transmission System Operators for Electricity ("ENTSO-E") and the NDPs, outlining similarities and differences, without necessarily qualifying the possible differences as inconsistencies, pursuant to Article 8(11) of Regulation (EC) No 714/2009.

The EU TYNDP and the NDPs should be seen as partly overlapping and interlinked sources of information and analyses, provided the information is available in a transparent way and allows for a comparison of their respective content and results. The Agency thus reaffirms its recommendations regarding the transparency of NDPs⁶, in particular in relation to:

- the use of a coding system (unique for each investment);
- the cross-referential mapping with the codes from the EU TYNDP and from the Regional Investments Plans;
- the information on commissioning dates;
- the information on the status of projects;
- the information on the increases in net transfer capacity;
- project costs.

According to the responses received to the questionnaire and by analysing the EU TYNDP 2014, the following areas most commonly display differences or represent risks of divergences between the NDPs and the EU TYNDP:

- the time span between the preparation of NDPs and the preparation of the EU TYNDP and the potentially different frequency of publication;
- the methodological differences regarding the definition of scenarios and the cost-benefit analysis (CBA) methodologies between the NDPs and the EU TYNDPs⁷;
- the scenarios and study horizons used for the assessment of projects of cross-border relevance;
- the estimated value of benefits and costs;

⁵ ENTSO-E, "10-Year Network Development Plan 2014", corrigendum version published by ENTSO-E in December 2014; https://www.entsoe.eu/major-projects/ten-year-network-development-plan/tyndp-2014/Documents/TYNDP%202014_FINAL.pdf

⁶ As already mentioned in ACER Opinion 08/2014, Section 4. http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Opinions/Opinions/ACER%20Opinion%2008-2014.pdf

⁷ Still work in progress.

- the estimated increase in cross-border capacities;
- the status, expected date of commissioning and progress of infrastructure projects.

The Agency believes that a significant part of these commonly displayed differences or risks of divergences between the plans could be easily identified through transparent publishing of the input data and the assessment results, as well as by systematic, consistency checks, performed by TSOs, on all the above dimensions in the NDP framework. The Agency, therefore, recommends that any differences in approach or in values between the EU TYNDP and the NDPs are detected and signalled by the concerned TSOs in their respective NDPs.

In addition, the Agency has identified elements which the NDPs should either include, improve and/or display to ensure transparency and comparability and/or to improve the quality of assessments. In this respect, the Agency formulates the following recommendations:

- the NDPs should include market studies for projects of cross-border relevance as they support the assessment of benefits; NDPs should use the European network models for projects of cross-border relevance to fully assess the project's influence on the interconnected network;
- the NDPs should better identify infrastructure costs by assessing all cost elements, and particularly by including operating costs⁸.

The following recommendations pertain to the development of the future ENTSO-E EU TYNDPs and their impact on the consistency and comparability with the NDPs:

- as already mentioned in the Agency's Opinion No 01/2015⁹, ENTSO-E EU TYNDPs should specify costs at investment item level and include the cost estimates for projects in the Regional Investment Plans, in order to ensure a proper basis for a consistency check with the NDPs;
- as already mentioned in the Agency's Opinions No 21/2014¹⁰ and No 01/2015, the scenarios for future EU TYNDPs should include input data sets for the years n+5, n+10, n+15 and n+20, in order to ensure comparability with the NDPs scenarios;

⁸ Agency's "Consolidated report on the progress of electricity and gas projects of common interest" 30 June 2015, p. 38 "the net present value of life-cycle costs, which are mostly related to operational expenditures, represents 18% of the NPV of capital expenditures of the corresponding projects".

http://www.acer.europa.eu/official_documents/acts_of_the_agency/publication/consolidated%20report%20on%20the%20progress%20of%20electricity%20and%20gas%20projects%20of%20common%20interest.pdf

⁹ Agency's Opinion No 01/2015 of 29 January 2015 on the ENTSO-E draft Ten-Year Network Development Plan 2014, Section 8.1.

http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Opinions/Opinions/ACER%20Opinion%2001-2015.pdf

¹⁰ Agency's Opinion No 21/2014 of 19 December 2014 on the draft ENTSO-E Scenario Outlook and Adequacy Forecast 2014-2030. Section 3.4.

http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Opinions/Opinions/ACER%20Opinion%2021-2014.pdf

- future EU TYNDPs should include a mapping of cross-references between the investment codes in different plans¹¹. ENTSO-E should ensure consistency already in the first steps of preparation of future TYNDPs.

Furthermore, the Agency has identified national components of transmission investments in ENTSO-E EU TYNDP 2014 and ENTSO-E Regional Investment Plans 2014, which are not included in the NDPs, mainly due to different timing of the plans or due to them being Third Party Projects (“TPPs”). ENTSO-E should explain these differences in their upcoming EU TYNDP 2016.

A more detailed analysis of the differences and similarities between the EU TYNDP 2014 and the NDPs is provided in the Annex.

Done at Ljubljana on 23 March 2016.

For the Agency:


Alberto Pototschnig
Director

¹¹ Agency’s Opinion No 01/2015, page 11.

Annex – Summary of NRA responses on national development plans

Responses

29 responses from NRAs (AT, BE, BG, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IT, LT, LV, LU, MT¹², NL, NO, PL, PT, RO, SE, SI and SK) were received.

No response was received from NI.

A. The comparison between the national development plans and the EU TYNDP

In line with the approach used in the Agency’s Opinion No 08/2014, the comparison between the NDPs and the EU TYNDP is performed taking into account:

- the provisions of Articles 8(10) and (11) of Regulation No 714/2009 and Article 37(1)(g) of Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC (Directive 2009/72/EC)¹³;
- the provisions of Article 22 of Directive 2009/72/EC for national ten-year network development plans prepared by independent transmission operators; and
- the timing of preparation of the NDPs and of the ENTSO-E EU TYNDP 2014.

10 jurisdictions reported differences between the NDP and the EU TYNDP 2014 related to the commissioning date of the investments, to projects included in the EU TYNDP but not in NDPs and *vice-versa*, referring to the times of publication of the two plans as the main cause.

Table 1 presents the timing of publication of a (usually draft) NDP by TSOs and of its submission to the national competent authorities. When applicable, both the NDP “before” ENTSO-E EU TYNDP 2014 and the NDP “after” ENTSO-E EU TYNDP 2014 are presented. The orange vertical lines correspond to the main milestones of the ENTSO-E EU TYNDP 2014:

- publication of the draft ENTSO-E EU TYNDP 2014 by ENTSO-E and its submission to the Agency for its opinion (31 October 2014); and
- the Agency’s Opinion, which recommends amendments to the draft ENTSO-E EU TYNDP 2014 (29 January 2015).

Table 1 also shows different frequencies in preparing NDPs, with the large majority of jurisdictions having either a yearly or a biennial frequency.

¹² Is not included in the analysis of the responses to the online questionnaire as there is no transmission system in Malta. However, MT is included in the comparison of investments in national development plans and in the ENTSO-E EU TYNDP 2014 and Regional Investment Plans providing information about their investments.

¹³ OJ L 211, 14.8.2009, p. 55.

B. Time horizon of the NDPs

The time horizon of NDPs is 10 years for the large majority of jurisdictions (23 out of 28). Other reported practices include: 20 years in Denmark and Norway, 15 years in Estonia and Hungary, and 6 years in Spain. Great Britain provides a 20-year horizon, alongside the 10-year one, with the former being less detailed than the latter. Germany provides two horizons every two years: a short-term horizon, with a time span of 10 to 15 years, and a long-term horizon, with a time span of 15 to 20 years. The short-term horizon includes at least 3 scenarios. One of the short-term scenarios will be expanded to a long-term one.

C. Comparison of the scenarios and study horizons used in the EU TYNDP 2014 and NDPs

The analysis of the compatibility between the scenarios in the EU TYNDP 2014 with those in NDPs is carried out on the following elements:

- study horizon;
- elements and methodology of the scenarios.

