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Agency for the Cooperation of Energy Regulators

OPINION OF THE AGENCY FOR THE COOPERATION OF ENERGY REGULATORS No 16/2014

of 30 July 2014

ON THE IMPLEMENTATION OF INVESTMENTS IN ELECTRICITY TRANSMISSION NETWORKS

THE AGENCY FOR THE COOPERATION OF ENERGY REGULATORS,

HAVING REGARD to Regulation (EC) No 713/2009 of the European Parliament and of the Council of 13 July 2009 establishing an Agency for the Cooperation of Energy Regulators[1], and, in particular, Articles 6(7) and 6(8) thereof,

HAVING REGARD to the favourable opinion of the Board of Regulators of 17 July 2014, issued pursuant to Article 15(1) of Regulation (EC) No 713/2009,

WHEREAS:

(1) Articles 6(7) and 6(8) of Regulation (EC) No 713/2009 task the Agency for the Cooperation of Energy Regulators ("the Agency") with monitoring the progress as regards the implementation of investments to create new interconnector capacity and the implementation of the electricity Union-wide ten-year network development plan ("EU TYNDP").

(2) In this Opinion, the Agency reports on its monitoring of progress in the development of the investments included in the list of investments of pan-European significance in Appendix 1 of the EU TYNDP released by ENTSO-E on 5 July 2012 ("TYNDP" investments). The monitoring has been performed with reference to investment items, as disaggregated in the ENTSO-E "2013 TYNDP Monitoring Update"[2].

(3) In this Opinion, the Agency also reports on its monitoring of the investments included in the Regional Investment Plans[3] published on 5 July 2012, which are not included in the 2012 EU TYNDP ("REG" investments) and of other investments of cross-border relevance, which are not included in the 2012 EU TYNDP or in the 2012 Regional Investment Plans, but appear either in the national investment plans ("OTHER" investments) or are developed by Third-Party Promoters ("TPP" investments).

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[1] OJ L 211, 14.8.2009, p.1

[2] ENTSO-E "2013 Monitoring update of the TYNDP 2012 Table of projects", 1 July 2013, Annex 1 – Monitoring update TYNDP https://www.entsoe.eu/fileadmin/user_upload/_library/SDC/TYNDP/2012/130701_Monitoring_update_TYNDP_2012_Table_of_projects_FINAL.pdf.

[3] ENTSO-E TYNDP 2012 (p.23) indicates that "investments needs and projects of European importance are comprehensively depicted in the Regional Investment Plans".

(4) National regulatory authorities ("NRAs") have provided essential input for this Opinion by submitting information on components of transmission investments[4] in an online data collection process (completed on 10 April 2014) and additional updates provided until 27 June 2014. This information is summarised in the Annex to this Opinion,

HAS ADOPTED THIS OPINION:

1. Introduction

In the Agency's view, the monitoring of the implementation of investments in electricity transmission networks should in principle include an evaluation over time of four fundamental aspects:

- the expected benefits from each investment;
- the increase of transfer capacity at a network boundary, and in particular, of cross-border grid transfer capability ("XB GTC")[5] delivered by each investment;
- the cost of each investment;
- the status and the timing/progress of each investment.

Benefits for society are the objective of network development and of individual investments. However, due to the interaction of different investments in meshed networks, measuring actual benefits of each investment is very complex (if not impossible, at least for some types of benefits).

The increase in XB GTC is a means to an end (the benefits), and not an end in itself. Albeit transfer capacity may also be affected by interaction among investments in meshed networks, it is more easily calculable and measurable than final benefits. It allows the monitoring of the actual evolution of capacity[6] once the investment is commissioned against the expected increase in XB GTC at the planning stage. Further, XB GTC may constitute a proxy for some types of benefits, in particular regarding market integration.

Similarly, the investment costs can also be easily monitored during the different phases of the investment (either as a planned range, planned value or as an actual value). The actual cost, once the investment is commissioned, can be assessed against the expected cost at the planning stage.

Finally, the status of each investment can be monitored through the identification of different investment phases. The timing and progress can be monitored through the identification of investment development steps[7], such as the approval of the investment in a national development

[4] In this Opinion, "component" (or investment component) means the national part of a transmission investment item.
[5] In this Opinion, the term "cross-border grid transfer capability" is used in line with ENTSO-E Guideline for Cost Benefit Analysis of Grid Development Projects, version 14 November 2013.
[6] Increase of Net Transfer Capacity (NTC).
[7] The Agency introduced a list of eleven steps in the process of developing electricity transmission projects of EU-wide importance. See Agency's recommendation regarding cross-border cost allocation requests, p.3. http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Recommendations/ACER%20Recommendation%2007-2013.pdf

plan, the start of the permitting procedure, the end of the permitting procedure, the start of the construction phase, the commissioning date and others.

As already noted in the Agency's Opinion on national ten-year electricity network development plans[8], the definitions of benefit- and cost-related aspects are still under development at European level[9], affecting the availability of investment-by-investment information in the 2012 EU TYNDP and in national plans, which is still limited.

In this Opinion therefore, the Agency focuses on the XB GTC and on the timing aspect (status and timing/progress of investment components). With respect to the latter aspect, very limited information is available on the dates of investment development stages, which are therefore not further discussed in this Opinion.

Section 2 identifies investments and investment components considered in this Opinion and provides an insight into the availability of data. Section 3 investigates increases in XB GTC, including a separate monitoring of commissioned investments. Section 4 describes the status of investment components. Section 5 assesses the progress in the implementation of investment components. Section 6 evaluates the delayed, rescheduled and cancelled investments, including an analysis of the causes for such delays, rescheduling and cancellations. Finally, Section 7 provides considerations with regard to investment monitoring in view of forthcoming EU TYNDPs.

2. Investments under monitoring and availability of data

The monitoring activity is performed at a disaggregated level, i.e. at transmission investment component level, even in the case of clusters. As some investment components of interconnection investments are located in countries outside the scope of this Opinion (which covers EU Member States and Norway[10]), the monitoring covers 838 components corresponding to 757 investments, as presented in Table 1.

[8] Opinion of the Agency for the Cooperation of Energy Regulators No 08/2014 of 4 April 2014 on National Ten-Year Network Development Plans pursuant to article 8(11) of the Regulation (EC) no 714/2009 http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Opinions/Opinions/ACER%20Opinion%2008-2014.pdf

[9] See ENTSO-E "Guideline to Cost Benefit Analysis of Grid Development Projects", 14 November 2013, https://www.entsoe.eu/fileadmin/user_upload/_library/events/Workshops/CBA/131114_ENTSO-E_CBA_Methodology.pdf.

[10] Thanks to the voluntary participation of the Norwegian NRA.

Table 1 Breakdown of investments and investment components

Category	Investments	Components of investments
TYNDP	607	656
REG	104	109
OTHER	13	18
TPP	33	55
Total	**757**	**838**
Out of which, interconnections	99	180
Out of which, internal	658	658

Assessments are based on the available data supplied by NRAs:

- information regarding the status of investment components is available for approximately 84% of them;
- information regarding the progress of investment components is available for approximately 64% of them;
- information regarding the commissioning date of investment components is available for approximately 67% of them.

When analysing the different categories of investments (TYNDP, REG, OTHER, TPP) separately, data availability appears to be more limited for TPP investments, compared to the ones in other categories, for instance:

- information on the expected date of commissioning is available only for 15% of the TPP components, compared to 71% of the investment components in other categories;
- information on the status of the investment is available only for 44% of the TPP components, compared to 87% of investments in other categories.

Based on this finding, the Agency has focused its monitoring activity on the time aspects (Sections 4, 5 and 6 of this Opinion) for TYNDP, REG and OTHER[11] investment components.

3. Creation of interconnector capacity

Based on available data, the Agency has analysed the implementation of 125 investment components (69 interconnector and 56 internal investment components) for which information regarding an increase in XB GTC was provided by NRAs. The Agency notes that out of these 125 investment components, 12 have already been commissioned.

Details about the expected increase in XB GTC for the 113 investment components which are not yet commissioned are presented in the Annex to this Opinion (60 interconnector components in Table I and 53 internal components in Table II). Furthermore, 12 investment components (4

[11] OTHER investment components are not monitored in Sections 5 and 6 because they do not exist in 2012 EU TYNDP, therefore it is not possible to assess progress.

interconnector investment components and 8 internal investment components) reported an impact on a border without information on the value of XB GTC increase. The Agency also notes that 62 investment components have XB GTC value assigned at cluster level[12], while 63 have XB GTC value assigned at individual investment level.

The summary of the expected XB GTC increase per country and per border is shown in Table 2.

Table 2: Planned increases in XB GTC (based on the available information)

Country	XB GTC expected increase (MW)	Impacted border	Total expected increase of XB GTC per country (MW)
AT	1000	AT-IT	1000
BE	1300 (at cluster level)[13]	NL-BE	4700
	1000	BE-FR	
	400	BE-LU	
	1000 (cluster)[14]	BE - GB	
	1000	BE - DE	
BG	1100 (cluster)[15]	BG-GR and BG-TR	3900
	1000	BG-RO	
	1800		
DE	600 GTC	DE-DK	14500
	1000 GTC (cluster)[16]		
	1400 GTC	DE-NO	
	500 GTC	DE-PL, PL-CZ, DE-CZ	
	500 GTC		
	500 GTC	DE-NL, DE-FR	
	1000 GTC; 500 GTC	DE-DK-NO; DE-AT-CH	
	2000 GTC (cluster)[17]	DE-AT	
	2000 GTC	DE-BE	

[12] XB GTC at cluster level means that the increase in XB GTC (e.g. 1000 MW) is provided for instance as the complementary effect of two investments. In such a case, the XB GTC increase - when provided by the relevant NRAs - is presented as "1000 (cluster)" for each investment component belonging to the two investments. The "cluster" does not necessarily correspond to the (clustered) projects of pan-European significance in the EU TYNDP 2012 and to increase of GTC thereof.

[13] The XB GTC increase at cluster level refers to 7 investment components on the Belgian side: Zandvliet (BE) - Lillo (BE) - Mercator (BE), Gramme (BE) - Van Eyck (BE) and Horta (BE) - Doel/Mercator (BE) , substations Lillo (BE) and Van Eyck (BE) and phase shifting transformer (PST) in Zandvliet substation.

[14] The XB GTC increase at cluster level refers to 2 investment components on the Belgian side: Zomergem (BE) - Zeebrugge (BE) - border with Great Britain / Richborough.

[15] The XB GTC increase at cluster level refers to 3 investment components on the Bulgarian side: Maritsa East 1 (BG) - Maritsa East 3 (BG) and Plovdiv (BG) - Maritsa East 1 (BG) - border with Greece / Nea Santa.

[16] The XB GTC increase at cluster level refers to 3 investment components on the German side: Dollern (DE) - Hamburg/Nord (DE) - Audorf (DE) - Border with Denmark / Kassö.

[17] The XB GTC increase at cluster level refers to 1 investment component on the German side: Isar (DE) - Border with Austria / St. Peter

Country	XB GTC expected increase (MW)	Impacted border	Total expected increase of XB GTC per country (MW)
	1500 GTC	DE - PL	
	1500 GTC		
	1500 GTC	DE - NL	
DK	600	DK-DE	4200
	1000 (cluster)[18]		
	1200		
	700	NO-DK	
	700	DK-NL	
EE	550[19] (cluster)	EE-LV	550
ES[20]	1400	ES-FR	1700 to 1800
	From 300 to 400	ES-PT	
FI	500	FI-SE	500
FR	1200	FR-ES	10300 / 10800
	1200		
	1000 / 1500	FR-CH / CH - FR	
	1000	FR-BE	
	1000	FR-GB	
	1000		
	1000		
	700	FR-IE	
	1200	FR-IT	
	1000	FR-DE	
HR	504	HR-BA	1253
	215		
	154		
	30		
	50		
	200		
	100	HR-SI	

[18] The XB GTC increase at cluster level refers to 2 investment components on the Danish side: Tjele (DK) - Kassö (DK) - Border with Germany / Audorf. According to DERA, a capacity increase will also affect DK-NO border.
[19] The XB GTC increase at cluster level refers to 3 investment components on the Estonian side: Harku (EE)- Sindi (EE) 110 kV circuit, Harku (EE)- Sindi (EE) 330 kV circuit and Kilingi-Nõmme (EE) – Border with Latvia/ Riga CHP2 substation.
[20] The XB GTC increases for Spain are per border. The value on the French border takes into account 5 investment components on the Spanish side: Santa Llogaia (ES) - Bescanó (ES) line, Santa Llogaia (ES) substation, Bescanó (ES) substation, Sta. Llogaia converter station, Sta.Llogaia (ES) – border with France / Baixas and does not include the subsea interconnector Gatica (ES) - Border with France / Aquitaine as this is not in Spanish national plan. The value on the Portuguese border is derived by deducting the capacity increase given by the commissioned investment (see Table 3).

Country	XB GTC expected increase (MW)	Impacted border	Total expected increase of XB GTC per country (MW)
HU	400 / 1100 (cluster)[21]	HU-SK / SK - HU	900 / 1600
	500 (cluster)[22]		
IE	1500	IE-GB	4700
	1000		
	1500	IE-NI	
	700	IE-FR	
IT[23]	1200 / 1000	FR- IT / IT-FR	7200 / 5680
	1600 / 1500	AT- IT / IT-AT	
	1000 / 950	CH - IT / IT-CH	
	600	IT – Northern Africa	
	1000	IT-ME	
	800 / 250	SI- IT / IT-SI	
	1000 / 380		
LT	500	LT-PL	1700
	500		
	700	LT-SE	
LU	400 (cluster)[24]	BE-LU	400
MT	200	MT-IT	200
NL	700	NL-DK	2200
	1500	NL-DE	
NO	1400	NO-DE	3500
	700	NO-DK	
	1400	NO-GB	
PL	500 1500 (cluster)[25]	PL-DE/CZ/SK DE/CZ/SK-PL	3000
	1500 500 (cluster)[26]	PL-DE/CZ/SK DE/CZ/SK-PL	

[21] The XB GTC increase at cluster level refers to 2 investment components on the Hungarian side: Gonyü area (HU) - Border with Slovakia / Gabcikovo and Sajóivánka (HU) - Border with Slovakia / Rimavská Sobota.
[22] The XB GTC increase at cluster level refers to 1 investment component on the Hungarian side: Area of Kisvárda – Border with Slovakia /Velké Kapušany
[23] Italian NRA inputs are per border with additional details on the French-Italian border (see at the end of Section 3).
[24] The XB GTC increase at cluster level refers to 2 investment components on the Luxembourgish side: (first step) phase shifting transformer in Schifflange (LU) and (second step) works on existing cable related to substations Bascharage and Schifflange (LU).
[25] The XB GTC increase at cluster level refers to 4 investment components on the Polish side: Plewiska (PL) - Border with Germany / Eisenhüttenstadt, Krajnik (PL) - Baczyna (PL), Mikulowa (PL) - Swiebodzice (PL) and substation Gubin (PL).
[26] The XB GTC increase at cluster level refers to 5 investment components on the Polish side: Krajnik (PL) - Border with Germany / Vierraden, switchgear in substation Krajnik, switchgear in substation Mikułowa, PST in substation Krajnik, PST in substation Mikułowa.

