European Network of
Transmission System Operators
for Electricity

entsoe

2015 Monitoring update of the TYNDP 2014 Table of projects

24 June 2015

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2 Executive Summary

ENTSO-E, in line with comments received from the Agency for Cooperation of European Regulators (ACER), the European Commission, and various other stakeholders, has a goal to improve transparency of the evolution of investments included in the Ten Year Network Development Plan (TYNDP). To meet that goal, ENTSO-E publishes a monitoring update of the portfolio of pan-European significance investments included in the TYNDP one year after its publication. This report presents an overview of the evolution of the TYNDP 2014 investments, including statistics, as well as an updated table of projects focused on the project's status, date of commissioning and additional monitoring information.

The validated data shows a majority of investments, 66%, are on-time regarding commissioning date, 15% are delayed, 15% have been rescheduled, 3% have been cancelled and 1% are ahead of time. This report focuses somewhat on the causes of investment and project delays, due to both their frequency and the adverse impact they have on the ongoing development on the Pan-European network. Major reasons for delays are due to difficulties in gaining permits and seeking public consent necessary for building new infrastructures.

Long term investments that are at the early stage of the planning process have been separated in the statistics regarding modification of commissioning dates as part of the category "*rescheduled*". Investments postponed due their external driver being delayed (e.g. connection of new RES postponed…) also fall into this category. Rescheduling of projects does not necessarily imply a negative impact on progress in network development, rather an adaptation to changing circumstances. Likewise, cancellation of projects may well be due to the re-clustering or repurposing of investments, thus they are replaced or negated by new investments and do not represent the degradation or slowing of grid evolution.

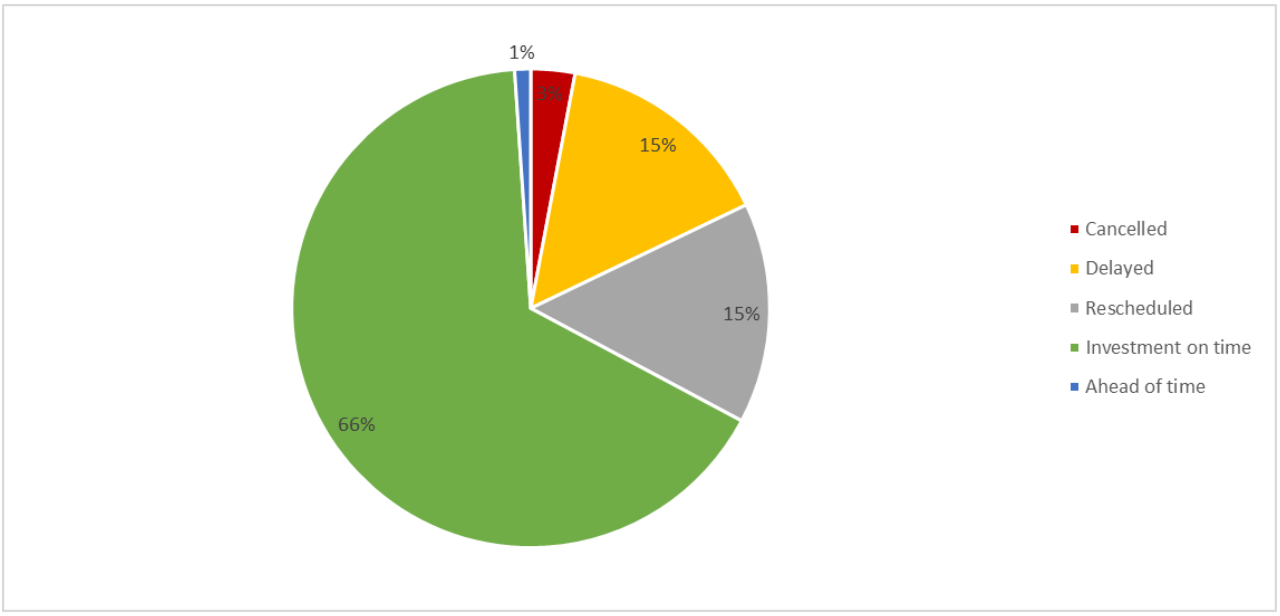

FIGURE 1 MONITORING OF TYNDP 2014 REPORT

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3 Introduction

The European Network of Transmission System Operators for Electricity (ENTSO-E), hereby provides a 2015 update for the Table of Projects contained within the 2014 publication of the community-wide Ten Year Network Development Plan (TYNDP)[1].