Study horizon of the scenarios used in the EU TYNDP and NDPs

The EU TYNDP 2014 is limited to a single study horizon at year 2030, while on the national side:

- 15 NDPs cover a single study horizon,
- 8 NDPs cover two study horizons,
- 4 NDPs cover three study horizons, and
- 1 NDP cover five study horizons.

Out of the 28 jurisdictions whose NRAs responded to the questionnaire, 10 NDPs include a study horizon up to the year $n+5$, 18 NDPs include a study year $n+9$ or $n+10$, 10 NDPs include a study year around $n+15$ and 3 NDPs have a study horizon well beyond 15 years as shown in Table 2.

9 NDPs (AT, BG, EE, FR, GR, LV, LT, LU and SI) developed more than one scenario for a single study year, while 6 NDPs (HR, CZ, FI, IE, PT and SE) developed a single scenario for a single study year.

Among jurisdictions with multiple study years, 9 NDPs (CY, DK, GB, HU, IT, NL, PL, SK and ES) developed the same scenario or scenarios for all study years, while 2 NDPs (BE and NO) use a broader scenario approach for the long-term, as in the EU TYNDP, and 2 NDPs (DE and RO) use a different approach.

Table 2: Study horizons and number of NDP scenarios

Country	Study horizon of the scenarios used in NDP																									Number of scenarios
	n	n+1	n+2	n+3	n+4	n+5	n+6	n+7	n+8	n+9	n+10	n+11	n+12	n+13	n+14	n+15	n+16	n+17	n+18	n+19	n+20	n+25	n+35			
Austria																3									3	
Belgium					1											4									5	
Bulgaria									2																2	
Croatia										1															1	
Cyprus	2			2						2															2	
Czech Republic																1									1	
Denmark				1						1											1				1	
Estonia																4									4	
Finland										1															1	
France																4									4	
Germany (1)										1											1				4	
Great Britain (2)										2						4							4		4	
Greece										3															3	
Hungary					4					4						4									4	
Ireland										1															1	
Italy				2						2															2	
Latvia											2														2	
Lithuania										3															3	
Luxembourg																					4				4	
Norway					1											3									3	
The Netherlands			2			2			2																2	
Poland											3					3									3	
Portugal											1														1	
Romania	1			1		3				1							1								4	
Slovak Republic					3						3														3	
Slovenia										4															4	
Spain		3				3																			3	
Sweden											1														1	
(1)	Additional to 10-year scenarios also 20-year scenarios are taken into account.																									
(2)	Detailed description of projects within a 10 year horizon, less detailed description within a 20 year horizon.																									
scenarios with multiple target years																										
scenarios with a single target year																										
n represents the year of the NDP																										

Elements and methodology used for the construction of the scenarios

The methodology used for the construction of the EU TYNDP 2014 scenarios at year 2030 (called Visions) is based on the estimation of “extreme” values between which the evolution of parameters is expected to occur. The EU TYNDP 2014 describes the elements taken into account for the construction of the four Visions as economic and markets, demand, generation and grid evolution. In the EU TYNDP 2014, the infrastructure needs and the benefits of the projects are identified for each of the 4 Visions.

The construction of NDP scenarios displays a large variety of approaches in defining the future, as shown in Table 2.

The Agency notes that all NDPs reported at least that generation and demand assumptions were taken into account when constructing the scenarios for the NDP, ensuring a degree of comparability with

the elements of scenarios from the EU TYNDP. Some jurisdictions also consider assumptions related to economic and market evolution when developing the scenarios.

From the responses received, the Agency notes that scenarios are used in general for the following purposes:

- to identify the projects to be included in the NDP in order to resolve the structural constraints of the system; and
- to check the robustness of the projects in every examined scenario.

D. Comparison of the analytical methodology used in the NDPs and ENTSO-E CBA methodology

In the EU TYNDP 2014, the projects of pan-European significance are assessed against 4 scenarios, using in part the publicly available (draft) of the CBA methodology. As the ENTSO-E Guideline for Cost Benefit Analysis of Grid Development Projects was approved by the European Commission on 5 February 2015, the Agency considers it as a base of comparison for NDPs.

Studies used for the project assessment

Within the EU TYNDP 2014 the following studies were performed to assess the projects:

- Pan-European market studies for each scenario, which were set up to define parameters and data sets and to provide boundary conditions to ensure the overall consistency of the regional market studies;
- Regional market studies; and
- Network studies.

At the national level, based on the information provided by NRAs, 64% of the NDPs (18 jurisdictions) include market studies, out of which 61% (11 jurisdictions) are based or partially based on the EU TYNDP market assumptions and 67% (12 jurisdictions) are based or partially based on regional assumptions as illustrated in Table 3.

Table 3: Market Studies included in the NDPs

Country	Market studies based on TYNDP assumptions			Market studies based on Regional assumptions			No market studies performed
	Yes	No	Partially	Yes	No	Partially	
Austria			X			X	
Belgium	X						
Bulgaria	X			X			
Croatia							X
Cyprus							X
Czech Republic							X
Denmark							X
Estonia	X			X			
Finland							X
France			X				
Germany			X	X			
Great Britain		X				X	
Greece							X
Hungary							X
Ireland		X		X			
Italy		X			X		
Latvia	X				X		
Lithuania							X
Luxembourg						X	
Netherlands			X			X	
Norway		X			X		
Poland							X
Portugal	X			X			
Romania		X			X		
Slovakia							X
Slovenia			X			X	
Spain				X			
Sweden			X	X			

Network studies performed by the NDPs

A network study is performed for each scenario of the EU TYNDP 2014. Network studies enable detailed assessment of the behaviour of the transmission grid under different assumptions.

At the national level, all TSOs perform network studies when preparing their NDPs. The network model used by more than half of the jurisdictions is the Regional network model, followed by pan-European network model in 4 jurisdictions. 6 jurisdictions use a National network model and other models are used in 3 jurisdictions, as shown in Table 4.

Table 4: Network studies performed by the NDPs

Country	Network model used for the assessment of projects included in NDP				Dynamic studies performed for projects included in the NDP		
	Pan-European network model	Regional network model	National network model	Other (please specify)	Yes for all projects	Yes, when relevant	No
Austria		X				X	
Belgium		X				X	
Bulgaria	X					X	
Croatia		X				X	
Cyprus				(1)			X
Czech Republic		X					X
Denmark			X				X
Estonia		X				X	
Finland			X				X
France		X			X		
Germany	X					X	
Great Britain		X				X	
Greece		X				X	
Hungary		X					X
Ireland		X				X	
Italy				(2)		X	
Latvia	X						X
Lithuania			X			X	
Luxembourg			X			X	
Netherlands	X					X	
Norway		X				X	
Poland			X			X	
Portugal				(3)		X	
Romania		X			X		
Slovakia		X					X
Slovenia		X				X	
Spain			X		X		
Sweden		X				X	
(1)	N/A. Cyprus is an isolated system.						
(2)	The Italian NDP indicates a "forecasted network" with static and dynamic studies. It mentions that "planning is in the wider process of European planning" and "common studies on pan-European perimeter". However, a specific (single) network model is not specified. This situation may be related to different nature and specificities of projects and related needs for different scopes of network modeling.						
(3)	Portuguese TSO uses all types of network studies depending on the project. It uses a detailed national network model, a simplified Spanish model and uses the results of the TYNDP for interconnection projects (and results are based on pan European model provided by ENTSO-E)						

Dynamic studies

Based on the information received, the Agency notes that only 3 jurisdictions (FR, ES and RO) perform dynamic studies to assess all projects, while 18 jurisdictions perform dynamic studies when considered relevant.

The Agency welcomes the initiative to perform dynamic studies as a good practice to identify risks associated with the high penetration of renewables and other stressed network conditions.

Recursive process between market studies and network studies

ENTSO-E CBA methodology depicts the possibility for an output from the network studies - i.e. the increase of the cross-border capacity - to be retrofitted in market studies in order to assess the improvements brought by the expanded grid.

From the national perspective this recursive process, where relevant, is addressed in 39% of the jurisdictions.