Country	XB GTC expected increase (MW)	Impacted border	Total expected increase of XB GTC per country (MW)
	500-1000 (cluster)[27]	PL-LT	
RO	425	RO-MD	1225
	800	RO-TR	
SE	700 (cluster)[28]	SE-LT	1500 / 1200
	800 / 500	SE-FI / FI-SE	
SI	indicative value 1000[29]	SI - IT	4640
	indicative 1640[30]		
	indicative 2000	SI-HU	
SK	1100 / 400 (cluster)[31]	SK-HU / HU-SK	1600 / 900
	500 (cluster)[32]		

Table 3 presents the 12 commissioned investment components (corresponding to 8 investment items, as four items are interconnectors between Member States commissioned on both sides, thus composed of two components each) which resulted in an increase in XB GTC:

- three Estonian and Finnish investment items of EstLink II, which became commercially operational in February 2014;
- the East-West Interconnector (Ireland-Great Britain);
- the "Southern Interconnection" Puebla de Guzman - Tavira (Spain-Portugal), which was commissioned in May 2014;
- two reinforcements (reconductoring or upgrades) of existing lines on the French-Italian border and on Croatian-Bosnian border and the Ołtarzew substation in Poland.

For the 12 commissioned investment components, as far as the comparison is possible taking into account that some capacities are at cluster level, the Agency notes that there are no differences

[27] The XB GTC increase at cluster level refers to 13 investment components on the Polish side: Siedlce Ujrzanów (PL) - Milosna (PL), Elk (PL) - Lomza (PL), substation Lomza (PL), switchgear in substation Ostroleka, Ostroleka (PL) - Narew (PL), Ostroleka (PL) - Stanislawów (PL), substation Stanisławów, Kozienice (PL) - Siedlce Ujrzanów (PL), Kozienice substation, Plock (PL) - Olsztyn Matki (PL), Olsztyn Mątki substation, Ostroleka (PL) - Olsztyn Matki (PL) and Elk (PL) - Border with Lithuania / Alytus. The increase is 500 MW in a first stage and 1000 MW after a second stage. The XB GTC increase at investment level for Elk (PL) - Border with Lithuania / Alytus is 400 MW.

[28] The XB GTC increase at cluster level refers to 1 investment component on the Swedish side: Nybro (SE) - Border with Lithuania / Klaipeda

[29] According to AGEN-RS, the NTC values provided are only indicative, the future conditions in neighbouring countries are not considered in calculations. Therefore, the final NTC values on the Slovene borders will have to be bilaterally/multilaterally harmonized (or using Pentalateral procedure) between ELES and TSOs of neighbouring countries, so that the final values may vary significantly from the indicative values above.

[30] The XB GTC increase at cluster level refers to 3 investment components on the Slovenian side: Divaca (SI) - Cirkovce (SI), phase shifting transformer in Okroglo (SI) and Okroglo (SI) - Border with Italy / Udine.

[31] The XB GTC increase at cluster level refers to 3 investment components on the Slovakian side: Gabcikovo - Border with Hungary / Gonyü area, Rimavská Sobota -Border with Hungary / Sajóivánka and Velký Dur (SK) - Gabcíkovo (SK).

[32] The XB GTC increase at cluster level refers to 2 investment components on the Slovakian side: Lemešany (SK) - Velké Kapušany (SK) and Velké Kapušany -Border with Hungary / Area of Kisvárda.

between the XB GTC increase reported by NRAs and the grid transfer capability increase available in Annex I to the 2012 EU TYNDP.

The total increase in interconnector capacity for the commissioned investment items is 1550-2250 MW. Furthermore, the full availability of 1000 MW on the Polish-Lithuanian border and of 600 MW on the French-Italian border depends on the completion of clusters of investments.

Table 3: Actual increases in XB GTC for commissioned investment components

TYNDP Investment Item Code	Substation 1	Substation 2	Investment description	XB GTC actual increase (MW)	Impacted border
4.17	Puebla de Guzman (ES)	Border with PT (Tavira)	New southern interconnection. New 400kV OHL single-circuit line between Puebla de Guzman (ES)- Tavira (PT)	300-400	ES to PT
4.17	Border with ES (Puebla de Guzman)	Tavira (PT)	As above (PT component)	On average about 1000[33]	PT to ES
21.54	Cornier (FR)	Border with IT (Piossasco)	Replacement of conductors (by ACCS) on various lines from Cornier (FR) to Piossasco (IT) (Total length of lines : 257 km)	600	FR-IT
21.54	Border with FR (Cornier)	Piossasco	As above (IT component)	600 (at cluster level)[34]	IT-FR
28.228	Border with BA (Trebinje)	Plat(HR)	Re-establishment of two previously existing 220kV single circuit interconnection Trebinje(BA)-Plat(HR); Total length 10km.	100	HR-BA
59.372	Oltarzew (PL)		A new AC substation will be connected by splitting 400kV line Rogowiec-Miłosna and Miłosna-Płock and 220kV line Mory-Sochaczew and Mory-Janów.	1000(cluster)[35]	PL-LT
63.391	Anttila (FI)		A new HVDC (450kV) connection will be built between Estonia and Finland. New substation Anttila part.	650 (at cluster level)	EE-FI
63.391	Püssi (EE)	Border with FI (Anttila)	As above. Marine cable		
63.391	Border with EE (Püssi)	Anttila (FI)	As above (FI component). Marine cable		
63.391	(FI)	Anttila (FI)	As above. DC overhead line part.		
80.461	Woodland (IE)	Border with GB (Deeside)	A new 260 km HVDC (200 kV DC) underground and subsea connection between Ireland and Britain with 500MW capacity.	500	IE-GB

[33] The increase in XB GTC varies according to peak / off-peak conditions and to the period of the year.
[34] This is the value at cluster level, including other reinforcements and in particular the Trino – Lacchiarella Italian internal line.
[35] This value is at cluster level including the investments described in Table 2 (see footnote for the PL-LT cluster).

TYNDP Investment Item Code	Substation 1	Substation 2	Investment description	XB GTC actual increase (MW)	Impacted border
80.461	Border with IE (Woodland)	Deeside (GB)	As above (IE component)		

4. Status of investments

In this Opinion, the following investment statuses as defined by the 2012 EU TYNDP are considered:

- "under consideration",
- "planned",
- "design and permitting",
- "under construction", and
- "commissioned"[36].

Further, the "cancelled" status is considered.

4.1 Status of the TYNDP, REG and OTHER investments

The analysis regarding the status of the TYNDP, REG and OTHER investments has been carried out for 679 investment components, as no information was reported for the other 104 investment components.

For the purpose of comparison with 2012 EU TYNDP data, the analysis of the status has been carried out separately for TYNDP, REG and OTHER investments.

TYNDP

Out of the total 566 TYNDP investment components for which information is available, the Agency has found that 13% are currently "under consideration", 24% are "planned", 36% are in the design and permitting phase, 13% are in the construction phase, 11% have been commissioned and 3% have been cancelled (Figure 1). Compared to the status of the 2012 EU TYNDP investments summarised in Figure 2[37], the Agency observes a significant reduction of the TYNDP investments

[36] This status is intended as "completed" for the investment components of interconnection lines: when only one of the investment components is completed, it cannot be commissioned yet due to the lack of completion on the other side.

[37] Figure 2 refers to 648 investment components instead of 656 due to the lack of information on the status of Magenta (IT) substation and as the commissioned status of some projects in Spain is not included:

- Magenta substation was included in 2012 EU TYNDP as a sub-investment of investment item 21.81 Trino (IT) - Lacchiarella (IT), which included a voltage upgrade of the existing Magenta 220 / 132 kV substation up to 380 kV. After the definition of the new interconnection project between Italy and Switzerland (HVDC link between Pallanzeno and Baggio), Magenta substation also supports the new interconnection project. ENTSO-E therefore classified Magenta substation as part of cluster 31, under item code 31.932, in the 2013 TYNDP Monitoring Update.

in the "Design and Permitting" status (see further analysis at the end of this Section). The Agency notes that 33% of the TYNDP investments which were "under construction" in 2012 have been commissioned.

Figure 1: The current status of the TYNDP investments

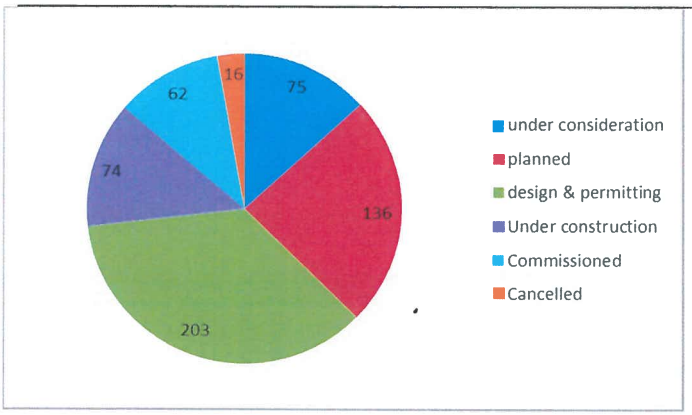
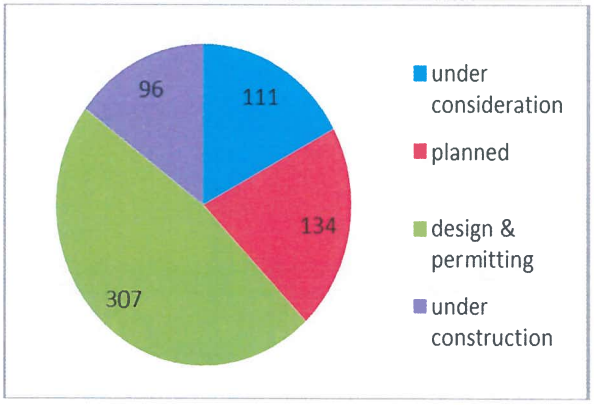


Figure 2: Status of TYNDP investments in 2012



REG

Out of the 101 REG investment components for which information is available, the Agency has found that 13% are currently "under consideration", 16% are "planned", 28% are in the design and permitting phase, 13% are in the construction phase, 14% have been commissioned and 16 % have been cancelled (Figure 3). Compared to the status of the 2012 REG investments summarised in Figure 4[38], the Agency observes a significantly higher percentage of cancelled investments compared to the TYNDP investments. The Agency notes that 67% of the REG investments which were "under construction" in 2012 have been commissioned.

- Bescanó substation is a sub-investment of TYNDP investment item 5.37 Santa Llogaia (ES) - Bescanó (ES). As indicated in the 2012 EU TYNDP, Appendix I, "Bescano-Vic / Senmenat 400 kV commissioned".
- Penagos, Udalla, Pesoz and Abanto substations in Spain are sub-investments of TYNDP investment item 6.22. As indicated in the 2012 EU TYNDP, Appendix I, Soto (ES) - Penagos (ES) and Zierbena (ES) - Abanto (ES) were commissioned. "Section Pesoz – Salas commissioned". "From Penagos / Aguayo to Udalla commissioned".
- Muruarte substation is a sub-investment of TYNDP investment item 7.23 Ichaso (ES) - Castejón (ES). As indicated in the brief description of the investment item in the 2012 EU TYNDP, Appendix I, "Section Castejón-Muruarte 400 kV is already in service".
- Arcos - Guadame is a sub-investment of TYNDP investment item 11.29 Cartuja (ES) – Guadame (ES). As indicated in the brief description of the investment item in the 2012 EU TYNDP, Appendix I, "Arcos - Cabra - Guadame section commissioned".

[38] Figure 4 refers to 108 investment components instead of 109 as Camporosso phase shifting transformer (IT) was commissioned before issuing the EU TYNDP 2012, as indicated in ENTSO-E "Regional Investment Plan Continental Central South - Final", 5 July 2012.