The objectives of the TYNDP are to ensure transparency regarding the European electricity transmission networks and to facilitate decision making processes at both regional and European levels. The TYNDP suite of documents consists of a pan-European report and six Regional Investment Plans as well as a "System Outlook and Adequacy Forecast" which aim to give a comprehensive and up-to-date European-wide reference to the anticipated development of transmission networks. Such development is a key step in achieving the European energy policy goals.

The publication of TYNDP 2014 complied with the requirements in Regulation (EU)714/2009, whereby "ENTSO-E shall adopt a non-binding Community-wide 10 year network development plan, including a European adequacy outlook, every two years". The pan-European report contained a comprehensive list of all electricity transmission projects of pan-European significance. The TYNDP 2014 package was publically consulted upon in spring 2014 to allow final publication in June 2014.

4 Rationale behind the publication of an intermediate report between TYNDPs

After the publication of the TYNDP 2012 the Agency for Cooperation of European Regulators (ACER) published a letter outlining their opinion on the output, including recommendations for future TYNDP publications. The Agency suggested that there should be improved monitoring of investments. In particular full transparency of the evolution of investments, especially those delayed or cancelled and the reason for such changes should be stated.

Within their response ENTSO-E agreed that the monitoring of the evolution of pan-European projects is important so implementation bottlenecks can be identified. Consequently, ENTSO-E committed to publish a mid-cycle update to the TYNDP 2012 table of projects, which took the form of the 2013 Monitoring Update[2]. ENTSO-E also committed to providing more detailed information on the investments' status in the TYNDP 2014, and intends to repeat both stages of reporting in this TYNDP cycle.

This Monitoring Update provides transparency and detailed information so as to allow the effective tracking of the investments included in the TYNDP 2014. Without such an interim update an investment status and schedule could significantly change within the two year time period between TYNDP publications, without being visible to the interested stakeholders and decision bodies.

[1] https://www.entsoe.eu/major-projects/ten-year-network-development-plan/tyndp-2014/
[2] https://www.entsoe.eu/news-events/announcements/announcements-archive/Pages/News/monitoring-update-infrastructure-projects-of-european-relevance-tyndp-2012.aspx

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5 Methodology and Definitions

This monitoring report is an update of, and complementary to, the TYNDP 2014 and therefore the two reports should be read in conjunction with each other. An update is made of all the investments contained within the Community wide TYNDP 2014. New, additional investments will not be included until TYNDP 2016 as ENTSO-E is currently in the study process.
In order to focus on the key elements of data required for investment monitoring, the information on each investment is limited to existing projects. The investments already commissioned or cancelled in TYNDP 2014 are not taken into account in this update. For the investments presented, only the following properties are listed:

- **TYNDP 2014 Investment Number** – A numerical reference number consistent with the TYNDP 2014

- **Brief technical description** – A text summary of the investment, including technical parameters

- **Present status** – Each investment is given one of the following statuses to highlight its maturity:
  - Under Consideration
  - Planning
  - Design and Permitting
  - Under construction
  - Commissioned
  - Cancelled

- **Up-to-date expected date of commissioning** - In order to increase transparency, ENTSO-E strived to publish the best estimate expected commissioning date for all investments. However, for long term investments at a very preliminary stage, no accurate expected commissioning date is available as it will be assessed later as part of the feasibility studies, therefore 2030 is conventionally displayed.