Elements of the project costs used to estimate the costs indicated in NDPs

Based on the information received, the Agency notes that 79% of the jurisdictions use one or more of the element costs included in the total project expenditures as described in the ENTSO-E CBA methodology to estimate the investment item costs displayed in the NDPs. The costs related to environmental impacts are included in 29% of the NDPs and the costs related to social impacts are included in 25% of the NDPs. A detailed description of the element costs used for the calculation of the project cost in each jurisdiction is presented in Table 5.

Regarding the total project expenditures, 75% of the NDPs include in the investment item cost the expected cost of materials and assembly costs, 39% include the expected costs of temporary solutions which are necessary to realise a project, 36% include expected environmental and consenting costs, 32% include expected costs of devices that have to be replaced within the given period, 21% include dismantling costs at the end of the life of the equipment and 18% include maintenance costs and costs of the technical life cycle.

Taking into account that life cycle costs are an important part of infrastructure costs (as identified by the Agency in its consolidated report on the progress of electricity and gas projects of common interest 2015), the Agency deems an essential first step for better cost identification that NDPs appropriately address operating costs for projects with cross-border relevance.

Table 5: Elements of the project costs used for estimating the costs included in NDPs

Country	Element costs of the Total project expenditures							Costs associated to the environmental impact			Costs associated to the social impact	
	Expected cost for materials and assembly costs	Expected costs for temporary solutions which are necessary to realise a project	Expected environmental and consenting costs	Expected costs for devices that have to be replaced within the given period	Dismantling costs at the end of life of the equipment	Maintenance costs and costs of the technical life cycle	Other	Yes	No	Other	Yes	No
Austria	X	X	X					X				X
Belgium							(1)		X			X
Bulgaria	X			X		X			X			X
Croatia	X								X			X
Cyprus	X		X	X				X			X	
Czech Republic							(2)		X			X
Denmark	X				X				X			X
Estonia	X		X	X	X				X			X
Finland							(3)		X			X
France							(4)			(10)	(11)	
Germany	X								X			X
Great Britain	X	X		X	X	X			X			X
Greece	X								X			X
Hungary							(5)		X			X
Ireland							(6)		X			X
Italy	X		X			X	(7)		X			X
Latvia	X		X	X		X		X			X	
Lithuania	X								X			X
Luxembourg	X	X							X			X
Netherlands	X	X							X			X
Norway	X	X	X	X	X				X		X	
Poland	X	X	X	X	X			X				X
Portugal							(8)		X			X
Romania	X	X						X			X	
Slovakia	X	X	X					X				X
Slovenia	X	X	X						X			X
Spain	X	X		X				X			X	
Sweden	X	X	X	X	X	X	(9)	X			X	
<p>There are no project costs indicated in the NDP. However, for the selection of the projects: investment costs, maintenance costs, costs provoked by congestions, (1) cost of losses etc. are taken into account. Environmental aspects, social acceptability and safety are also taken into account.</p> <p>The NDP does not include a decomposition of costs as suggested in the question. It offers a different point of view and shows reasons for grid development, e.g. (2) consumer requested grid development (connections), renovations etc.</p> <p>(3) Total project expenditures are not specified in the NDP.</p> <p>(4) No costs are available in the French plan. There is only a total investment cost associated to each scenario.</p> <p>(5) Total project expenditures available to the competent authority but not published and its not part of NDP</p> <p>(6) No costs are specified in the NDP. Costs are provided in a separate project monitoring programme which the TSO provides to the NRA for major projects. The costs are: CAPEX (for the main investment), CAPEX for dismantling existing infrastructures and OPEX. The cost estimate is updated with new environmental (7) and social requirements at the end of the permitting process.</p> <p>The NDP only includes total expected costs which include all the above categories. However the DNP shows only direct external costs on a published unit cost (8) basis so the final real cost can vary. No finance cost nor overhead costs are shown, but the NDP explains how they are included in final cost.</p> <p>(9) Secondary environmental and social impacts are not monetised</p> <p>Although costs associated to the environmental impact on a project basis are not displayed in the NDP, an environmental impact report dealing with the NDP as (10) a whole is attached to it.</p> <p>The cost associated to the social impact is taken into account but not necessary monetised. Social costs are taken into account in the cost benefit analysis made (11) to select the project</p>												

Based on the responses received from 26 NRAs¹⁶, the Agency notes that the total amount of transmission investments (CAPEX) planned in the NDPs for a time horizon of 10 years is 86 billion euros.

The comparison of total planned costs in the NDPs (86 billion euros) with the total costs displayed in EU TYNDP 2014 (from 60 to 78 billion euros)¹⁷ reveals a difference which is explained in particular by the costs of the national and regional projects included in the NDPs, partially offset by the presence of EU TYNDP projects in jurisdictions inside and outside the EU, which are not considered in the present analysis¹⁸.

Benefits and impacts included in the NDPs

In the EU TYNDP 2014 the following five benefits are presented in a quantitative format for each cluster: Security of Supply, Social Economic Welfare, RES integration, variation of losses and variation in CO2 emissions. Furthermore, two benefits are taken into account as key performance indicators in the multi-criteria analysis: technical resilience and flexibility.

Based on the information received, the Agency notes that the following benefits were taking into account by TSOs when elaborating the NDPs:

- Security of supply benefits in 89% of the NDPs (of which, 88% not monetised and 12% monetised).
- Social Economic Welfare benefits in 46% of the NDPs (of which, 38% not monetised and 62% monetised).
- Variation of CO2 benefits in 36% of the NDPs (of which, 90% not monetised and 10% monetised).
- RES integration benefits in 79% of the NDPs (of which, 86% not monetised and 14% monetised).
- Variation of losses benefits in 61% of the NDPs (of which, 82% not monetised and 18% monetised).
- Technical resilience benefits in 86% of the NDPs (of which, 96% not monetised and 4% monetised).
- Flexibility benefits in 75% of the NDPs (of which, 90% not monetised and 10% monetised).

Further, regarding impacts:

- the Environmental impact is taken into account in 57 % of the NDPs (of which, 94% not monetised and 6% monetised).
- The Social impact is taken into account in 43 % of the NDPs (of which, 83% not monetised and 17% monetised).

This information is summarised in Table 6.

¹⁶ No information on the total amount of transmission investments planned in the NDP was received from the NRAs in GB and NO

¹⁷ Agency's Opinion No 01/2015, page 17.

¹⁸ In addition to differences in the cost categories, which were already discussed.

Table 6: Benefits and impacts included in the NDPs

Country	Improved security of supply	Socio-economic welfare (SEW) calculated based on generation cost approach	Socio-economic welfare (SEW) calculated based on total surplus approach	Congestion rents (if not included in the SEW)	RES integration	Variation of losses	Variation in CO2 emissions	Technical resilience/ system safety	Flexibility	Environmental impact	Social impact	Other benefit
Austria												
Belgium												
Bulgaria												
Croatia												
Cyprus												
Czech Repub												
Denmark												
Estonia												
Finland												
France												
Germany												
Great Britain												
Greece												
Hungary												
Ireland												
Italy												
Latvia												
Lithuania												
Luxembourg												
Netherlands												
Norway												
Poland												
Portugal												
Romania												
Slovakia												
Slovenia												
Spain												
Sweden												
	Yes, and monetised											
	Yes, but not monetised											
	No											

Four TSOs included in the NDPs other benefits apart from those displayed in Table 6.

- Greece has taken into account the increase in interconnector’s capability and market integration (both not monetised).
- Italy has taken into account the avoided investments. Furthermore, RES-GC and SEW-TS are alternative options for monetising the same underlying benefit. "Flexibility" means benefits related to balancing and ancillary services.
- Lithuania has taken into account the benefits related to the synchronous interconnection with the Continental European networks.
- Portugal has taken into account the benefits related to the variation in employment created by the project.

E. Transparency of the information displayed in EU TYNDP and NDPs

Status of investments in national development plans

The EU TYNDP 2014 presents a summary table with project-by-project information, including information, per investment item, on:

- the expected commissioning date;
- the present investment status;
- the evolution since the previous EU TYNDP;
- the Grid Transfer Capability (GTC) increase;
- benefits;
- costs.