Figure 3: The current status of REG investments

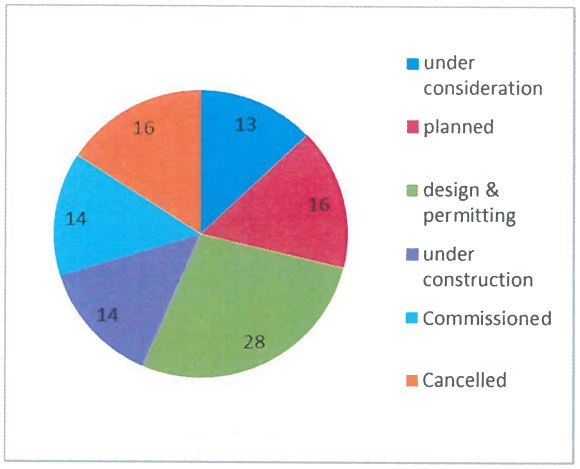
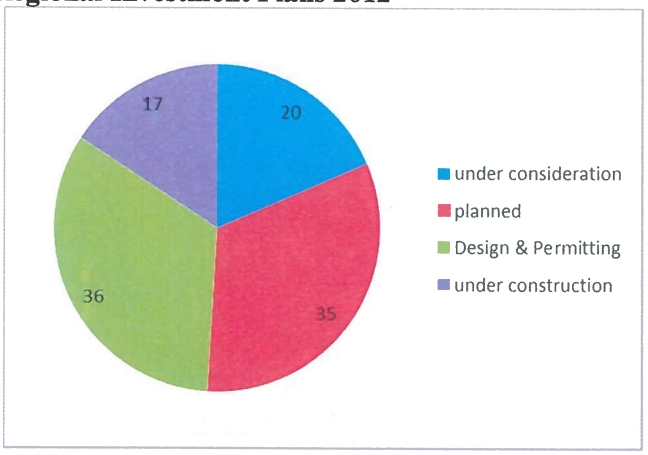
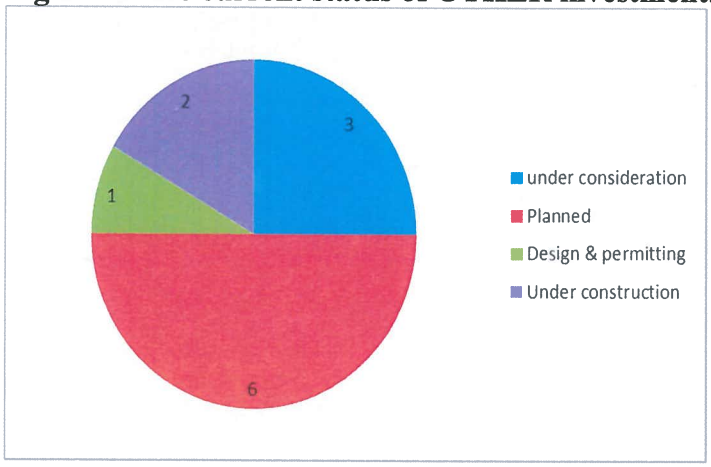


Figure 4: The status of REG investments in Regional Investment Plans 2012



The status of the 12 OTHER investment components for which information is available is presented in Figure 5[39].

Figure 5: The current status of OTHER investments



The Agency finally notes that 108 TYNDP and REG investment components have returned to an earlier status than the one in the 2012 EU TYNDP or Regional Investment Plans as illustrated in Table 4.

In particular, such situation applies to 42 Spanish TYNDP components, 21 Italian TYNDP and REG components and 9 Polish TYNDP and REG components. Furthermore, 4 components of interconnection investments have returned to an "under consideration" status:

- the AT component of Lienz (AT) - Veneto region (IT);
- the AT component of Area Bodensee (AT, CH, DE) – Area Bodensee (AT, CH, DE)

[39] A list of OTHER investments including the description and status for each investment components can be found in the Annex to this Opinion, Table XI.

- the BG component of Maritsa East 1 (BG) - Nea Santa (GR);
- the GB component of Kvilldal (NO) – tbd (GB).

Table 4: Investments which have returned to an earlier status compared to their 2012 status

Total number of investments	Status in 2012	Current status	Number of investments
10	under construction	Design & permitting	7
		Under consideration	1
		Planned	2
75	design & permitting	Under consideration	18
		Planned	57
23	planned	Under consideration	23

4.2 Investment components already commissioned

In total, 76 TYNDP and REG investment components have already been commissioned. This total includes about 10 investment components (more disaggregated than in the 2012 EU TYNDP) that were already commissioned before the 2012 EU TYNDP, as discussed in other parts of Section 4[40].

The Agency has found that 1 investment is only partly commissioned. Table 5 provides further details.

Table 5: Investment items only partly commissioned

TYNDP Investment Item Code	Country Code	Component / Investment item description	Status	Progress / commissioning date
27.223	SI	The existing substation of Cirkovce(SI) will be connected to one circuit of the existing Heviz(HU)-Žerjavinec(HR) double circuit 400kV OHL by erecting a new 80km double circuit 400kV OHL in Slovenia. The project will result in two new cross-border circuits: Heviz(HU)-Cirkovce(SI) and Cirkovce (SI)-Žerjavinec (HR).	Planned	Delayed / Not before 2018
	HR		Commissioned	On time
	HU		Design and permitting	On time / 2016

5. Timing and progress of implementation of investments

For the purpose of this Opinion, the term "investment rescheduled" corresponds to an investment which is voluntarily postponed by a transmission system operator due to changes of its external driver (e.g. postponed connection of new generation, lower demand, less urgent need for an investment due to updated planning data or priority to other transmission solutions).

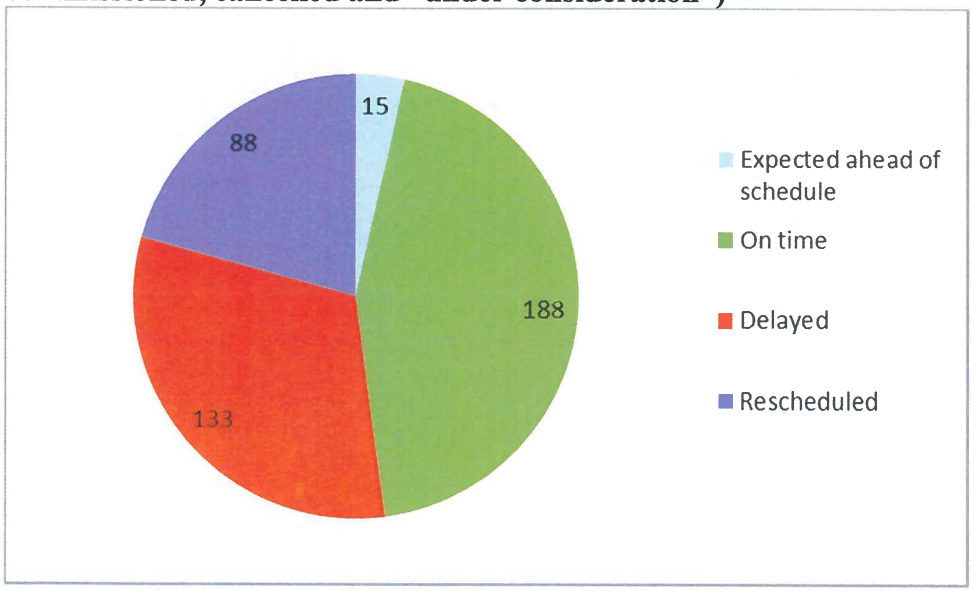
[40] For more details, see Table III in the Annex to this Opinion for the interconnector investment components, and Table IV in the Annex for the internal investment components.

The term "investment delayed" corresponds to an investment which is still needed at the expected date, but cannot be delivered on time due to various external factors like permitting, environmental, legislative reasons, etc.[41].
Considering that the availability of information about the expected timing and progress of investments is rather limited for the investment components "under consideration" compared to the other investment statuses, the Agency has decided not to include these investment components in its analysis. The analysis for commissioned investments is presented separately in Section 5.2.

5.1 TYNDP and REG investments (excluding commissioned investments)

Out of 569 TYNDP and REG investment components (information was missing for 145 investment components), 44% are 'on time', 31% encounter delays, 21% are rescheduled and 4% are expected ahead of schedule, as illustrated in Figure 6.

Figure 6: Progress of implementation of TYNDP and REG investments (excluding commissioned, cancelled and "under consideration")



5.2 Investment components already commissioned

Out of the 76 commissioned investment components, 24 components have been commissioned on time, 10 with a delay and 2 ahead of schedule. Information is not available for 40 components.

[41] Based on the input received, the Agency notes that postponing of some investments could have been due to multiple reasons in the delayed and rescheduled categories.

6. Analysis of the delayed, rescheduled and cancelled investments

This section presents the Agency's evaluation of the reasons for a delay, rescheduling and cancellation of investments.

6.1 Reasons for a delay

The Agency has identified 8 reasons why the implementation of investments has been delayed.

- Delays due to permit granting reasons;
- National law changes affecting permitting;
- Environmental problems and re-routing;
- Delays related to acquisition of land;
- Delays due to correlation with other delayed transmission investments;
- Delay in tendering process;
- Delay related to finalisation of agreements across borders or with third party promoters;
- Localisation and siting of substation(s).

Based on the detailed information presented in Figure I in the Annex[42], the Agency has found that 66% of the investment components are delayed due to permitting issues, environmental reasons and re-routing, siting of substations and national law changes affecting permitting[43].

6.2 Reasons for rescheduling

The Agency has identified 5 main reasons why the implementation of investments has been rescheduled:

- Changes on the generation side, including delays in the expected date of connection of new renewable-based generation;
- Changes due to correlation with other (prioritised or rescheduled) transmission investments;
- Changes on the demand side;
- Changes in planning data input;
- Rescheduling of works during the construction phase either to guarantee the continuity of service or due to other technical issues;

Based on the detailed information presented in Figure II in the Annex[44], the Agency has found that a significant proportion (58%) of investment components have been rescheduled due to changes on

[42] Information was available for 85% of the delayed investment components.
[43] A list of all investments encountering delays in their implementation and the detailed reasons for the delay can be found in the Annex to this Opinion. See Table V for interconnector investment components and Table VI for internal investment components.
[44] Information was available for 85% of the rescheduled investment components.

generation and demand side or changes in the overall planning data inputs. Next, 18% of rescheduling is related to priority given to other transmission investments[45].

6.3 Assessment of the cancelled investment components

As already reported in Section 4, the Agency has found that 32 investment components have been cancelled (16 TYNDP components and 16 REG components)[46].
The Agency has identified 7 main reasons why the implementation of the investments has been cancelled:

- Changes due to the overall planning process and inputs;
- Changes on the demand side;
- Changes on the generation side;
- Changes due to other transmission investments;
- Studies which never turned into a planned investment;
- Environmental reasons and re-routings;
- Investments becoming third party projects (thus cancelled from national plans).

Based on the detailed information presented in Figure III in the Annex[47], the Agency has found that a significant proportion (59%) of investment components has been cancelled due to changes on the generation or demand side or in the overall planning inputs. Next, 25% of investment components have been cancelled due to other transmission investments or because the study never turned into a planned investment.

7. Considerations in view of the forthcoming EU TYNDPs

The Agency acknowledges that the availability of data presented in this Opinion was limited, which is partly due to the novelty of the process, but also to the presentation of the grid transfer capacities at cluster level in the 2012 EU TYNDP. As already indicated in its Opinion on the ENTSO-E guideline for Cost-Benefit Analysis (CBA), the Agency, in line with the draft ENTSO-E CBA methodology[48], reaffirms the importance of including single-investment GTC increases in the 2014 EU TYNDP.

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[45] A list of all investments encountering a reschedule in their implementation and the detailed reasons can be found in the Annex to this Opinion. See Table VII for interconnector investment components and Table VIII for internal investment components.
[46] The increase in cancelled investments in comparison to the number of cancelled projects observed in the Agency opinion on national ten-year electricity network development plans (which reported 24 cancelled investment components) is related to the updates of some national plans and to new information provided by some NRAs. In particular, the Norwegian NRA informed the Agency that the investment 67.411 Rød (NO) - Sylling (NO) is not cancelled, but under consideration and rescheduled indefinitely. For detailed information see Annex to this Opinion, Table IX for interconnector investment components and Table X for internal investment components.
[47] Information was available for all the cancelled investment components.
[48] ENTSO-E, "Guideline to Cost Benefit Analysis of Grid Development Projects", 14 November 2013.

More generally, as already noted in its previous opinions[49], the Agency expects ENTSO-E to undertake a Cost-Benefit Analysis for all transmission investments in the 2014 EU TYNDP, in line with the currently available methodology. Such an analysis would allow for more information to be reported on in the forthcoming monitoring activities of the Agency, in particular with regard to the XB GTCs at investment item level[50] and with regard to the costs and benefits of each investment item.

The Agency considers that the ENTSO-E's 2013 TYNDP Monitoring Update has improved compared to the 2012 EU TYNDP in terms of clarity of the information provided (in the 2012 EU TYNDP the expected commissioning date for 194 investment components was not clearly defined – e.g. mid-term, long-term – and 18 investment items had no expected commissioning date). The Agency expects ENTSO-E to clearly and uniquely indicate the expected commissioning date in the 2014 EU TYNDP.

The Agency also considers that ENTSO-E should provide disaggregate information on each investment item (as ENTSO-E did in the 2013 TYNDP Monitoring Update, compared to the 2012 EU TYNDP). The presence of more disaggregated investments in the forthcoming EU TYNDPs will facilitate the future implementation monitoring of investments.

As already noted in its Opinion on National Ten-Year Network Development Plans[51], the Agency observes that in a few cases - in particular for investments under consideration - the 2012 EU TYNDP did not provide details or sufficient clarity in investment descriptions. The Agency calls on ENTSO-E to provide complete and clear descriptions in the 2014 EU TYNDP.

Done in Ljubljana on 30 July 2014.

For the Agency:

Alberto Pototschnig
Director

[49] Opinion of the Agency for the Cooperation of Energy Regulators No 17/2013 of 1 August 2013 on the 2012 ENTSO-E Annual Report
http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Opinions/Opinions/ACER%20Opinion%2017-2013.pdf

[50] According to ENTSO-E CBA Guidelines (p.20), "the Delta-GTC must be reported for each investment". Furthermore, in its Opinion on ENTSO-E TYNDP 2012, the Agency already recommended that costs are presented for each individual investment item inside each project cluster.

[51] Opinion of the Agency on National Ten-Year Network Development Plans, p. 8.

Annex I – Information on components of transmission investments

National Regulatory Authorities from 29 jurisdictions (AT, BE, BG, CY, CZ, DE, DK, EE, EL, ES, FI, FR, GB, HR, HU, IT, IE, LT, LU, MT, NI, NL, NO[52], PL, PT, RO, SE, SI, SK) participated in the process, providing their inputs on components of transmission investments by 27 June 2014. No contribution was received from LV.