- **Evolution since TYNDP 2014 –** The investments presented may have changed in the following ways:
  - Investment on time
  - Ahead of time
  - Delayed
  - Rescheduled
  - Cancelled

- **Evolution Driver** – A short explanation or comment, especially for investments being delayed, rescheduled or having been cancelled since TYNDP 2014.

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6 Quantitative & Qualitative analysis of evolution since TYNDP 2014

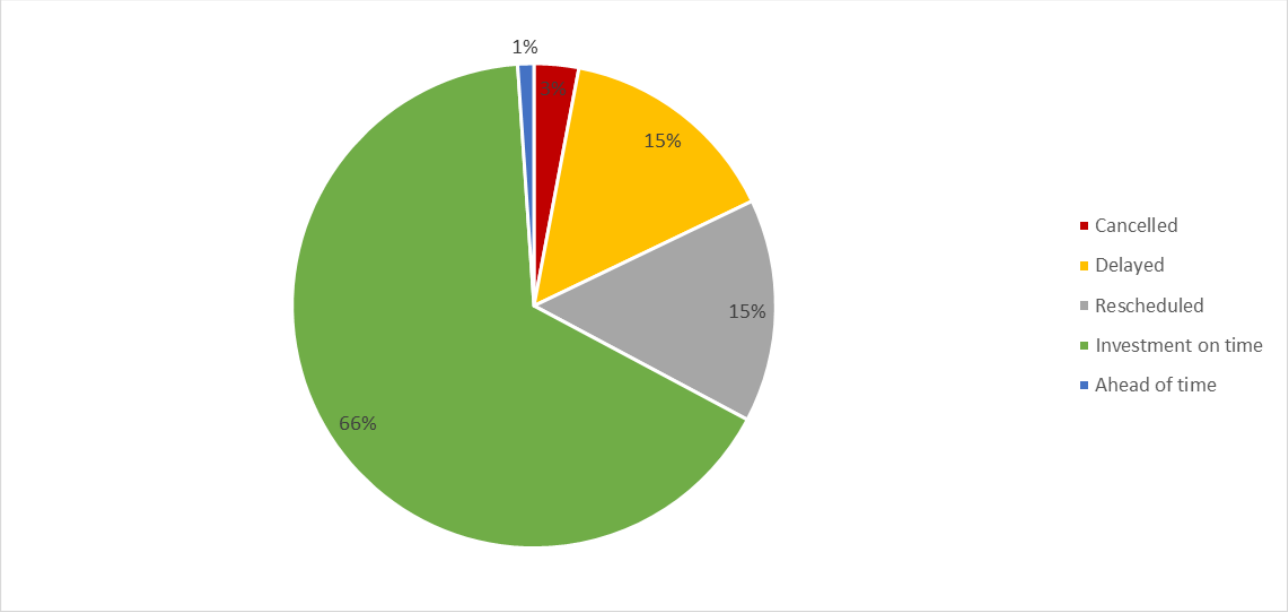

FIGURE 2 MONITORING OF TYNDP 2014 REPORT

Figure 2 above presents the status of the investments of pan-European significance contained in the Community wide TYNDP 2014 Table of Projects. As shown in this diagram, the majority of investments are currently on schedule for their stated delivery. Of those not on or ahead of time, 3% are cancelled, around 15% of investments have experienced a delay to deliver over the last year, and 14% have been rescheduled. The main drivers of these investments deviating from the timeline presented in TYNDP 2014 are covered in the following 3 sections.

The updated TYNDP Table of Projects is shown in Annex 1 of this document.

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6.1 Cancelled investments

3% of the investments have been cancelled. The main driver category selected are changes on the demand and generation sides, negating the need for the project. The large category 'Other reasons' covers circumstances such as failure to meet new clustering rules, omission from National Development Plans, and being merged into different projects- none of these reasons represent a substantial portion of investments in themselves.