The analysis of the Agency revealed that for a large majority of NDPs the information on commissioning date and on investment status is publicly available, while information on the increase of cross-border capacity, costs and benefits are often only partially made public.

38% of the NDPs list, for transparency purposes, the investments which were present in the previous corresponding NDPs and were commissioned or cancelled since then.

Commissioning date and status

25 (out of 28) NDPs publish the commissioning date and 20 publish the status of the investment. Exceptions are: for the 'commissioning date': DK and IT only partially, and CY available only for the competent authority; and, for 'status' information: CY, LV and PL available only for the competent authority and ES and SI partially; ES provides progress status through bi-annual monitoring documents.

Progress since previous NDP

11 NDPs provide the progress of the projects since the last NDP.

Cross-border capacity

In the EU TYNDP 2014, new projects increase the Grid Transfer Capability (GTC). The values of the additional GTC are oriented and range from a few hundred MW to several GW.

Based on the responses received, the Agency observes that a large majority of NDPs indicate the planned cross-border capacities and more than half of the NDPs include the estimated cross-border capacities as planned in the EU TYNDP 2014.

9 NDPs included the estimated cross-border capacities as planned in the latest available NDPs of their neighbouring jurisdictions.

The jurisdictions which publish in the NDPs the information on increase of cross-border capacity are listed in Table 7.

Table 7: Cross-border capacity published in the NDPs

Yes	No	Partially	n.a.
BE			
BG	CZ	AT	
DE	DK	ES	
FI	EE	GR	
FR	GB	HU (per border only)	CY
GB	HR	IE	MT
LT	HU	IT	
LV	LU	SI (only for interconnections)	
NO	NL		
PL	SK		
PT	SE		
RO			

Estimated cost

In 14 cases out of 28, the published NDPs include project cost information, as indicated in Table 8.

Table 8: Estimated costs included in the NDPs

Yes	No	Partially	Available to the competent authority
BG			AT
CZ			HR
DK			CY
DE			FI
EE		ES	FR
GR		GB	HU
LT	BE	IT	IE
LV			NL
LU			PL
NO			RO
PT			
SI			
SK			
SE			

Estimated Benefits

6 NDPs do not include any estimated benefits while in 7 jurisdictions benefits are disclosed only to the competent authority, as indicated in Table 9.

Table 9: Benefits included in the NDPs

Yes	No	Available to the competent authority	Partially
AT			BE
BG			DE
DK			ES
FI			HR
GR			IE
LT			IT
PT			NO
			SI
			FR
	CZ	CY	
	EE	GB	
	HU	LU	
	NL	LV	
	SK	PL	
	SE	RO	

Third party projects in the national development plan

5 NDPs (FR, GR, GB, IT, NO) include or refer to third-party projects, either on an *ad-hoc* or a systematic basis.

F. Comparison of investments in national development plans and in the ENTSO-E EU TYNDP 2014 and Regional Investment Plans

Investments in NDPs which are not included in the EU TYNDP 2014

Based on the online data submissions from NRAs, the Agency identifies 46 national components of transmission investments in ENTSO-E EU TYNDP 2014, which are not included in NDPs, as shown in Table 1.

The reasons for non-inclusion are summarised in Figure 1. In general, the following (actual or potential) reasons have been detected:

- the investment is no longer included because it has been commissioned in the meanwhile;
- the investment is no longer included because it has been cancelled in the meanwhile;
- the (very long-term) investment is not included because the timespan of the NDP is shorter than the one of ENTSO-E EU TYNDP 2014;
- the third-party project (TPP) is not included because TPPs are normally not included in the NDP.

Table 10: National components of transmission investments in the ENTSO-E EU TYNDP 2014, which are not included in NDPs

Country Code	TYNDP Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
AT	1071	Würmlach (AT)	Border with IT	Würmlach - Somplago	Third party project
BG	265	Vidino (BG)	Svoboda (BG)	Internal line between Vidino and Svoboda (BG)	Project cancelled
BG	1112	Svoboda (BG)	Splitting point (BG)	Internal line between Svoboda (BG) and the splitting point of the interconnection Varna (BG) - Stupina (RO) in BG	Project cancelled
CY	971	Vasilikos site (CYPRUS)	Border with GR	New underwater cable HVDC-400 kV interconnection between Cyprus and Crete Islands.	Project Promoter has not submitted to the NRA the prerequisite studies required by the Regulation.
CY	1054	Border with IL	Vasilikos site (CYPRUS)	New underwater cable HVDC-400 kV interconnection between Israel and Cyprus.	Project Promoter has not submitted to the NRA the prerequisite studies required by the Regulation.
CZ	315	Kocin (CZ)	Prestice (CZ)	Adding second circuit to existing single circuit line OHL upgrade in length of 118km. Target capacity 2x1730	Current national development plan covers projects up to year 2024 with some outlook to year 2025. According to information in TYNDP about expected commissioning year (long term) this project is not relevant for National Development Plan
CZ	316	Mirovka (CZ)	Cebin (CZ)	Adding second circuit to existing single circuit line (88.5km, 2x1730 MVA).	Current national development plan covers projects up to year 2024 with some outlook to year 2025. According to information in TYNDP about expected commissioning year (long term) this project is not relevant for National Development Plan

Country Code	TYNDP Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
DE	179	Rommerskirchen (DE)	Weißenthurm (DE)	New line, extension of existing and erection of substations, erection of 380/110kV-transformers.	
DE	177	Goldshöfe (DE)	Bünzwangen (DE)	A new 380kV OHL. Length: 45km.	Project cancelled
DE	958	Güstrow (DE)	Gundremmingen (DE)	New DC- lines to integrate new wind generation from Baltic Sea and control area 50Hertz especially Mecklenburg-Vorpommern towards Central/south Europe for consumption and storage. Connections D20: Güstrow - Gundremmingen - Wolmirstedt; additional 2 GW connection	
DE	989	Muhlbach	Eichstetten	Operation at 400 kV of the second circuit of a 400kV double circuit OHL currently operated at 225 kV; some restructuration of the existing grid may be necessary in the area.	Not approved by NRA, even not essential in all national 2024-scenarios
DE	1016	Border with DK	Bentwisch (DE)	new 600 MW HVDC subsea cable connecting DK2 and DE	
DE	1107	Border with BE	DE (TBD)	This investment item envisions the possibility of a second 1 GW interconnection between Belgium and Germany. Subject to further studies.	
DE	136	Border area (DE-AT)	Border with CH	380 kV Rüthi – Meiningen and 380 kV Meiningen - Border Area AT-DE	"investment 136 now comprises the cross-border part of former investment 136, and investment 1099 is the Swiss part of former investment 136."

Country Code	TYNDP Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
DK	144	Border with DE	Kassö (DK)	Step 3 in the Danish-German agreement to upgrade the Jutland-DE transfer capacity. It consists of a new 400kV route in Denmark and In Germany new 400kV line mainly in the trace of a existing 220kV line.	The projects are not mature and there have been no studies made
DK	998	Idomlund (DKW)	Border with GB	2x700 MW HVDC subsea link across the North Seas.	No detailed project development or plan at present.
DK	1000	Malling (DKW)	Kyndby (DKE)	600 MW HVDC subsea link between both DK systems (2 synchr. areas, 2 market areas)	The project is not in the NDP (yet) as it is only under consideration with a long term commissioning date. Should the project be decided/actualised it will be incorporated in the NDP.
ES	38	Gatica (ES)	Border with FR	New HVDC interconnection in the western part of the border via DC subsea cable in the Biscay Gulf.	Time span of the NDP is shorter than TYNDP
ES	523	Reboria (ES)		North axis Project between Galicia and the Basque Country. Part of the project is considered as the Asturias Ring. It includes new 400kV substation Reboria.	Time span of the NDP is shorter than TYNDP
ES	1111	Gatica	Border with FR	Interconnection project between Indian Queens (Great Britain), Cordemais (France) and Gatica (Spain) in a multiterminal HVDC configuration with 3 sections of 1000 MW each, and a submarine route from Spain to Great Britain along the French coast.	No connection demand has been made to the French TSO.