Table I (Part A): Increases of interconnector capacity related to interconnector investment components

Country Code	TYNDP Investment Item Code	Substation 1	Substation 2	Status	Expected commissioning date	XB GTC expected increase (MW)	Impacted border
FR	5.36	Border with ES (Sta. Llogaia)	Baixas (FR)	Under construction	2015	1200	FR-ES
FR	16.38	Border with ES (Gatica)	Aquitaine (FR)	Under consideration	2020	1200	FR-ES
FR	21.55	Grande Ile (FR)	Border with IT (Piossasco)	Under construction	2018	1200	FR-IT
FR	22.57	Tbd (FR)	Border with CH (Tbd)	Under consideration	Before 2023	1000	FR-CH
FR	23.60	Avelin/Mastaing (FR)	Border with BE (Horta)	Under consideration	Before 2023	1000	FR-BE
BE	23.60	Border with FR (Avelin/Mastaing)	Horta (new 400-kV substation) (BE)	Under consideration	2018-2020	1000	FR – BE
FR	25.62	Tourbe (FR)	Border with GB (Chilling)	Design & permitting	2020	1000	FR-GB
AT	26.63	Lienz (AT)	Border with IT (Veneto region)	Under consideration	>2023	1000	AT-IT
SI	27.68	Okroglo (SI)	Border with IT (Udine)	Planned	>2020	indicative 1640 (cluster)	SI – IT
SI	27.223	Cirkovce (SI)	Border with HU (Heviz)	Planned	> 2018*	indicative 2000	SI-HU
HR	27.227	Border with BA (Banja Luka)	Lika (HR)	Under consideration	2020	504	HR-BA
SI	27.A96	Slovenia (SI)	Border with IT (Salgareda)	Planned	>2022	indicative 1000	SI-IT
DK	36.141	Ishøj / Bjæverskov (DK)	Border with DE (Bentwisch/Güstrow)	Design & permitting	2018	600	DK-DE
DE	36.141	Border with DK (Ishøj / Bjæverskov)	Bentwisch/Güstrow (DE)	Design & permitting	2018	600	DE-DK

[52] The Norwegian NRA participated in the framework of the Agency cooperation with NRAs of EU Member States.

Country Code	TYNDP Investment Item Code	Substation 1	Substation 2	Status	Expected commissioning date	XB GTC expected increase (MW)	Impacted border
NO	37.142	Tonstad (NO)	Border with DE (Wilster)	Design & permitting	2018	1400	NO-DE
DE	37.142	Border with NO (Tonstad)	Wilster (DE)	Design & permitting	2018	1400	DE-NO
DE	39.144	Audorf (DE)	Border with DK (Kassö)	Planned	2019	1000 (cluster)	DE-DK
DK	39.144	Border with DE (Audorf)	Kassö (DK)	Under consideration	2019	1000 (cluster)	DK-DE
BE	40.A29[53]	Border with LU (Bascharage)	Aubange (BE)	Under consideration	2020	400	BE-LU
DE	47.212	Isar (DE)	Border with AT (St. Peter)	Design & permitting	2018	2000 (cluster)	DE-AT
SK	48.214	Gabcikovo (SK)	Border with HU (Gonyü area)	Planned	2018	1100 (cluster) 400 (cluster)	SK-HU HU-SK
HU	48.214	Border with SK (Gabcikovo)	Gonyü area	Planned	2016	400 (cluster) 1100 (cluster)	HU-SK SK-HU
SK	48.A126	Rimavská Sobota (SK)	Border with HU (Sajóivánka)	Planned	2018	1 100 (cluster) 400 (cluster)	SK-HU HU-SK
HU	48.A126	Border with SK (Rimavska Sobota)	Sajóivánka (HU)	Planned	2016	400 (cluster) 1100 (cluster)	HU-SK SK-HU
BG	51.256	Maritsa East 1 (BG)	Border with GR (N.Santa)	Under consideration		1100 (cluster)	
SK	54.A127	Velké Kapušany (SK)	Border with HU (Area of Kisvárda)	Under consideration	2021	500 (cluster)	SK-HU
HU	54.A127	Border with SK (Velke Kapusany)	Area of Kisvárda (HU)	Planned	2021	500 (cluster)	HU, SK
DE	58.140	Eisenhüttenstadt (DE)	Border with PL (Plewiska)	Planned	2022	1500	DE-PL
PL	58.140	Border with DE (Eisenhüttenstadt)	Plewiska (PL)	Planned	2020	500 1500	PL->DE/CZ/SK DE/CZ/SK->PL
LT	59.368	Alytus (LT)	Border with PL (Elk)	Design & permitting	2015	500	LT-PL
PL	59.368	Border with LT (Alytus)	Elk (PL)	Under construction	2015	400 (500-1000 cluster)	LT-PL
LT	60.383	Klaipeda (LT)	Border with SE (Nybro)	Design & permitting	2015	700	LT-SE
SE	60.383	Border with LT (Klaipeda)	Nybro (SE)	Under construction	2015	700	LT-SE

[53] The investment 40.A29 is updated in the ENTSO-E 2013 TYNDP Monitoring Update with respect to the 2012 EU TYNDP

Country Code	TYNDP Investment Item Code	Substation 1	Substation 2	Status	Expected commissioning date	XB GTC expected increase (MW)	Impacted border
EE	62.386	Kilingi-Nomme (EE)	Border with LV (R-TEC2)	Design & permitting	2020	550 (cluster)	EE-LV
NO	70.426	Kristiansand (NO)	Border with DK (Tjele)	Under construction	2014	700	NO-DK
DK	70.426	Border with NO (Kristiansand)	Tjele (DK)	Under construction	2014	700	DK-NO
DK	71.427	Endrup (DK)	Border with NL (Eemshaven)	Design & permitting	2019	700	DK-NL
NL	71.427	Border with DK (Endrup)	Eemshaven (NL)	Design & permitting	2018	700	NL-DK
BE	74.443	Border with GB (Richborough)	Zeebrugge (BE)	Planned	Q2 2018	1000 (cluster)	BE - GB
IE	81.462	Woodland (IE)	Border with NI (Turleenan)	Design & permitting	2017	1500	IE-NI
DE	92.146	Aachen/Düren region (DE)	Border with BE (Lixhe)	Planned	2018	2000 (cluster)	DE-BE
BE	92.146	Border with DE (Aachen/Duren region)	Lixhe (BE)	Design & permitting	Q4 2018	1000	BE - DE
DE	94.139	Border with PL (Krajnik)	Vierraden	Under construction	2017	1500	DE-PL
PL	94.139	Krajnik (PL)	Border with DE (Vierraden)	Under construction	2016	1500 500	PL->DE/CZ/SK DE/CZ/SK->PL
DE	103.145	Niederrhein (DE)	Border with NL (Doetinchem)	Design & permitting	2016	1500 (cluster)	DE - NL
NL	103.145	Border with DE (Niederrhein)	Doetinchem (NL)	Design & permitting	2016	1500 GTC	NL-DE
IE	106.A34	Dunstown (IE)	Border with GB (Pentir)	Under consideration	after 2020	1000	IE-GB
IE	107.A25	Great Island or Knockraha (IE)	Border with FR (La Martyre)	Under consideration	2025	700	IE-FR
FR	107.A25	Border with IE (Great Island or Knockraha)	La Martyre (FR)	Under consideration	Beyond 2023	700	FR-IE
NO	110.424	Kvilldal (NO)	Border with GB (Tbd)	Design & permitting	2020	1400	NO-GB
FI	111.396	Finland North (FI)	Border with SE (Sweden bidding area SE1/SE2)	Under consideration	>2021	500	FI-SE
SE	111.396	Border with FI (Finland North)	Sweden bidding area SE1/SE2	Under consideration	2025	800/500	SE-FI/FI-SE
RO	267	Suceava (RO)	Border with MD (Balti)	Design & permitting	2020	425	RO-MD
RO	268	Constanta (RO)	Border with TR (Pasakoy)	Under consideration	>2020	800	RO-TR
FR	TPP	Calais (FR)	Border with GB (Folkestone)	Design & permitting	2016	1000	FR-GB

Country Code	TYNDP Investment Item Code	Substation 1	Substation 2	Status	Expected commissioning date	XB GTC expected increase (MW)	Impacted border
IE	TPP	Co. Offaly (IE)	Border with GB (Pembroke and Pentir)	Under consideration	n/a	1500	IE - GB
MT	OTHER	Malta	Border with IT (Ragusa area, Sicily)	Under construction	2014	200	MT-IT
LT	OTHER	LT	Border with PL	Design & permitting	2021	500	LT-PL
FR	OTHER	FR	Border with DE	Under consideration	Before 2023	1000	FR-DE
FR	OTHER	Cotentin (FR)	Border with GB (Exeter)	Under consideration	2022	1000	FR-GB

Table I (Part B): Unspecified increases of interconnector capacity related to interconnector investment components

Country Code	TYNDP Investment Item Code	Substation 1	Substation 2	Status	Expected commissioning date	XB GTC expected increase (MW)	Impacted border
AT	26.A102	Border with IT (Tbd)	Tbd (AT)	Under consideration	2020		AT-IT
DE	47.A76	Vöhringen / Leupolz (DE)	Border with AT (Westtirol)	Planned	2020		DE-AT
RO	50.238	Border with RS (Pancevo)	Resita (RO)	Design & permitting	2015		RO-RS
LT	381	Visaginas (LT)	Border with LV (Liksna)	Under consideration			LT-LV

Table II (Part A): Increases of interconnector capacity related to internal investment components

Country Code	TYNDP Investment Item Code	Substation 1	Substation 2	Status	Expected commissioning date	XB GTC expected increase (MW)	Impacted border
BE	24.60a	Lillo (BE)	Mercator (BE)	Design & permitting	Q4 2017	1300 (cluster)	NL-BE
BE	24.445	Zandvliet (BE)	Lillo (BE)	Design & permitting	Q4 2017	1300 (cluster)	NL-BE
BE	24.445	Lillo (BE)		Design & permitting	Q4 2017	1300 (cluster)	NL-BE
BE	24.445a	Van Eyck (BE)		Under construction	Jan. 2015	1300 (cluster)	NL-BE
BE	24.445a	Gramme (BE)	Van Eyck (BE)	Under construction	Jan. 2015	1300 (cluster)	NL-BE
BE	24.A26	Horta (BE)	Doel/Mercator (BE)	Design & permitting	2016-2020	1300 (cluster)	NL-BE
BE	24.A27	Zandvliet phase shifting transformer (BE)		Planned	2016	1300 (cluster)	NL-BE

Country Code	TYNDP Investment Item Code	Substation 1	Substation 2	Status	Expected commissioning date	XB GTC expected increase (MW)	Impacted border
SI	27.68	PST Okroglo (SI)		Planned	2022	indicative 1640 (cluster)	SI-IT
SI	27.225	Divaca (SI)	Cirkovce (SI)	Under construction	2025	indicative 1640 (cluster)	SI-IT
HR	27.A105	Lika (HR)	Brinje (HR)	Planned	2020	215	HR-BA
HR	27.A106	Lika (HR)	Velebit (HR)	Planned	2020	154	HR-BA
HR	28.A114	Konjsko (HR)	Velebit (HR)	Planned	2020	30	HR-BA
DK	39.428	Kassø (DK)	Tjele (DK)	Under construction	2014	1000 (cluster)	DK-DE and DK-NO
LU	40.446	PST Schifflange (LU)		Planned	2014	280 (cluster, first step)	BE-LU
LU	40.446	Bascharage - Schifflange (LU)		Under consideration	2015	400 (cluster)	BE-LU
DE	43.A75	Lauchstädt (DE)	Meitingen (DE)	Planned	2022	500 GTC	DE-PL; PL-CZ; DE-CZ
DE	43.A81	Osterath (DE)	Philippsburg (DE)	Planned	2019	500 GTC	DE-NL; DE-FR
DE	43.A88	Brunsbüttel, Wilster, Kreis Segeberg (DE)	Großgartach, Goldshöfe, Grafenrheinfeld (DE)	Planned	2022	1000 GTC; 500 GTC	DE-DK-NO; DE-AT-CH
DE	44.147	Dollern (DE)	Hamburg/Nord (DE)	Design & permitting	2015	1000 GTC (cluster)	DE-DK
DE	44.148	Audorf (DE)	Hamburg/Nord (DE)	Design & permitting	2017	1000 GTC (cluster)	DE-DK
DE	45.153	Redwitz (DE)	Grafenrheinfeld (DE)	Design & permitting	2014	500 GTC	DE-PL; PL-CZ; DE-CZ
SK	48.298	Velký Dur (SK)	Gabcíkovo (SK)	Under construction	2016	1100 (cluster) 400 (cluster)	SK-HU HU-SK
BG	51.257	Maritsa East 1 (BG)	Plovdiv (BG)	Design & permitting	2018	1100 (cluster)	BG-GR and BG-TR
BG	51.258	Maritsa East 1 (BG)	Maritsa East 3 (BG)	Design & permitting		1100 (cluster)	BG-GR and BG-TR
SK	53.A134	Lemešany (SK)	Velké Kapušany (SK)	Under consideration	2023	500 (cluster)	SK-HU
PL	58.353	Krajnik (PL)	Baczyna (PL)	Planned	2020	500 1500	PL->DE/CZ/SK DE/CZ/SK->PL
PL	58.355	Mikulowa (PL)	Swiebodzice (PL)	Planned	2020	500 1500	PL->DE/CZ/SK DE/CZ/SK->PL