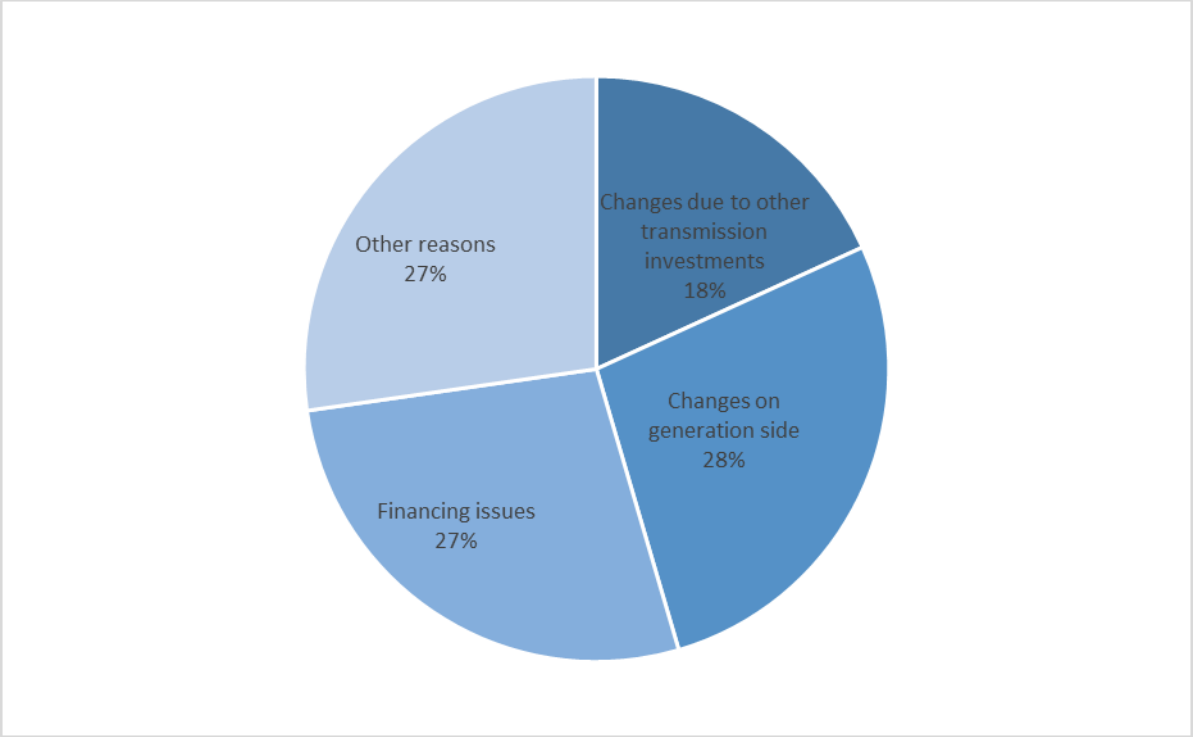

FIGURE 3 CANCELLED INVESTMENTS

6.2 Delayed investments

As found in the Monitoring Update for TYNDP 2012, the majority of investments were delayed as a result of difficulties in gaining permits and seeking public consent. Reasons captured with the category 'Other reasons' include a number of problems caused by public opposition, and the necessity of additional studies to prepare an optimal technical design which takes longer than expected. The other significant contributors are delays related to acquisition of land, and due to other investments.