Country Code	TYNDP Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
FR	1111	Cordemais	Border with GB	Interconnection project between Indian Queens (Great Britain), Cordemais (France) and Gatica (Spain) in a multiterminal HVDC configuration with 3 sections of 1000 MW each, and a submarine route from Spain to Great Britain along the French coast.	Time span of the NDP is shorter than TYNDP
GB	424	Border with NO	tbd (GB)	A new 1400MW HVDC bipolar installation connecting Western Norway and Great Britain via 800km subsea cable; DC voltage is to be determined.	Interconnector, hence not assessed in ETYS.
GB	782	Under Consideration (GB)	Under Consideration (GB)	Connection of Triton Knoll, Doggerbank & Hornsea GB Wind Farms and all associated works.	Customer connection works are not reported in the NDP as the NDP primarily focuses on wider works. Therefore the connection is not listed in the NDP but project 0000560 could be taken as part of the two East coast integration stages reported in the NDP.
GB	449	Richborough (GB)	Canterbury (GB)	New 400kV double circuit OHL and new 400kV substation in Richborough.	This is not explicitly identified in the ETYS as it does not add NETS capacity in England and Wales. It is essentially all about a local connection in terms of the UK NETS.
GB	755	Hackney (GB)	St. John's Wood (GB)	New Hackney- St. John's Wood 400kV double circuit.	This project is driven by and SoS/Asset Replacement requirement. It does not add any transmission connection capacity to the GB network or boundaries, and therefore it is unlikely to be seen or utilised by customers and as a consequence it is not included in the ETYS.

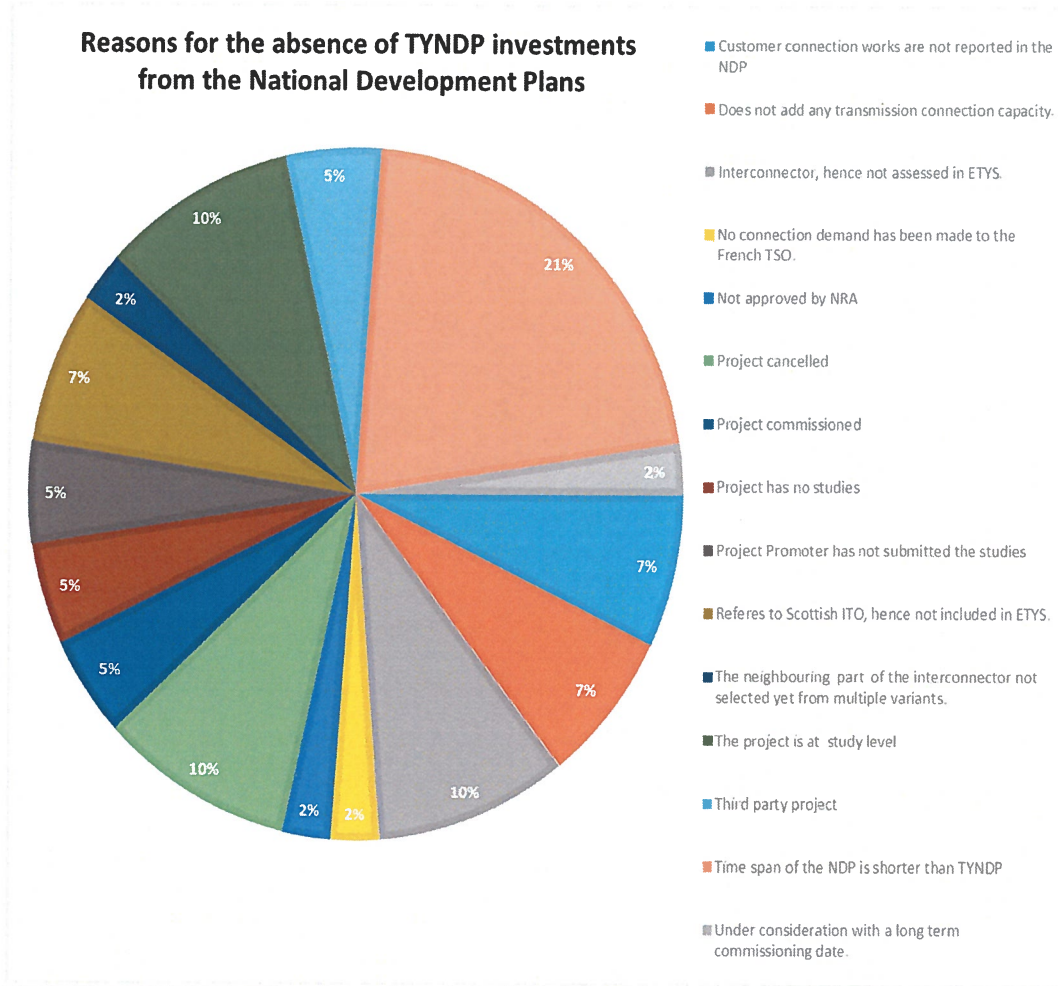
Country Code	TYNDP Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
GB	757	St. John's Wood (GB)	Wimbledon (GB)	New St. John's Wood- Wimbledon 400kV double circuit.	This project is driven by and SoS/Asset Replacement requirement. It does not add any transmission connection capacity to the GB network or boundaries, and therefore it is unlikely to be seen or utilised by customers and as a consequence it is not included in the ETYS
GB	809	Border with IE	Pentir (GB)	A new HVDC subsea connection between Ireland and Great Britain; this may be achieved by a direct link or by integrating an interconnector with a third party connection from Ireland to GB.	Interconnector, hence not assessed in ETYS.
GB	987	Vicinity of Exeter	Border with France	225 km HVDC link between France and Great Britain via the island of Alderney, with a capacity between 1000 and 1400 MW - exact value still to be determined (onshore and offshore).	Interconnector, hence not assessed in ETYS.
GB	998	Border with DK	Stella West (GB)	2x700 MW HVDC subsea link across the North Seas.	Interconnector, hence not assessed in ETYS.
GB	1020	Border with IE	Pembroke	Greenwire Interconnector spur 1, enables additional 500MW of interconnection between UK and Irish market	Customer connection works are not reported in the NDP as the NDP primarily focuses on wider works. The two Greenwire connections were treated as wind generation connection and part of the scenarios so not specifically mentioned other than as PCI interconnector in table 3.1 of the NDP.

Country Code	TYNDP Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
GB	1021	Woodland	Border with IE	Greenwire Interconnector spur 2, enables additional 1000MW of interconnection between UK and Irish market	Customer connection works are not reported in the NDP as the NDP primarily focuses on wider works. The two Greenwire connections were treated as wind generation connection and part of the scenarios so not specifically mentioned other than as PCI interconnector in table 3.1 of the NDP.
GB	1024	Cruachan	Argyll hub	HVCD link between Cruachan (onshore) to Argyll offshore hub	Refers to Scottish TO, hence not included in ETYS.
GB	1025	Argyll hub		A new dedicated offshore HVDC hub platform to allow connection of offshore renewable generation and interconnection capacity.	Refers to Scottish TO, hence not included in ETYS.
GB	1028	Argyll	Border with NI	HVCD link between Argyll offshore hub and Coleraine offshore hub	Refers to Scottish TO, hence not included in ETYS.
IT	1049	Border with AT	tbd (IT)	interconnector IT-AT (phase 2)	Not in Italian NDP - it is only a study
LT	377	Klaipeda (LT)	Telsiai (LT)	New single circuit 330kV OHL (943 MVA, 89km).	Project commissioned
LV	1065	Aizkraukle (LV)	Border with LT	To increase transmission capacity by 600 MW via Baltic States	Time span of the NDP is shorter than TYNDP
LV	1063 ¹⁹	TEC1	TEC2	Investment is necessary to strengthening internal grid in Latvia due to get transmission capacity of 600 MW via Latvia	Time span of the NDP is shorter than TYNDP