Country Code	TYNDP Investment Item Code	Substation 1	Substation 2	Status	Expected commissioning date	XB GTC expected increase (MW)	Impacted border
PL	58.A67	Gubin (PL)		Planned	2020	500 1500	PL->DE/CZ/SK DE/CZ/SK->PL
PL	59.369	Siedlce Ujrzanów (PL)	Milosna (PL)	Design & permitting	2015	1000 (cluster)	PL/LT
PL	59.370	Elk (PL)	Lomza (PL)	Design & permitting	2015	1000 (cluster)	PL/LT
PL	59.370	Lomza (PL)		Under construction	2015	1000 (cluster)	PL/LT
PL	59.371	Ostroleka (PL)		Under construction	2015	1000 (cluster)	PL/LT
PL	59.371	Ostroleka (PL)	Narew (PL)	Under construction	2014	1000 (cluster)	PL/LT
PL	59.373	Ostroleka (PL)	Stanislawów (PL)	Planned	2020	1000 (cluster)	PL/LT
PL	59.373	Stanislawów (PL)		Under construction	2019	1000 (cluster)	PL/LT
PL	59.374	Kozienice (PL)	Siedlce Ujrzanów (PL)	Design & permitting	2019	1000 (cluster)	PL/LT
PL	59.374	Kozienice (PL)		Planned	2019	1000 (cluster)	PL/LT
PL	59.375	Plock (PL)	Olsztyn Matki (PL)	Planned		1000 (cluster)	PL/LT
PL	59.375	Olsztyn Matki (PL)		Planned	2018	1000 (cluster)	PL/LT
DK	72.430	Revsing (DK)	Landerupgård (DK)	Planned	2021	1200	DK/DE
EE	62.388	Harku (EE) 110 kV	Sindi (EE)	Design & permitting	2020	550 (cluster)	EE-LV
EE	62.388	Harku (EE) 330 kV	Sindi (EE)	Design & permitting	2020	550 (cluster)	EE-LV
BE	75.444	Zomergem (BE)	Zeebrugge (BE)	Design & permitting	Q1 2016	1000 (cluster)	BE-GB
PL	94.A68	Switchgear Krajnik (PL)		Design & permitting	2017	1500 500	PL->DE/CZ/SK DE/CZ/SK->PL
PL	94.A69	Switchgear Mikulowa (PL)		Design & permitting	2016	1500 500	PL->DE/CZ/SK DE/CZ/SK->PL
PL	94.A70	PST Krajnik (PL)		Under construction	2016	1500 500	PL->DE/CZ/SK DE/CZ/SK->PL
PL	94.A71	PST Mikulowa (PL)		Under construction	2016	1500 500	PL->DE/CZ/SK DE/CZ/SK->PL
BG	95.265	Vidno (BG)	Svoboda (BG)	Under consideration	2019	1000	BG-RO
BG	95.A119	Dobrudja (BG)	Burgas (BG)	Under consideration	2020	1800	BG-RO
PL	100.335	Ostroleka (PL)	Olsztyn Matki (PL)	Design & permitting	2017	1000 (cluster)	PL-LT
HR	OTHER	Tumbri (HR)	Veleševac (HR)	Planned	2023	100	HR-SI
HR	OTHER	Nova Sela (HR)	Plat (HR)	Planned	2023	50	HR-BA
HR	OTHER	Lika (HR)	Melina (HR)	Planned	2023	200	HR-BA

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Table II (Part B): Unspecified increases of interconnector capacity related to internal investment components

Country Code	TYNDP Investment Item Code	Substation 1	Substation 2	Status	Expected commissioning date	XB GTC expected increase (MW)	Impacted border
AT	26.47.216	St. Peter (AT)	Tauern (AT)	Design & permitting	2019		AT-DE
HU	48.A127	Reactor Sajóivánka (HU)		Planned	2016		HU, SK
HU	48.A127	Transformer Sajóivánka (HU)		Planned	2016		HU, SK
BG	51.262	Maritsa East 1 (BG)	Burgas (BG)	Under consideration	2019		BG-GR and BG-TR
RO	53.271	Medgidia S (RO)	Rahman(RO)-Dobrudja(BG) split	Design & permitting	2016		RO-BG
RO	53.272	Medgidia S (RO)	400 kV OHL Stupina (RO)-Varna (BG) split	Design & permitting	2016		RO-BG
NO	407	Tonstad (NO)	Arendal (NO)	Design & permitting	2020/2022		(NO, UK, DE)
NO	A61	Samnanger (NO)	Sauda (NO)	Planned	2021		(NO, DE, UK)

Table III: List of commissioned interconnector investment components

Country Code	TYNDP Investment Item Code	Substation 1	Substation 2	Progress in country	Commissioning date
ES	4.17	Puebla de Guzman (ES)	Border with PT (Tavira)	Delayed	2014
PT	4.17	Border with ES (Puebla de Guzman)	Tavira (PT)	Ahead of schedule	2011 (completed)
FR	21.54	Cornier (FR)	Border with IT (Piossasco)	On time	2012
IT	21.54	Border with FR (Cornier)	Piossasco (IT)		2013
HR	27.223	Cirkovce (SI)	existing line to Žerjavinec (HR)	On time	
HR	28.228	Border with BA (Trebinje)	Plat (HR)	On time	2014
EE	63.391	Püssi (EE)	Border with FI (Anttila)	On time	
FI	63.391	Border with EE (Püssi)	Anttila (FI)	On time	2014
IE	80.461	Woodland (IE)	Border with GB (Deeside)	On time	2013
GB	80.461	Border with IE (Woodland)	Deeside (GB)		
FR	61	Moulaine (FR)	Border with LU (Belval)		
LU	61	Border with FR (Moulaine)	Belval (LU)	Delayed	Oct 2013

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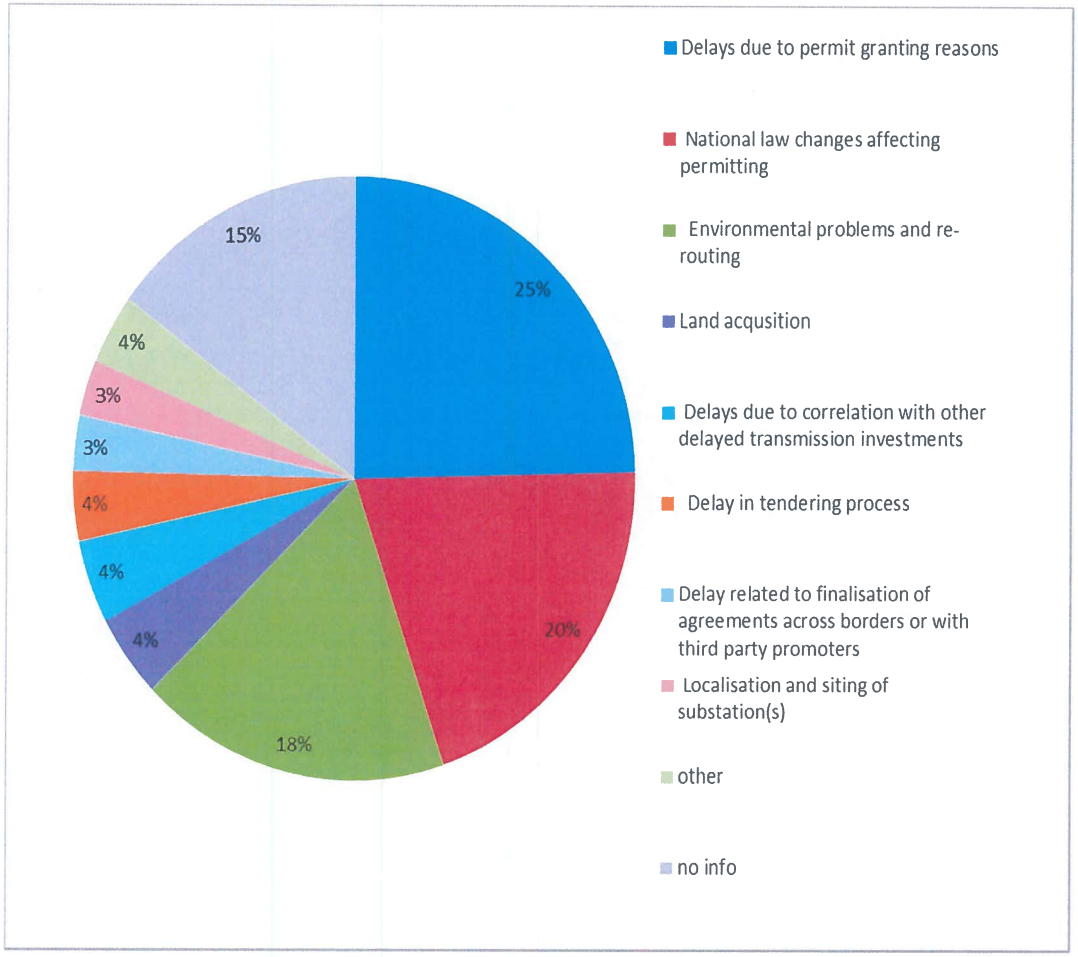
Table IV: List of commissioned internal investment components

Country Code	TYNDP Investment Item Code	Substation 1	Substation 2	Progress in country/EU	Commissioning date
PT	3.14	Marateca (PT)	Fanhões (PT)		2012
PT	4.16	Lagoaça (PT) (By Armamar)	Recarei (PT) (By Armamar)	Delayed	2013
ES	4.17	P.Guzman (ES)			2013
ES	4.17	Guillena (ES)	Puebla de Guzman (ES)		2009
ES	4.21	Aldeadavila (ES)	Villarino (ES)		2013
ES	4.21	JM Oriol (ES)	Caceres (ES)		2010
ES	5.19	Vic (ES)	Pierola (ES)		2012
ES	5.36	Sta.Llogaia (ES)		On time	2014
ES	5.37	Bescano (ES)		On time	2011
ES	5.37	Santa Llogaia (ES)		Delayed	2014
FR	5.46	Baixas (FR)	Gaudière (FR)	On time	2013
ES	6.22	Grado (ES)		Delayed	2013
ES	6.22	Penagos (ES)			2010
ES	6.22	Udalla (ES)			2011
ES	6.22	Pesoz (ES)			2011
ES	6.22	El Palo (ES)			2011
ES	6.22	Abanto (ES)			2010
ES	7.23	Muruarte (ES)			2008
ES	7.24	Muniesa (ES)			2013
ES	7.24	Mezquita (ES)		-	2011
ES	8.A8	Puigpelat (ES)	Penedes (ES)		2013
ES	9.26	Catadau (ES)			2010
ES	10.33	Manzanares (ES)			2012
ES	10.33a	Manzanares (ES)	Brazatortas (ES)		2012
ES	10.33a	Brazatortas (ES)			2012
ES	10.33a	Arcos (ES)	Guadame (ES)		2010
ES	14.34	Trives (ES)	Tordesillas (ES)		2012
ES	14.34	Aparecida (ES)			2012
ES	14.34b	PST Galapagar (ES)			2012
ES	14.34e	Mudarra (ES)	Tordesillas (ES)	-	2012
FR	17.45	Taute (FR)	Oudon (FR)	On time	2012
FR	18.48	Gaudière (FR)	Rueyres (FR)		2012
IT	21.81	Trino (IT)	Lacchiarella (IT)		2014

Country Code	TYNDP Investment Item Code	Substation 1	Substation 2	Progress in country/EU	Commissioning date
SI	27.224	Krsko (SI)	Bericevo (SI)	On time	2014
IT	28.86	PST Villanova (IT)			2012
HR	28.A115	Plat (HR)		On time	2014
IT	30.87	Feroleto (IT)	Maida (IT)		2013
IT	32.96a	New 380 kV substations for RES (IT)			2012
IT	32.A99	Aliano (IT)			2012
NO	37.408	Kristiansand, Feda (NO)		On time	
DE	44.181	Dauersberg (DE)	Limburg (DE)		2012
AT	47.221	St. Peter (AT)	Ernsthofen (AT)	Delayed	2014
AT	47.221	St. Peter (AT)		Delayed	2014
AT	47.221	Ernsthofen (AT)		Delayed	2014
PL	59.372	Oltarzew (PL)		Ahead of schedule	2014
FI	63.391	Anttila (FI)		On time	2014
EE	63.391	Püssi (EE)	(EE)	On time	2014
FI	63.391	(FI)	Anttila (FI)	On time	2014
FI	64.392	Yllikkälä (FI)	Huutokoski (FI)	On time	2013
GB	77.451a	Dounreay (GB)	Beauly (GB)	Delayed	2013
FR	89.A24	Brittany (FR)		On time	2013 (first stage as in EU TYNDP)
PL	101.338	Kozienice (PL)	Mory/ Piaseczno (PL)		
ES	27	Morvedre (ES)	Santa Ponsa (ES)		2012
FR	41	Fruges, Sud-Aveyron, Marne-Sud, Somme (FR)		On time (note: Sud-Aveyron delayed, Marne-Sud cancelled and Somme 'on time')	2013(Fruges) (note: Sud-Aveyron: 2017 and Somme: 2015)
FR	52	Feuillane (FR)	Realtor (FR)	On time	june 2012
IT	56	Camporosso (IT)			2011
DE	192	Hamburg/Krümmel (DE)	Schwerin (DE)		2012
GR	246	Aliveri (GR)	System (GR)	Delayed	2013
HU	279	Gyor (HU)	Martonvasar (HU)	On time	2012
HU	285	Debrecen (HU)		On time	2013
SK	296	Medzibrod (SK)	point of splitting (SK)		
PL	322	Kromolice (PL)			
NO	37.408	Kristiansand (NO)		On time	
NO	413a	Sima (NO)	Samnanger (NO)	On time	2013

Figure I - Main reasons for delayed investments



In addition to the reasons above, the category "other reasons" includes delays in construction works, technological reasons and financing reasons.