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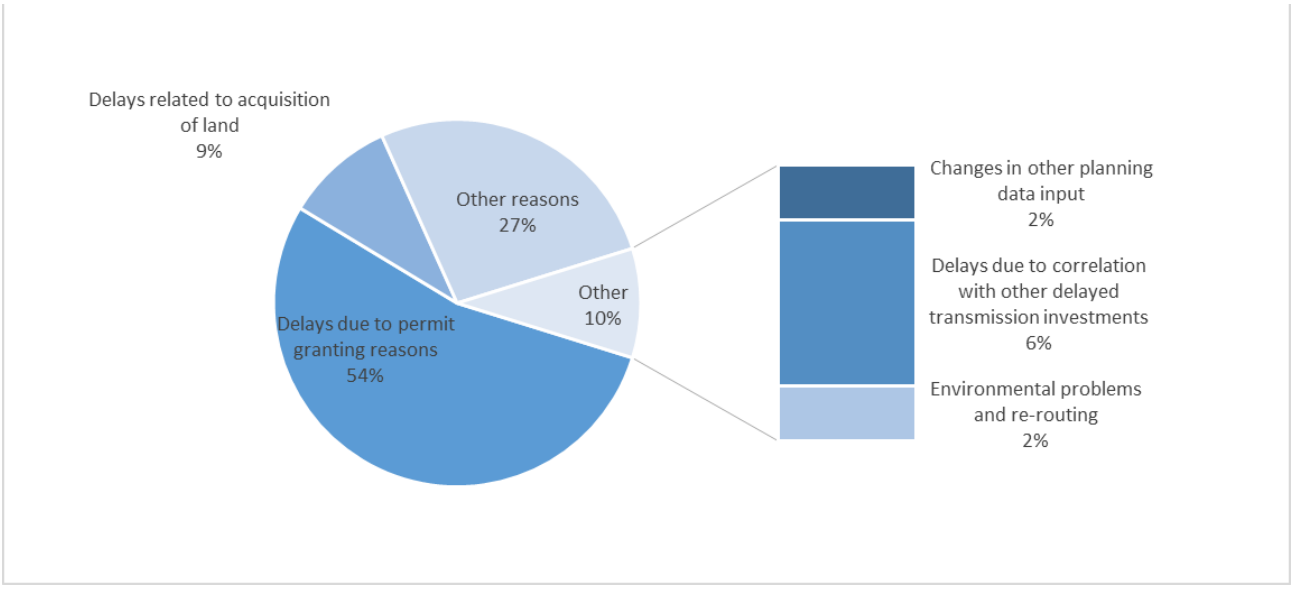

FIGURE 4 DELAYED INVESTMENT

6.3 Rescheduled Investments

The category 'rescheduled' is used in this monitoring update to highlight the uncertainty of long terms investment. In particular, investments which meet all the criteria below are displayed as rescheduled:

- To be commissioned after 2020 in the current report
- Still under consideration or planning
- Postponed

The objective is to give a comprehensive picture of the investment's evolution in relation to their maturity. Indeed, the status "rescheduled" corresponds to long term, or conceptual investments, at the early stage of the planning process, on which further studies have allowed the provision of more accurate date of commissioning, based for instance on a better understanding of the technical challenges or of the socio-economic environment. In addition, investments postponed due to their external driver being delayed (e.g. connection of new RES postponed…) are also reported into this category.

Most of these investments see a delay to the date of commissioning dates by longer than 3 years and are mostly related to important changes in the generation connection expectations.