¹⁹ The connection point in TYNDP-2016 is slightly changed to RigaHPP instead Salaspils, due to higher SoS criteria (RigaCHP2 (LV)-Riga HPP)

Country Code	TYNDP Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
LV	1064	Viskali (LV)	Border with LT	To get 600 MW of capacity via Baltic States additionally.	Time span of the NDP is shorter than TYNDP
LV	996	LV-Grobina	Border with SE	A new HVDC link between LV-SE3, only as alternative of interconnector DE-SE4	The interconnection Latvia-Sweden is not approved now, due to Swedish part selection from alternative variants. From LV side connection point is expected Ventspils (LV) instead Grobina (LV)
NO	1033	Sima	Border with GB	A 650 km long 500 kV 1400 MW HVDC subsea interconnector between western Norway and eastern Scotland.	Features of the NDP / TPP (third party projects): the TPP project is not included because TPPs are normally not included in the NDP due to national law. Changes are foreseen in 2016.
RO	811	Tarnita (RO)	Mintia (RO)	New double circuit 400kV OHL Tarnita(RO)-Mintia(RO) 2x1380 MVA.	Study did not turn into a project
RO	812	Tarnita (RO)	Cluj E- Gadalin (RO)	New double circuit 400kV OHL Tarnita(RO)- Cluj E-Gadalin (RO) 2x1380 MVA.	Study did not turn into a project
RO	813	Tarnita (RO)		New 400kV substation connecting 1000 MW Hydro Pumped Storage Tarnita Lapustesti to the grid.	Study did not turn into a project
SE	996	Border with LV	SE3	A new HVDC link between LV-SE3, only as alternative of interconnector DE-SE4	Project cancelled
SK	720	Velké Kapušany (SK)	Border with HU	"Erection of new 2x400 line between Slovakia and Hungary from substation Velké Kapušany (SK) to the Kišvárda area (HU). The investment is under consideration"	Project is not included in the NDP because it has been delayed beyond the 10 year horizon

Figure 1: Reasons for absence of transmission investments from the EU TYNDP 2014 in the NDPs



Investments in national development plans which are not included in the Regional Investment Plans 2014

Furthermore, the Agency identified 62 national components of transmission investments in ENTSO-E Regional Investment Plans 2014, which are not included in NDPs as illustrated in Table 11. The reasons for these differences are summarised in Figure 2.

Table 11: National components of transmission investments in the ENTSO-E RIPs 2014, which are not included in NDPs

Country Code	ENTSO-E Regional Investment Plans 2014 Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
AT	613	Border with IT	Steinach (AT)	Upgrade of the existing 44km Prati di Vizze (IT) – Steinach (AT) single circuit 110/132kV OHL, currently operated at medium voltage.	TPP are not included in the NDP
AT	222	Silz (AT)	Zell-Ziller (AT)	Upgrade of the existing 220kV-double circuit- OHL Zell-Ziller- Silz. Line length: 42km.	
CZ	138	tbd (CZ)	Border with DE	Possible increase of interconnection capacity between CEPS and 50Hertz Transmission is under consideration: either a new 400kV tie-line (OHL on new route) or a reinforcement of the existing 400kV tie-line Hradec (CEPS) – Röhrsdorf (50Hertz Transmission).	Current national development plan covers projects up to year 2023 with some outlook to year 2025. According to information in TYNDP about expected commissioning year (2032) this project is not relevant for National development plan
CZ	887	Tynec (CZ)	Cechy stred (CZ)	New second circuit to existing single circuit OHL, upgrade in length of 46.2km. Target capacity 2x1730MVA.	Current national development plan covers projects up to year 2024 with some outlook to year 2025. According to information in TYNDP about expected commissioning year (long term) this project is not relevant for National development plan

Country Code	ENTSO-E Regional Investment Plans 2014 Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
CZ	892	Hradec (CZ)	Chrast (CZ)	New second circuit to existing single circuit OHL, upgrade in length of 82.4km. Target capacity 2x1730MVA.	Current national development plan covers projects up to year 2023 with some outlook to year 2025. According to information in TYNDP about expected commissioning year (long term) this project is not relevant for National development plan
DE	138	Border with CZ	tbd (DE)- South-Eastern 50 Hertz	Possible increase of interconnection capacity between CEPS and 50Hertz Transmission is under consideration: either a new 400kV tie-line (OHL on new route) or a reinforcement of the existing 400kV tie-line Hradec (CEPS) – Röhrsdorf (50Hertz Transmission).	Current national development plan covers projects up to year 2025. According to information in TYNDP about expected commissioning year (2032) this project is not relevant for National development plan
DE	651	Border with LU	Niederstedem (DE) or tbd (DE)	Upgrading and new construction of an interconnector to DE, in conjunction with the interconnector in the south of LU; Partial upgrading of existing 220kV lines and partial new construction of lines; With power transformer station in LU	This project is not a part of the national grid development plan neither 2012 nor 2013.
DE	967	northern region of 50Hertz		Construction of new substations/lines for integration of newly build power plants and RES in northern part of 50HzT control area.	Lack of clarity in project location, further monitoring could be difficult. It corresponds to multiple projects in the NDP.

Country Code	ENTSO-E Regional Investment Plans 2014 Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
DE	178	Goldshöffe and Engstlatt (DE)		Installation of 2x250 MVar 380kV capacitance banks (1x250 MVar Goldshöffe and 1x250MVar Engstlatt).	This project is not a part of the national grid development plan neither 2012 nor 2013.
DE	173	Hoheneck (DE)	Endersbach (DE)	Upgrade of the line Hoheneck-Endersbach from 220kV to 380kV. Length:20km.	Assignment of the project to any project of the NDP is difficult
DE	679	Pkt. Blatzheim (DE)	Oberzier (DE)	New 400 kV double circuit OHL Pkt. Blatzheim- Oberzier including extension of existing substations.	This project was included in the proposed grid development plan 2012 by the TSO, but it was not approved by the NRA.
DE	158	Irsching (DE)	Ottenhofen (DE)	Upgrade of 230kV connection Irsching-Ottenhofen to 400kV, including new 400kV switchgear Zolling. Length 76km.	Project cancelled
DE	961	Muhlbach	Scheer	New 400kV line substituting to existing 225kV line in Alsace area. Several solutions are under consideration and some restructuration of the 225 kV grid may be needed in the area. This investment is only needed in vision 4. This investment is needed only in vision4; triggered by high north-west to south-east flows in eastern France (from Lorraine and northern border to Alsace, southern Germany and Switzerland)	

Country Code	ENTSO-E Regional Investment Plans 2014 Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
DE	1078	Muhlbach		Two 400 kV phase-shifters will be installed in an existing substation in order to mitigate the flows when decommissioning Fessenheim nuclear power station these PST are part of the grid restructuration following the decommissioning of Fessenheim nuclear power plant.	
DE	1080	Scheer		in-out connection of Scheer 400kV existing substation to the existing line Bezaumont-Muhlbach. This investment is needed for securing the area after the decommissioning of Fessenheim power station. this investment is needed after Fessenheim nuclear power station decommissioning.	
DE	1081	Muhlbach	Scheer	Ampacity increase of existing 400 kV Muhlbach-Scheer line. This investment is needed after the decommissioning of Fessenheim power station.	

Country Code	ENTSO-E Regional Investment Plans 2014 Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
DE	975	Irsching	Ottenhofen	new 380-kV-OHL in existing corridor between Irsching and Ottenhofen new investment	"This project was included in the proposed grid development plan 2012 by the TSO, but it was not approved by the NRA."
DK	994	Bjæverskov	Border with PL	This project candidate investigates the possibility of establishing an interconnector between Bjæverskov (Denmark) and Dunowo (Poland). This very first conceptual study looks at a 500 kV 600 MW HVDC subsea connection, testing the idea of connecting these markets. This is a conceptual project. In case the assessment is promising, it might be taken to a next step, in case it is not, it will be cancelled.	The project is not in the national plan (yet) as it is only under consideration with a long term commissioning date. Should the project be decided/actualised it will be incorporated in the national plan.
DK	1015	Vester Hassing (DK1)	Border with SE	new 700 MW HVDC subsea cable between DK1 and SE3 RGS common investigations for TYNDP14	The project is not in the NDP (yet) as it is only under consideration with a long term commissioning date. Should the project be decided/actualised it will be incorporated in the NDP.