Table V: Delayed interconnection investments and related reasons

TYNDP Investment Item Code	Substation 1	Substation 2	Comm. date in TYNDP / REG	Country 1	Comm. date in Country 1	Country 2	Comm. date in Country 2	Reasons for delay Country 1	Reasons for delay Country 2
4.18	Fontefría (ES)	Vila do Conde (PT) (By Viana do Castelo)	2014	ES	2014	PT	2016	environmental reasons and re-routings	Delays in authorization process due to a change on the route and on the location of substations were induced by environmental concerns
5.36	Baixas (FR)	Sta.Llogaia (ES)	2014	FR	01.06.2015	ES	2015	delays in works (architectural treatment) on the substation	No investment progress reported
21.55	Grande Ile (FR)	Piossasco (IT)	2017/2018	FR	2019	IT	(blank)	The tendering process has been delayed due to a postponement of a few months. The project is now planned for 2019 (instead of 2018)".	No investment progress reported
27.223	existing line to Heviz (HU)	Cirkovce (SI)	2016	HU		SI	>2018	Investement reported on time	other permitting reasons
28.70	Villanova (IT)	Lastva (ME)	2015	IT	2017	ME		Rescheduling of work due to further secondary permitting during land rights acquisition and construction phase	(out of scope)
48.214	Gabcikovo (SK)	Gonyü area (HU)	2016	SK	2018	HU	2016	Expected commissioning date has been postponed due to slowly progressed negotiations between Slovak TSO SEPS, a. s. and Hungarian TSO MAVIR, ZRt. in identifying a location of the SK–HU border line crossing.	Investement reported on time

TYNDP Investment Item Code	Substation 1	Substation 2	Comm. date in TYNDP / REG	Country 1	Comm. date in Country 1	Country 2	Comm. date in Country 2	Reasons for delay Country 1	Reasons for delay Country 2
48.A126	Rimavská Sobota (SK)	Sajóivánka (HU)	2016	SK	2018	HU	2016	Expected commissioning date has been postponed due to slowly progressed negotiations between Slovak TSO SEPS, a. s. and Hungarian TSO MAVIR, ZRt. in identifying a location of the SK–HU border line crossing.	Investement reported on time
51.256	Maritsa East 1 (BG)	N.Santa (GR)	long term	BG		GR	2020	No investment progress reported	An agreement between the Greek and the Bulgarian TSO is still pending in order the project to move on.
71.427	Endrup (DK)	Eemshaven (NL)	2016	DK	2019	NL	2018	Investment reported as rescheduled	environmental reasons and re-routings
81.462	Woodland (IE)	Turleenan (NI)	2016	IE	2017	NI	(blank)	The project has been referred to an independent enquiry to assess whether any or all of the proposed AC OHL should be placed underground.	No investment progress reported
92.146	Aachen/Düren region (DE)	Lixhe (BE)	2017	DE	2018	BE	Q4 2018	No investment progress reported	Long procedures for the revision of the sector plan and for obtaining the permits.
94.139	Vierraden (DE)	Krajnik (PL)	long term	DE	2017	PL	2016	No investment progress reported	changes due to other transmission investments
230	TPP Sisak (HR)	Mraclin(HR)/ Prijedor(BA)	2012-2013	HR	2016	BA		Other permitting reasons	(out of scope)

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Table VI: Delayed internal investments and related reasons

Country Code	TYNDP Investment Item Code	Substation 1	Substation 2	Commissioning date in TYNDP /REG	Commissioning date in country	Reasons for delay
PT	1.1	V.Minho (PT)	Pedralva (PT)	2014	2015	environmental reasons and re-routings
PT	1.5	Macedo de Cavaleiros (By Valpaços) (PT)	Vila Pouca de Aguiar (By Valpaços) (PT)	2011/2012	2014	One of the sections of the line Valpaços-Vila Pouca de Aguiar found environmental problems in his original route. The problem was solved with the identification of a new route, prompting a delay in the commissioning date.
ES	4.18	Fontefria (ES)		2014	2016	other permitting reasons
ES	4.18	Beariz (ES)		2014		other permitting reasons
ES	4.18	Beariz (ES)	Fontefria (ES)	2014	2016	National law RDL 13/2012 has frozen the permitting process until publication of the next NDP
PT	4.18	Vila do Conde (PT)	Recarei/Vermoim (PT)	2014	2015	environmental reasons and re-routings
PT	4.18	V. Castelo (PT)		2014	2016	Delays in the authorization process, due to a change of location of the substation. Timing correlated to the new 400kV OHL Fontefría (ES) - Viana do Castelo (PT) - Vila do Conde (PT).
PT	4.18	Vila do Conde (PT)		2014	2015	Delays in the authorization process, due to a change of location of the substation. Timing correlated to the new double circuit 400kV OHL between Vila do Conde (PT) - Recarei/Vermoim (PT).
ES	4.21a	JM Oriol (ES)	Arenales-Caceres (ES)	2014	2016/2023	National Law RDL 13/2012 has frozeen the permiting process until publication of the the next NDP. The new cable Cáceres-Los Arenales 220 kV has been affected.
ES	4.21a	Arenales (ES)		2014	2017	National law RDL 13/2012 has frozen the permitting process until publication of the next ND
ES	5.20	Arkale (ES)	Hernani (ES)	2014	2014	
ES	5.37	Santa Llogaia (ES)	Bescanó (ES)	2011-2013	2014	other permitting reasons
ES	5.37	Ramis (ES)		2011-2013	2016	other permitting reasons
ES	6.22	Soto (ES)	Tabiella (ES)	2015	2017	National Law RDL 13/2012 has frozeen the permiting process until publication of the the next NDP. The new cable Cáceres-Los Arenales 220 kV has been affected.
ES	6.22	Gueñes (ES)	Ichaso (ES)	2016	2018	National Law RDL 13/2012 has frozeen the permiting process until publication of the the next NDP. The new cable Cáceres-Los Arenales 220 kV has been affected.

Country Code	TYNDP Investment Item Code	Substation 1	Substation 2	Commissioning date in TYNDP /REG	Commissioning date in country	Reasons for delay
ES	6.22	Gozón (ES)		2012-2014	2017	National Law RDL 13/2012 has frozeen the permiting process until publication of the the next NDP. The new cable Cáceres-Los Arenales 220 kV has been affected.
ES	6.22	Solorzano (ES)		2012-2014	2015	
ES	6.22	Penagos/Aguayo (ES)	Abanto (ES)	2012	2015	environmental reasons and re-routings
ES	6.22	Pesoz (ES)	Grado (ES)	2012-2014	2013	
ES	6.22	Sama (ES)		2012-2014		National Law RDL 13/2012 has frozeen the permiting process until publication of the the next NDP. The new cable Cáceres-Los Arenales 220 kV has been affected.
ES	6.22	Pesoz (ES)	Boimente (ES)		2016	National Law RDL 13/2012 has frozeen the permiting process until publication of the the next NDP. The new cable Cáceres-Los Arenales 220 kV has been affected.
ES	7.23	Ichaso (ES)	Castejón (ES)	2017		Section Dicastillo-Ichaso 400 kV has been affected by National law RDL 13/2012 which has frozen the permitting process until publication of the next NDP.
ES	7.23	Dicastillo (ES)		2017		National law RDL 13/2012 has frozen the permitting process until publication of the next NDP. By the moment this substation is rescheduled.
ES	7.23b	Aragón (ES)	Peñaflor (ES)	2013-2014	2016	other permitting reasons
ES	7.23b	La Serna (ES)	Ichaso (ES)	2013-2014	2014	other permitting reasons
ES	7.24	Teruel (ES)	La Plana(ES)	2012-2015		National Law RDL 13/2012 has frozeen the permiting process until publication of the the next NDP. The new cable Cáceres-Los Arenales 220 kV has been affected.
ES	7.A5	Dicastillo (ES)	Moncayo (ES)	2013-2017		National law RDL 13/2012 has frozen the permitting process until publication of the next NDP.
ES	8.25	Arnero (ES)		2014		National law RDL 13/2012 has frozen the permitting process until publication of the next NDP.
ES	8.25	Aragón (ES)	Isona (ES)	2014		National law RDL 13/2012 has frozen the permitting process until publication of the next NDP.
ES	8.25	Isona (ES)		2014		National law RDL 13/2012 has frozen the permitting process until publication of the next NDP.
ES	8.25a	Escatron (ES)	La Secuita (ES)	2015		National law RDL 13/2012 has frozen the permitting process until publication of the next NDP.

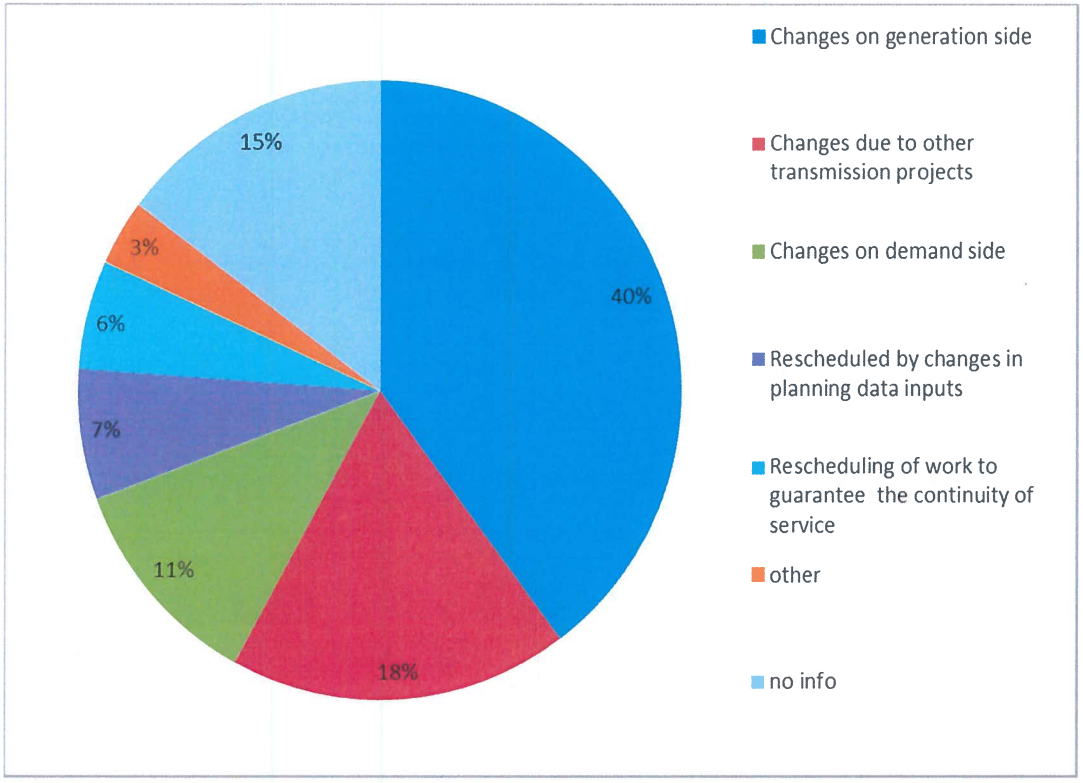
Country Code	TYNDP Investment Item Code	Substation 1	Substation 2	Commissioning date in TYNDP /REG	Commissioning date in country	Reasons for delay
ES	8.25a	Els Aubals (ES)		2015		National law RDL 13/2012 has frozen the permitting process until publication of the next NDP.
ES	8.A10	Isona (ES)	Calders (ES)	2015		National law RDL 13/2012 has frozen the permitting process until publication of the next NDP.
ES	8.A7	Mangraners (ES)	Begues (ES)	2013	2015	other permitting reasons
ES	8.A9	Garraf (ES)	Vandellos (ES)	2015		National law RDL 13/2012 has frozen the permitting process until publication of the next NDP.
ES	9.26a	Catadau (ES)	Jijona (ES)	2016-2019		
ES	11.29	Cartuja (ES)	Arcos (ES)	2011/2014	2015	National law RDL 13/2012 has frozeen the permiting process until publication of the the next NDP.
ES	11.29	Cartuja (ES)		2011/2014	2015	National law RDL 13/2012 has frozeen the permiting process until publication of the the next NDP.
ES	11.A11	Cartuja-Pto Sta Maria (ES)	Facinas (ES)	2012/2013		National Law RDL 13/2012 has frozeen the permiting process until publication of the the next NDP.
ES	12.30	Guadaira (ES)		2017		National Law RDL 13/2012 has frozeen the permiting process until publication of the the next NDP.
ES	12.30	Don Rodrigo (ES)	Guadaira (ES)	2017		National Law RDL 13/2012 has frozeen the permiting process until publication of the the next NDP.
ES	12.30a	Guillena (ES)	Almaraz (ES)	2012	2016	
ES	12.30a	Arroyo S.Servan (ES)		2012	2013	
ES	13.31	Caparacena (ES)	La Ribina (ES)	2016		National Law RDL 13/2012 has frozeen the permiting process until publication of the the next NDP.
ES	13.31	Baza (ES)		2016		National Law RDL 13/2012 has frozeen the permiting process until publication of the the next NDP.
ES	14.34	Trives (ES)	Tordesillas (ES)	2011-2012	2015	
ES	14.34a	Tordesillas (ES)	Galapagar (ES)	2012-2013	2015	
ES	14.34b	Moraleja (ES)	Galapagar-Segovia (ES)	2013-2015		The section Galapagar-Segovia 400 kV is under construction since jul 2008 and it´s on delayed. Expected commissioning date in national plan is 2015. The section Galapagar-Moraleja 400 kV has been rescheduled.
ES	14.34c	Loeches (ES)	SSReyes (ES)	2015		National law RDL 13/2012 has frozen the permitting process until publication of the next NDP.
ES	15.32	Aldeadavila (ES)	Almaraz (ES)	2011/2018	2016	
ES	15.32	Aldeadavila (ES)	Arañuelo (ES)	2011/2018	2016	

Country Code	TYNDP Investment Item Code	Substation 1	Substation 2	Commissioning date in TYNDP /REG	Commissioning date in country	Reasons for delay
ES	15.32	Villaviciosa (ES)	Almaraz (ES)	2011/2018	2015	
ES	15.32	Picon (ES)	T.Velasco (ES)	2011/2018	2014	
ES	15.32	Valdecaballeros (ES)	Arañuelo (ES)	2011/2018	2016	
ES	15.32	Trillo (ES)	Belinchon (ES)	2011/2018		
ES	15.32	Cofrentes (ES)	Morata (ES)	2011/2018		
ES	15.32	Añover (ES)	Villaverde (ES)	2011/2018		
ES	15.A12	T.Velasco (ES)		2016/2017 (cluster)	2015	
AT	26.47.216	St. Peter (AT)	Tauern (AT)	2017/2019	2019	Part 1 of the Project from St. Peter to Salzburg is already built and in operation. Part 2 is starting permitting phase. Delays are forseeable.
IT	26.93	Dolo (IT)	Camin (IT)	2014		other permitting reasons
IT	26.97	Polpet (IT)		2015	2017	other permitting reasons
IT	27.92	West Udine (IT)	Redipuglia (IT)	2015	2016	other permitting reasons
IT	28.70	HVDC Villanova (IT)		2015	2017	Land acquisition
IT	28.86	Foggia (IT)	Villanova (IT)	2015	2019	other permitting reasons
IT	30.77	Partinico (IT)	Fulgatore (IT)	2016	2020	other permitting reasons
IT	31.95	Mese (IT)		2014	2022	other permitting reasons
IT	31.99	Avise (IT)	Chatillon (IT)	2014	2022	other permitting reasons
IT	31.103	Brescia (IT)		mid term	2022	other permitting reasons
IT	32.88	Montecorvino (IT)	Benevento (IT)	mid term	2021	other permitting reasons
IT	32.96	Deliceto (IT)	Bisaccia (IT)	mid term	2017	other permitting reasons
IT	32.A99	Laino (IT)	Altomonte (IT)	2012/mid term	2017	other permitting reasons
IT	33.90	Calenzano (IT)	Colunga (IT)	mid term	2018	other permitting reasons
IT	33.113	Monte S. Savino (IT)		2015/long term	2022	environmental reasons and re-routings
CZ	35.306	Vitkov (CZ)		2017/2018	2020	other permitting reasons
CZ	35.307	Vernerov (CZ)		2013/2016	2017	other permitting reasons
LU	40.446	PST Schifflange (LU)		2016 (cluster)	2014	Difficulties about an agreement with a third party for the use of an existing infrastructure.
GR	51.244	Filippi (GR)	Lagadas (GR)	2013	2016	financing issues
GR	51.244	Lagadas (GR)		2013	2013	environmental reasons and re-routings

Country Code	TYNDP Investment Item Code	Substation 1	Substation 2	Commissioning date in TYNDP /REG	Commissioning date in country	Reasons for delay
GR	52.240	Patras (GR)	400 kV Continental System (GR)	2013	2016	environmental reasons and re-routings
GR	52.241	Patras (GR)	Megalopolis (GR)	2013	2016	environmental reasons and re-routings
GR	52.242	Korinthos (GR)		2014	2018	environmental reasons and re-routings
GR	52.242	Megalopolis (GR)	Korinthos (GR)	2014	2018	environmental reasons and re-routings
GR	52.243	Korinthos (GR)	Koymoyndoyros (GR)	2014	2019	environmental reasons and re-routings
RO	53.271	Medgidia S (RO)		2015	2016	changes due to other transmission investments
RO	53.271	400 kV Medgidia S (RO)	Rahman(RO)-Dobrudja(BG) split	2015	2016	environmental reasons and re-routings
RO	53.272	Medgidia S (RO)	400 kV OHL Stupina (RO)-Varna(BG) split	2015	2016	environmental reasons and re-routings
CZ	55.302	Vyskov (CZ)	Cechy stred (CZ)	2015	2016	other permitting reasons
CZ	55.303	Babylon (CZ)	Bezdecin (CZ)	2016	2018	other permitting reasons
CZ	55.304	Babylon (CZ)	Vyskov (CZ)	2018	2019	other permitting reasons
CZ	56.A92	Chodov (CZ)	Cechy stred (CZ)	2021	2024	environmental reasons and re-routings
EE	62.388	Harku 110 kV (EE)	Sindi (EE)	2018	2020	land acquisition
EE	62.388	Harku 330 kV (EE)	Sindi (EE)	2018	2020	land acquisition
SE	66.400	Ekhyddan (SE)	Barkeryd (SE)	2017	2019	environmental reasons and re-routings
NO	67.412	Rød (NO)-Sylling (NO)-Flesaker (NO)	Hasle (NO)Tegneby (NO)Tegneby (NO)	2015	2016	other permitting reasons
BE	75.444	Zomergem (BE)	Zeebrugge (BE)	2014	Q1 2016	environmental reasons and re-routings
IE	83.467	Moneypoint (IE)	Kilpaddoge (IE)	2014	2015	construction/manufacturing delays
IE	83.468	Moneypoint (IE)	North Kerry (IE)	2019	2019	technological issues
SE	87.A55	Forsmark (SE)	Stackbo (SE)	2018	2019	Delayed due to a longer than expected process for the environmental policy act
SE	93.398a	Sweden bidding area SE2+SE3		2015	2019	technological issues
NO	93.413	Ørskog (NO)	Sogndal (NO)	2015	2016	environmental reasons and re-routings
PL	94.A68	Switchgear Krajnik (PL)		2014	2017	delay in tendering process

Country Code	TYNDP Investment Item Code	Substation 1	Substation 2	Commissioning date in TYNDP /REG	Commissioning date in country	Reasons for delay
PL	94.A69	Switchgear Mikulowa (PL)		2014	2016	changes due to other transmission projects
PL	94.A70	PST Krajnik (PL)		2014	2016	changes due to other transmission projects
PL	94.A71	PST Mikulowa (PL)		2014	2016	delay in tendering process
PL	101.327	Kozienice (PL)	Oltarzew (PL)	2015	2017	Land acquisition delay
IT	112.106	Schio (IT)		mid term	2025	other permitting reasons ;Preliminary localization of new substation in accordance with local Authority, still to be decided
IT	110	Restructuring of Sorrento Peninsula network (IT)		2014		environmental reasons and re-routings
GR	248	Polypotamo (GR)	N. Makri (GR)	2013	31.12.2013	environmental reasons and re-routings
GR	249	Polypotamo (GR)	N. Evia (GR)	2013	31.12.2013	environmental reasons and re-routings
GR	250	Lavrio (GR)	Cyclades (GR)	2015	2016	delay in tendering process
HU	287	Albertirsa / God (HU)	Godollo (HU)	2015	2016	short delay due to difficulties with substation siting.
CZ	299	Krasikov (CZ)	Horni Zivotice (CZ)	2014	2016	other permitting reasons
PL	322	Kromolice (PL)	Pątnów (PL)	2012	2014	Land acquisition problems
PL	325	Krajnik (PL)	Pomorzany (PL)	2016	2018	delay in tendering process
PL	337	Radkowice (PL)	Kielce Piaski (PL)	2015	2016	other permitting reasons
PL	342	Czarna (PL)	Polkowice (PL)	2016	2018	delay in tendering process
IE	465	LAOIS-KILKENNY (IE)	Kilkenny	2014	2017	other permitting reasons
ES	A115	Torrente (Ibiza) (ES)	Formentera (ES)	2013/2017	2017	

Figure II - Main reasons for rescheduling of investments



In addition to the reasons above, the category "other reasons" includes multiple reasons and various circumstances, changes in the projects (including localisation of a phase shifting transformer).

Table VII: Rescheduled interconnection investments and related reasons

TYNDP Investment Item Code	Substation 1	Substation 2	Comm. date in EU TYNDP 2012	Country 1	Comm. date in Country 1	Country 2	Comm. date in Country 2	Reason for rescheduling Country 1	Reason for rescheduling Country 2
71.427	Endrup (DK)	Eemshaven (NL)	2016	DK	2019	NL	2018	Rescheduled to account for the time of the development of a solid regional business case and acceptance by the authorities of the preferred route.	Investment reported as delayed

Table VIII: Rescheduled internal investments and related reasons

Country Code	TYNDP Investment Item Code	Substation 1	Substation 2	Commissioning date in TYNDP /REG	Commissioning date in country	Reason for rescheduling
PT	1.2	Pedralva (PT)	Sobrado (PT)	2017	2020	Due to the expected delay of the connection of new RES generation in North of Portugal.
PT	1.4	V.Minho (by Ribeira de Pena) (PT)	Feira (by Ribeira de Pena) (PT)	2015/2016	2018	Due to the expected delay of the connection of new hydro power plants.
PT	1.4	Ribeira de Pena (PT)		2015/2016	2017	Due to the expected delay of the connection of new hydro power plants.
PT	1.6	V. P. Aguiar (by Carrapatelo) (PT)	Estarreja (by Carrapatelo) (PT)	2013	2017	Due to the expected delay of the connection of new RES generation in Portugal.
PT	1.A1	Ribeira de Pena (PT)	Guarda (PT)	2022	2025	Due to the expected delay of the connection of new RES generation in North and Center of Portugal.
PT	2.8	Seia (PT)		2015/2016	2021	Due to the expected delay on the connection of new RES generation in the Center of Portugal.
PT	2.8	Arganil/Góis (PT)		2015/2016	2025	Due to the expected delay on the connection of new RES generation in the Center of Portugal.
PT	2.9	Guarda (PT) (By Fundão)	Falagueira (PT) (By Fundão)	2015/2016	2017/2022	The section between Fundão and Falagueira will be in service in 2017, the section between Guarda and Fundao only in 2022. Adjustments resulting from the new date of renewables investments. Due to the expected delay on the connection of

Country Code	TYNDP Investment Item Code	Substation 1	Substation 2	Commissioning date in TYNDP /REG	Commissioning date in country	Reason for rescheduling
						new RES generation in the Center of Portugal, the commissioning date of this investment is postponed accordingly.
PT	2.9	Guarda (PT)		2015/2016	2022	Due to the expected delay on the connection of new RES generation in the Center of Portugal.
PT	2.9	Fundão (PT)		2015/2016	2017	Due to the expected delay on the connection of new RES generation in the Center of Portugal.
PT	2.10	Falagueira (PT)	Pego (PT)	2014	2019	Due to the expected delay on the connection of new RES generation in the Center of Portugal.
PT	2.A2	Seia (PT)	Guarda (PT)	2020	2025	Due to the expected delay on the connection of new RES generation in the Center of Portugal.
PT	3.12	Alm. Bispo (PT)		2016/2019	2021	Due to the downward review of the electrical consumption in Portugal.
PT	3.12	Rio Maior (by A.Bispo) (PT)	Fanhões (by A.Bispo) (PT)	2016/2019	2021	Due to the downward review of the electrical consumption in Portugal.
PT	3.14	Pegões (PT)		2012	2018	"Due to the downward review of the electrical consumption in Portugal.
ES	6.22	Gozon (ES)	Sama (ES)			The section Gozón-Reboira-Costa Verde has been rescheduled due to various circumstances. The Sama-Reboira (Carrio-Valle Nalon) has been affected by National law RDL 13/2012 which has frozen the permitting process until publication of the next NDP.
ES	6.22	Sama (ES)	Velilla (ES)	2015		
ES	6.22	Costa Verde (ES)		2012-2014		
ES	7.23a	La Serna (ES)	Magallón (ES)	2014		Replaced by other more critical investment
ES	7.23b	Tudela (ES)	Magallón (ES)	2013-2014		Rescheduled works due to other investments.
ES	7.24	Fuendetodos (ES)	Morella(ES)	2012-2015	2016	
ES	7.24	Platea (ES)		2012-2015		Rescheduled by changes in planning data inputs
ES	7.24	La Plana/Morella (ES)	Godelleta (ES)	2012-2015		Rescheduled by changes in planning data inputs
ES	7.24	Mudejar (ES)		2012-2015	2016	
ES	8.25a	La Secuita (ES)		2015		
ES	9.26	Jijona (ES)		2017		
ES	9.26	Catadau (ES)	Benajama (ES)	2017		Rescheduled by changes in planning data inputs
ES	10.28	Cofrentes (ES)	Ayora (ES)	2014	2016	
ES	10.28a	Ayora (ES)	Pinilla (ES)	2014	2015	

Country Code	TYNDP Investment Item Code	Substation 1	Substation 2	Commissioning date in TYNDP /REG	Commissioning date in country	Reason for rescheduling
ES	10.28a	Campanario (ES)		2012	2014	
ES	10.33	Romica (ES)	Manzanares (ES)	2016		Rescheduled by changes in planning data inputs
ES	11.29	Cordoba (ES)				Changes on demand side
ES	12.30a	Carmonita (ES)		2012	2016	Changes on demand side. Timing correlated to the High Speed Train needs
ES	13.31	La Ribina (ES)		2016		
ES	14.34d	Fuencarral (ES)	Galapagar (ES)	2014		Rescheduled by changes in some works
ES	14.34e	Mudarra (ES)	Tordesillas (ES)	2018		Rescheduled by changes in planning data inputs
ES	15.32	Morata (ES)	Almaraz (ES)	2011/2018		
ES	15.A12	Olmedilla (ES)	Valdemingomez (ES)	2016/2017		
ES	15.A12	Valdemingomez (ES)		2016/2017		
IT	26.66	PST Prati di Vizze (IT)		mid term		The PST will be installed in the new 132 kV substation of Brennero
HR	27.A107	Lika (HR)		2017	2020	changes due to other transmission projects
HR	28.231	Konjsko (HR)		2014	2016	changes due to other transmission projects
IT	30.75	Sorgente (IT)	Rizziconi (IT)	2014	2015	Rescheduling of 6 months work due to technical issues during construction phase
IT	31.100	Milan new cables (IT)		mid term	2019	Rescheduling of work to guarantee, during construction phase, the continuity of service in metropolitan area of Milan
IT	31.100	Milan reinforcements (IT)		mid term	2019	Rescheduling of work to guarantee, during construction phase, the continuity of service in metropolitan area of Milan
CZ	35.312	Mirovka (CZ)		long term	2020	changes on generation side
HU	48.A128	Reactor Gyor (HU)		2016	2018	changes in planning input data (demand side).
HU	48.A128	Transformer Gyor (HU)		2016	2018	changes in planning input data (demand side)
GR	52.240	Patras (GR)		2013	2020	Due to the delays and the on-going negotiations between the TSO and the local authorities (and also because it is facilitated by current demand reduction), the project is rescheduled for 2021.
RO	53.273	Cernavoda (RO)	Stalpu (RO) and Gura Ialomitei (RO)	2017	2019	The rescheduling took into account rescheduled (slower than initially announced) increase of the generation park in the area, which was the main driver for the investment
RO	53.276	Suceava(RO)	Gadalin(RO)	2021	2023	The rescheduling took into account rescheduled (slower than initially announced) increase of the generation park in the area, which was the main driver for the investment
RO	53.A131	Stejaru(RO)	Gheorghieni(RO)	2015	2021	changes on generation side

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Country Code	TYNDP Investment Item Code	Substation 1	Substation 2	Commissioning date in TYNDP /REG	Commissioning date in country	Reason for rescheduling
RO	53.A132	Stalpu (RO)		2018	2019	changes due to other transmission investments
RO	53.A132	Teleajen (RO)		2018	2019	changes due to other transmission investments
CZ	56.A93	Tynec (CZ)	Krasikov (CZ)	2025	2023	Changes due to other transmission investments
PL	57.328	Pila Krzewina (PL)	Bydgoszcz Zachód (PL)	2016	2019	Changes on generation side
PL	57.329	Zydowo (PL)	Slupsk (PL)	2015	2019	Changes on generation side
PL	57.330	Zydowo (PL)	Gdansk Przyjazn (PL)	2018	2020	changes on generation side
LT	60.378	Panevezys (LT)	Musa (LT)	2018	2022	changes on generation side
SE	60.A52	Ekhyddan (SE)	Nybro/Hemsjö (SE)	2019	2023	changes due to other transmission investments
LT	61.380	Visaginas (LT)	Kruonis (LT)	2020	2022	changes on generation side
LT	61.382	Vilnius (LT)	Neris (LT)	2020	2022	changes due to other transmission investments
FI	64.A62	Pyhänselkä (FI)	Petäjävesi or Vihtavuori (FI)	2020	2021	changes due to other transmission investments
FI	65.A63	Forssa (FI)	Lieto (FI)	2017	2018	changes due to other transmission investments
NO	68.422	Balsfjord (NO)	Hammerfest (NO)	2018	2021	changes on demand side
NO	68.423	Skaidi (NO)	Varangerbotn (NO)	2022	2025	Changes on demand side
GB	69.424j	Bramford (GB)	Twinstead (GB)	2018/2019		Changes on generation side
DK	72.430	Revsing (DK)	Landerupgård (DK)	2017	2021	changes due to other transmission investments
DK	72.435	Endrup (DK)	Revsing (DK)	2015	2017	Changes on generation side
DK	73.432	Bjaeverskov (DK)	Hovegaard (DK)	2014	2017	Changes on generation side
GB	77.449a	Gravir (GB)	Beauly (GB), subsea	2015	2017	Continuing uncertainty over renewable generation projects on the Isle of Lewis
GB	77.449a	Gravir (GB)	Beauly (GB), underground	2015	2017	Continuing uncertainty over renewable generation projects on the Isle of Lewis
GB	77.450a	Spittal and Kergord (both GB)	Blackhillock (GB)	2016	2018	Continuing uncertainty over renewable generation projects on Shetland Isles; scheme reconfiguration
GB	77.452a	Beauly (GB)	Kintore (GB)	2014	2015	Availability of system outages
GB	77.453a	Blackhillock (GB)	Kincardine (GB)	2016	2018	Need is later because of changes in future generation scenario
GB	77.456	Harker (GB)	Quernmore (GB)	2014/2015	2019	Changes due to correlation with other rescheduled transmission investments
GB	79.459b	Wylfa (GB)	Pembroke (GB)	2020/21	2022	Delays in expected generation connections in this area – Celtic Array and Horizon have both changed their dates.
GB	79.460	Pentir (GB)	Trawsfynydd (GB)	2016/2017	2018	Delays in expected generation connections in this area – Celtic Array and Horizon have both changed their dates.
GB	79.460b	Wylfa (GB)	Pentir (GB)	2017/2018	2022	Delays in expected generation connections in this area – Celtic Array and Horizon have both changed their dates.