Country Code	ENTSO-E Regional Investment Plans 2014 Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
DK	429	Ferslev (DK)	Vester Hassing (DK)	New 20km single circuit 400kV line via a cable with a capacity of approx. 800 MW.	The project is not in the NDP but is mentioned in in the REGIP (Northsee) as a project that goes beyond the NDP. Should the project be decided/actualised it will be incorporated in the NDP.
DK	431	Tjele (DK)	Trige (DK)	New 46km single circuit 400kV line via cable with capacity of approx. 1200 MW.	The projects are not mature and there have been no studies made.
EE	387	Tartu (EE)	Sindi (EE)	A new 162km internal connection will be established on existing route resulting in double circuit line with 2 different voltages (330kV / 110kV). 330kV circuit.	Project commissioned
EE	734	Tartu (EE)	Sindi (EE)	A new 162km internal connection will be established on existing route resulting in double circuit line with 2 different voltages (330kV / 110kV). 110kV circuit.	Project commissioned
EE	737	Püssi (EE)	missing (EE)	A new HVDC (450kV) connection between Estonia and Finland.	Project commissioned
ES	592	Amorebieta (ES)	Gueñes (ES)	Uprates required in basque country and Catalonia in order to use fully the benefit of the long term ES-FR interconnection.	

Country Code	ENTSO-E Regional Investment Plans 2014 Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
ES	1046	Almazan	Medinaceli	new 400kV axis Almazan-Medinaceli new requirement attached to RES flow integration	
ES	1047	Cordoba	Cordoba	input/output of Cordoba substation in the 400 kV line Cabra -Guadame need of support the demand in Cordoba	
FI	803	Rauma (FI)	Forssa (FI)Lieto (FI)Ulvila (FI)	New single circuit 400 kV OHLs required to connect TVO's new 1 000-1 800 MW nuclear power plant that will be built in Olkiluoto	Project cancelled
FI	397	Border with FI	Pirttikoski or Petäjaskoski (FI)	New single circuit 380 - 400kV OHL (500km). Alternative to smaller capacity increase of parallel and series compensation	
GB	748	Bramford (GB)	Sizewell C (GB)	Reconductoring the existing circuit which runs from Bramford- Sizewell with a higher rated conductor.	Project cancelled
GB	750	Walpole (GB)	Bramford (GB)	Reconductoring the existing circuit which runs from Walpole- Norwich Main- Bramford with a higher rated conductor.	Project commissioned
GB	756	Tilbury (GB)	Elstree (GB)	Uprate Elstree- Warley- Tilbury from 275kV to 400kV.	Project cancelled

Country Code	ENTSO-E Regional Investment Plans 2014 Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
GB	758	West Weybridge (GB)	Beddington (GB)	Upgrade the 275kV overhead line route between West Weybridge- Chessington- Beddington to 400kV.	Project cancelled
IE	777	Carrickmines (IE)	Dunstown (IE)	A new 45km single circuit 400kV OHL from Dunstown 400 kV station to a new 400 kV station in the vicinity of Carrickmines 220 kV station.	Project cancelled
IE	778	Carrickmines (IE)		New 400 kV station in the vicinity of Carrickmines 220 kV station.	Project cancelled
IE	814	Oriel (IE)	Oriel Wind Farm (IE)	Oriel off-shore wind farm connecting to a new Oriel 220 kV station located on the Louth - Woodland 220 kV circuit	Third party projects are not included in the NDP
IE	815	Carrickmines (IE)	Kish Bank Wind Farm (IE)	Kish Bank off-shore wind farm connecting to the existing Carrickmines 220 kV station	Third party projects are not included in the NDP
LT	381	Visaginas (LT)	Border with LV	Upgrade single circuit OHL (943 MVA, 50km).	Project cancelled

Country Code	ENTSO-E Regional Investment Plans 2014 Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
LU	651	Bascharage (LU)	Border with DE	Upgrading and new construction of an interconnector to DE, in conjunction with the interconnector in the south of LU; Partial upgrading of existing 220kV lines and partial new construction of lines; With power transformer station in LU	Not in NDP. Too early to be financially evaluated and thus put in the NDP : studies and approaches reported after 2023
LV	381	Border with LT	Liksna (LV)	Upgrade single circuit OHL (943 MVA, 50km).	Project cancelled

Country Code	ENTSO-E Regional Investment Plans 2014 Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
NO	423	Skaidi (NO)	Varangerbotn (NO)	New 230 km single circuit 400kV OHL.	Features of the NDP / timespan: the (long term / very long term) project is not included as defined projects since the need for new capacity is not finally identified and there can be different solutions to satisfy this need. The national development plan contains a descriptions of a possible need for increasing the capacity in this area. NDP mentions a possibility for a future need for higher capacity mainly connected to developments in the petroleum sector. A 400 kV power line between Skaidi and Varangerbotn has been considered as a solution earlier, but due to a possible lower power demand Statnett is now considering other solutions. This is still under consideration and not specified to a project.
NO	405	Kristiansand (NO)	Rød (NO)	Voltage upgrading of an existing single circuit 300kV OHL Kristiansand-Bamble. New 400 kV OHL line Bamble-Rød. New substation Bamble	Project commissioned

Country Code	ENTSO-E Regional Investment Plans 2014 Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
NO	426	Kristiansand (NO)	Border with DK	4th HVDC connection between Southern Norway and Western Denmark, built in parallel with the existing 3 HVDC cables; new 700MW including 230km 500kV DC subsea cable.	Project commissioned
NO	417	Aura/Viklandet (NO)	Fåberg (NO)	Voltage upgrading of existing single circuit 300kV OHL Aura/Viklandet-Fåberg.	Project cancelled
NO	409	Feda, Tonstad (NO)		Reactive power devices in 400kV substations. This investment proposed as stand-alone in the TYNDP 2010 is now merged into investment 37.406 (ACER investment code 0000278)	Project commissioned

Country Code	ENTSO-E Regional Investment Plans 2014 Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
NO	1017	Nedre røssåga	Border with SE	If realized the line most probably will replace the existing 220 kV line between Nedre Røssåga (northern Norway) and Grundfors (northern Sweden).	Features of the NDP / timespan: the (long term / very long term) project is not included as defined projects since the need for new capacity is not finally identified and there can be different solutions to satisfy this need. The NDP contains a descriptions of a possible need for increasing the capacity in this area. NDP mentions a possibility for a future need for higher capacity between price area NO4 and SE2 depending on if there will be a high Wind Power integration in North-Norway and North of Sweden, this is still under consideration and not specified to a project.
NO	408	Kristiansand, Fedal (NO)		Reactive compensation due to HVDC links NorNed and Skagerak 4. Reactive power devices in 400kV substations.	Project commissioned

Country Code	ENTSO-E Regional Investment Plans 2014 Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
NO	397	Varangerbotn (NO)	Border with FI	New single circuit 380 - 400kV OHL (500km). Alternative to smaller capacity increase of parallel and series compensation	Features of the NDP / timespan: the (long term / very long term) project is not included as defined projects since the need for new capacity is not finally identified and there can be different solutions to satisfy this need. The NDP contains a descriptions of a possible need for increasing the capacity in this area. NDP mentions an ongoing study on the need for grid investments in the northern most region in Norway (Finnmark). This study includes considerations of increased capacity between the Finnmark region and Finland, but a specific project is not mentioned.
PL	375	Plock (PL)	Olsztyn Matki (PL)	New single circuit line 400kV (1870 MVA, 180km).	Project is not in NDP, because its realisation is planed after 2025. NDP covers the years 2016-2025.