Country Code	TYNDP Investment Item Code	Substation 1	Substation 2	Commissioning date in TYNDP /REG	Commissioning date in country	Reason for rescheduling
SE	87.A56	Grönviken (SE)	Horndal (SE)	2020	2021	changes due to other transmission investments
SE	87.A57	Horndal (SE)	Dingtuna (SE)	2020	2021	changes due to other transmission investments
NO	104.420	Storheia (NO)	Snillfjord (NO)	2017-2020	2023-2028	expected date of commissioning of generation
SE	105.A60	Skogssäter (SE)	Stenkullen (SE)	2017	2021	changes due to other transmission investments
PL	319	Skawina (PL)		2015	2018	changes on generation side
PL	359	Recław (PL)	Glinki (PL)	2016	2018	change in the project for the line
PL	343	Byczyna (PL)		2015	2017	changes on generation side
PL	344	Lublin Systemowa (PL)	Abramowice (PL)	2017		Changes on generation side

Figure III - Main reasons for cancellation of investments

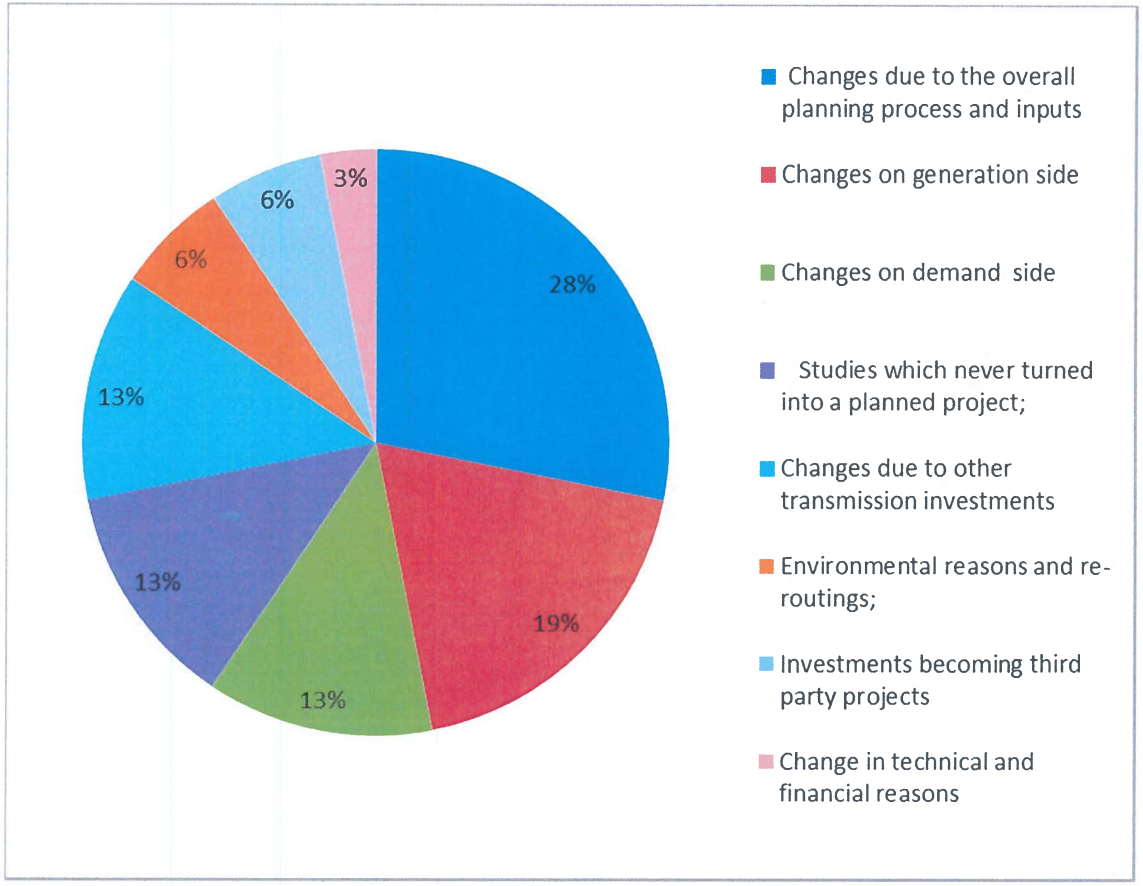

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Table IX Cancelled interconnector investments and related reasons

TYNDP Investment Item Code	Substation 1	Substation 2	Country 1	Country 2	Reasons for cancellation in country 1	Reasons for cancellation in country 2
26.64	Bressanone (IT)	New substation near Innsbruck	IT	AT	A study which never turned into a planned project	(no information on status)
35.137	Vitkov (CZ)	Border with DE (Mechlenreuth)	CZ	DE	Based on an agreement with TenneT the project has been suspended due to transmission capacity and environmental issues on TenneT's side. The strengthening of CEPS-TenneT profile is still foreseen but there is no concrete planning for the time being. A substitute intertie project will be developed as soon as the abovementioned problems are solved	(no information on status)
38.425	Feda (NO)	Eemshaven (NL)	NO	NL	change due to other transmission investments	Currently no plans to further increase the interconnector capacity out of Norway, nor plans for domestic reinforcements to facilitate more interconnector capacity
67.402	Barkeryd (SE)	Tveiten (NO)	SE	NO	New interconnections from and reinforcements internally in Norway, has led to reduced need and benefit from an electricity market perspective for a new interconnection between Norway and Sweden.	The project is cancelled by the TSOs in Norway and Sweeden because analyses show that the benefit does not exceed the costs.
69	Candia (IT)	Konjsko (HR)	IT	HR	the TPP project is not included because TPPs are normally not included in the national plan	(no information on status)
71	Brindisi (IT)	Babica (AL)	IT	AL	the TPP project is not included because TPPs are normally not included in the national plan	Out of scope of analysis
72	Aetos (GR)	Galatina (IT)	GR	IT	The increase of generation capacity in Italy, due to which imports from Greece are no longer necessary	The study never turned into a planned project
397	Varangerbotn(NO)	Pirttikoski or Petäjäskoski (FI)	NO	FI	Cancelled due to changes on demand and generation side	There has not been a real project here to begin with, just some preliminary feasibility studies

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Table X: Cancelled internal investments and related reasons

Country Code	TYNDP Investment Item Code	Substation 1	Substation 2	Reasons for cancellation
DE	44.171	Hüffenhardt (DE)	Neurott (DE)	This project is no longer required due to changes in the grid planning process.
SK	48.A125	Velký Dur (SK)	Levice (SK)	The decision to cancel this investment has been confirmed by the internal network analysis. The added value of this line has been shown as low as the desired network reinforcement in this area will be sufficiently obtained by the project Nr. 48.298.
GR	49.252	Melliti (GR)	Kardia (GR)	changes on demand side
GR	49.253	Kardia (GR)	Trikala (GR)	changes on demand side
GR	49.254	Larissa(GR)	Trikala (GR)	changes on demand side
CZ	55.310	Vyskov (CZ)	Reporyje (CZ)	The project is cancelled and replaced by other new two to make a use of existing corridors projects. Project has a status under consideration in TYNDP 2012. Due to the results of feasibility study (crossing protected area) the project was cancelled
PL	57.320	Dargoleza (PL)		Project cancelled. TSO has changed the concept of network development in the field of wind power plants.
DK	72.436	Idomlund (DK)	Endrup (DK)	Replaced by upgrade of existing route to Idomlund to be proposed for TYNDP 2012
GB	77.454	Hawthorn Pit (GB)	Norton (GB)	Since the submission of the project to the TYNDP last year, a decision has been made that the project is not required at this time so it has been excluded from the ETYS.
NO	104.A51	Svartisen (NO)	Nedre Røssåga (NO)	The study never turned into a planned project
GR	255	Lamia (GR)		changes on demand side
HU	282	Sajoszoged / God (HU)	Detk (HU)	Due to changes in planning input data (there is no investment need).
HU	288	Albertirsa / Martonvasar (HU)	Szazhalombatta (HU)	Generation connection request was cancelled.
HU	292	Debrecen (HU)		Due to changes in need and also financial reasons. (Necessity of 750kV level has been reconsidered and deemed unnecessary)
PL	323	Warszawa Siekierki (PL)	Piaseczno (PL)	Project canceled due to promoter's withdrawal from construction of the power plant.
PL	359	Morzyczyn (PL)	Pomorzany/ Glinki (PL)	The alternative line Pomorzany-Krajnik replaced the investment.
PL	360	Miłosna (PL)	Siekierki (PL)	Project canceled due to promoter's withdrawal from construction of the power plant.
PL	362	Wielopole (PL)	Moszczenica (PL)	Project canceled. Promoters withdrew construction of the power plant
DK	429	Ferslev (DK)	Vester Hassing (DK)	The project has been cancelled due to changes in the long-term national grid planning, changing needs, development of other lines instead etc.
DK	431	Tjele (DK)	Trige (DK)	The project has been cancelled due to changes in long-term national grid planning, i.e. changing needs, development of other lines instead etc.

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Table XI: OTHER investment components

Country Code	ACER Investment Item Code	Substation 1	Substation 2	Component / Investment item description	Status
MT	0009001	Malta	Border with Italy	A new submarine AC cable from Sicily island to Malta at 220 kV level with a length of 120 km	Under construction
IT	0009001	Ragusa area, Sicily (IT)	Border with Malta	The project will allow the connection of the Maltese electricity distribution system to the European transmission grid in Sicily. The project is at present under construction and consist of two HVDC link between Malta Island and Sicily Island (Ragusa substation).	Under construction
HR	0009002	Tumbri (HR)	Veleševac (HR)	New 31,7 km double circuit 400 kV OHL	Planned
HR	0009003	Nova Sela (HR)	Plat (HR)	New 145 km double circuit 220 kV OHL	Planned
HR	0009004	KKE Osijek (HR)	Ernestinovo (HR)	New 10 km double circuit 400 kV OHL	Planned
HR	0009005	KKE Slavonski Brod (HR)	Razbojište (HR)	New 60 km double circuit 400 kV OHL	Planned
HR	0009006	Lika (HR)	Melina (HR)	New 68 km single circuit 400 kV OHL	Planned
HR	0009007	RHE Korita (HR)	Konjsko (HR)	New 26,1 km double circuit 400 kV OHL	Planned
BG	0009008	Vetren (BG)	Blagoevgrad (BG)	The Cluster BG North-South Grid Enhancement consists construction of two new high-voltage transmission lines, as follows 1)OHL 400kV s/s "Vetren" – s/s "Blagoevgrad", 100 km. 2)OHL 400kV s/s "Tsarevets" – s/s "Plovdiv", 150 km. The construction of both lines will significantly increase interoperability and secure operation of Bulgarian 400kV network under normal and repair conditions.	(blank)
BG	0009009	Tsarevets (BG)	Plovdiv (BG)	The Cluster BG North-South Grid Enhancement consists construction of two new high-voltage transmission lines, as follows 1)OHL 400kV s/s "Vetren" – s/s "Blagoevgrad", 100 km. 2)OHL 400kV s/s "Tsarevets" – s/s "Plovdiv", 150 km. The construction of both lines will significantly increase interoperability and secure operation of Bulgarian 400kV network under normal and repair conditions.	(blank)
ES	0009010	Gatica (ES)	Border with UK (Indian Queens)	Submarine HVDC link between a strong node in the north coast of Spain and the southwestern coast of Great Britain	(blank)
GB	0009010	Border with ES (Gatica)	Indian Queens (GB)	Submarine HVDC link between a strong node in the north coast of Spain and the southwestern coast of Great Britain	under consideration
LT	0009011	LT	Border with PL	Estonia / Latvia / Lithuania synchronous interconnection with the Continental European networks	Design & permitting
PL	0009011	Border with LT	PL	Estonia / Latvia / Lithuania synchronous interconnection with the Continental European networks	(blank)
DE	0009012	DE	Border with FR	DE-FR interconnection project included in the French national plan	(blank)

Country Code	ACER Investment Item Code	Substation 1	Substation 2	Component / Investment item description	Status
FR	0009012	Border with DE	FR	DE-FR interconnection project included in the French national plan	under consideration
FR	0009013	Cotentin (FR)	Border with GB (vicinity of Exeter)	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).	under consideration
GB	0009013	Vicinity of Exeter	Border with FR (Cotentin)	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).	(blank)

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