Country Code	ENTSO-E Regional Investment Plans 2014 Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
PL	994	Border with DK	Dunowo	<p>This project candidate investigates the possibility of establishing an interconnector between Bjæverskov (Denmark) and Dunowo (Poland). This very first conceptual study looks at a 500 kV 600 MW HVDC subsea connection, testing the idea of connecting these markets.</p> <p>This is a conceptual project. In case the assessment is promising, it might be taken to a next step, in case it is not, it will be cancelled.</p>	<p>The project is not in the national plan (yet) as it is only under consideration with a long term commissioning date. Should the project be accepted it will be incorporated in the national plan.</p>

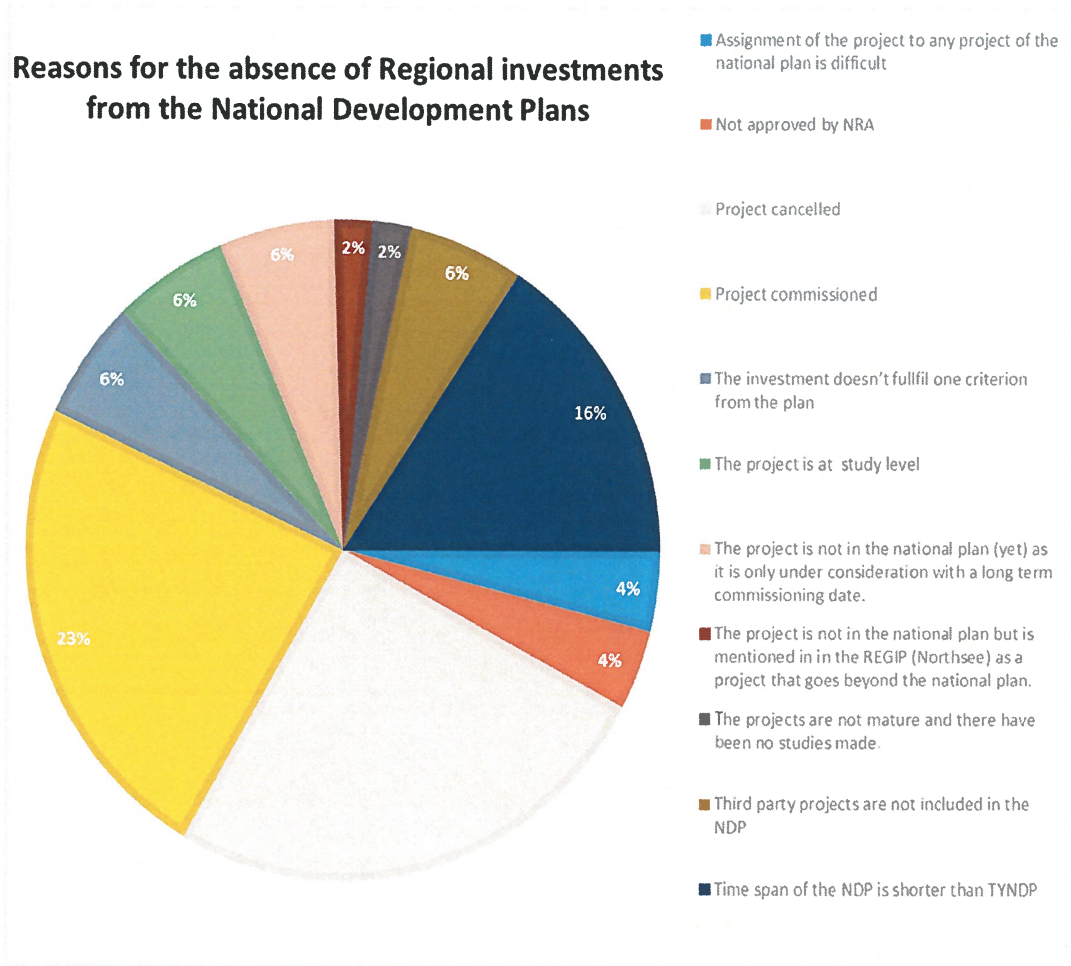
Country Code	ENTSO-E Regional Investment Plans 2014 Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
PT	477	Ribeira de Pena (PT)	Guarda (PT)	New 192km double/single-circuit 400kV OHL Ribeira de Pena (PT)- Guarda (PT). In a first step, only 75 km will be constructed and operated at 220 kV between Vila Pouca de Aguiar and Macedo de Cavaleiros, in a second step one circuit of this line will be operated at 400 kV. A single line will be constructed between Macedo de Cavaleiros zone and Pocinho zone also between Pocinho zone and Chafariz zone a double circuit 400 kV OHL will be constructed (only one circuit installed in a first step), this last line will use one circuit of the line Seia- Guarda to establish the line Ribeira de Pena (PT)- Guarda (PT).	The project is not included in NDP as the last part of the project connecting “Guarda and Ribeira da Pena” is described only in terms of commissioning date and cost, but not described in detail inside the NDP. As it is only to be concluded after 2021 and therefore it is not described in detail in current NDP (but information on cost and commission date is available)

Country Code	ENTSO-E Regional Investment Plans 2014 Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
PT	485	Seia (PT)	Guarda (PT)	New double circuit 400 kV OHL Seia-Guarda (55km)	The project is not included in NDP as the last part of the project connecting “Guarda -Seia” is described only in terms of commissioning date and cost, but not described in detail inside the NDP. As it is only to be concluded after 2021 and therefore it is not described in detail in current NDP (but information on cost and commission date is available)
RO	717	Fantanele (RO)	Ungheni (RO)	Upgrade of the northern 220kV corridor which is part of the cross-section between the wind generation hub in Eastern Romania and Bulgaria and the rest of the system. The axis Stejaru-Ungheni is upgraded, by replacing the existing conductors with high thermal capacity, low sag conductors; >460MVA.	Studies performed confirmed the project as necessary only under specific system evolution scenarios. It stays under consideration and will be included in TYNDP if future evolutions will confirm the necessity

Country Code	ENTSO-E Regional Investment Plans 2014 Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
RO	268	Constanta (RO)	Border with TR	New DC link (subsea cable) between existing stations in RO and TR. Line length: 400km.	Studies performed confirmed the project as necessary only under specific system evolution scenarios. It stays under consideration and will be included in TYNDP if future evolutions will confirm the necessity
SE	400	Ekhyddan (SE)	Barkeryd (SE)	New single circuit 400kV OHL	Project cancelled
SE	402	Hallsberg (SE)	Barkeryd (SE)	"South West link" consisting of three main parts: 1) New 400kV line between Hallsberg and Barkeryd (SE)- The investments related also include new substations and converter stations in the connection points line.	Project commissioned
SE	783	Forsmark (SE)	Råsten (SE)	New 50km single circuit 400kV OHL	Project cancelled
SE	784	Råsten (SE)	Östfora (SE)	New 75km single circuit 400kV OHL	Project cancelled
SI	224	Krsko (SI)	Bericevo (SI)	New 400kV double circuit OHL between Krsko and Bericevo.	Project commissioned

Country Code	ENTSO-E Regional Investment Plans 2014 Code	Substation 1	Substation 2	Component / Investment item description	Reason of absence
SK	294	Lemešany (SK)	Velké Kapušany (SK)	Reinforcement of the existing single 400 kV line between Lemešany and Velké Kapušany substations. The project includes the extension both substations Lemešany and V.Kapušany. Line length: approximately 100 (including the loop erected under the Investment Connection of substation Voľa").	Periodicity of elaboration NDP and EU TYNDP 2014/RgIP 2014. (status correction was closed far earlier in 2014) whereas the NDP has been prepared, approved and published in beginning of 2015. Furthermore, project no. 437 is not included in the NDP because it has been delayed beyond its 10 year horizon. The information actualisation in EU TYNDP is thus difficult.
SK	293	Vola (SK)	point of splitting (SK)	"The Investment aims at connection of the new 400kV substation Voľa to the 400 kV transmission system. This will be done by splitting of the existing single 400kV line between Lemešany and Velké Kapušany substations. The new 400kV double circuit OHL will be of approximately 23km length".	Project commissioned
SK	719	Vola (SK)		"Upgrade of the existing substation Voľa from voltage level 220 kV to 400 kV".	Project commissioned

Figure 2: Reasons for absence of REG investments from the EU TYNDP 2014 in NDPs





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