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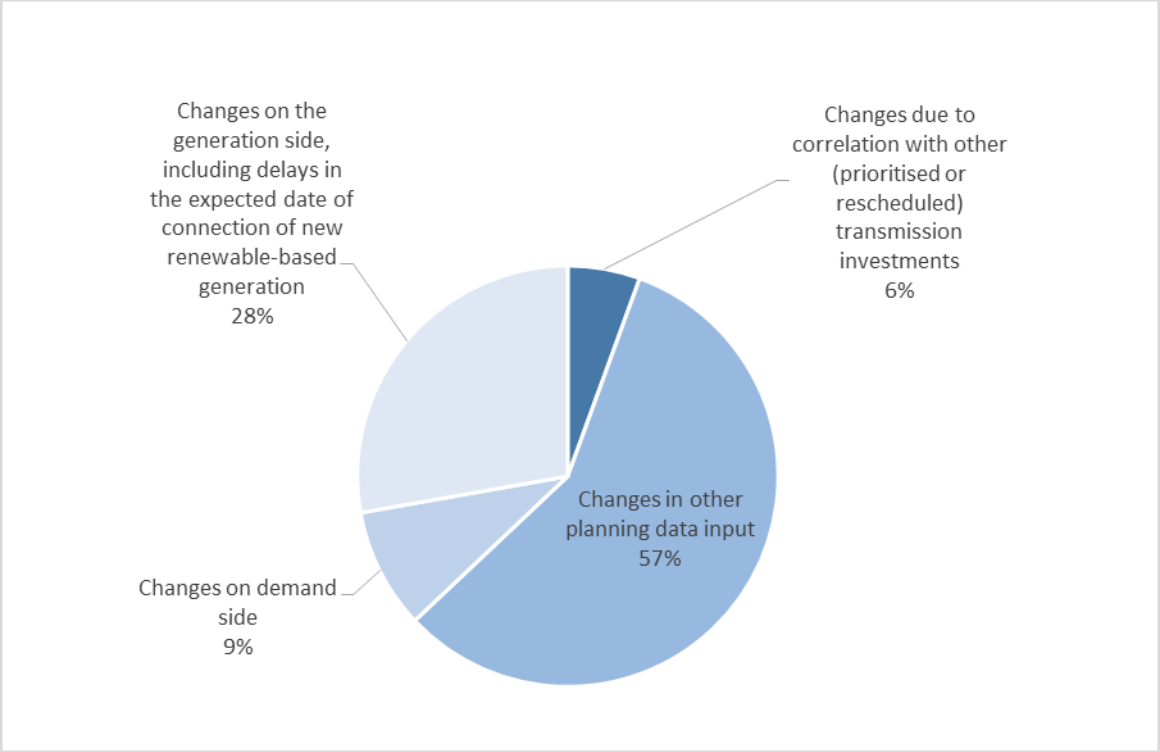

FIGURE 5 RESCHEDULED INVESTMENTS

As was found in TYNDP 2012's monitoring update, a majority of rescheduling is necessitated by changes to planning data- this is most frequently a manifestation of commissioning dates becoming clearer as project and investment plans develop. The other 2 major contributing categories are changes due to generation and demand side factors- commonly a change in date of the connection of relevant generation and demand.

Introducing TYNDP 2016

Work is ongoing in the production of the TYNDP 2016; this reports publication coincides with the closing of the Common Planning Studies phase, and the publication of the 6 Regional Investment Plans. In September the assessment phase will begin, wherein projects of pan-European significance are assessed against the updated Cost Benefit Analysis process, facilitating the production and publication of the full report by summer 2016.

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TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
1	V.Minho (PT)	Pedralva (PT)	Connection of the new 400kV substation V.Minho to Pedralva substation by means of two new 400kV lines(2x43)km. The realization of this two connections can take advantage of some already existing 150kV single lines, which will be reconstructed as double circuit lines 400+150kV line and partially sharing towers with those 400kV circuits.	2015	Under Construction	Investment on time	The first circuit was commissioned in 2014, the second is under construction. Progressed as planned.
3	Pedralva (PT)	V. Castelo (PT)	New 57,5km double circuit Pedralva - V. Castelo 400kV OHL (one circuit installed).	2015	Under Construction	Investment on time	In the first stage the line will be connected between Pedralva and Vila Nova de Famalicão (previously Vila do Conde). New substation of Ponte de Lima (previously Viana do Castelo) will be commissioned in 2018
9	Fundão (PT)	Falagueira (PT)	New 400kV double circuit OHL Fundão (PT) -'Castelo Branco zone'-Falagueira (PT)	2017	Design & Permitting	Investment on time	Project on time
484	Fundão (PT)		New 400/220kV substations in Fundão.	2017	Design & Permitting	Investment on time	Project on time
497	Vila do Conde (PT)	Recarei/Vermoim (PT)	New double circuit 400kV OHL between Vila do Conde (PT) - Recarei/Vermoim (PT).	2015	Under Construction	Investment on time	Progressed as planned
501	Vila do Conde (PT)		New 400kV substation Vila do Conde (PT).	2015	Under Construction	Investment on time	Substation renamed to Vila Nova de Famalicão. Progressed as planned.
2	Pedralva (PT)	Sobrado (PT)	New 47km double circuit Pedralva (PT) - Sobrado (PT) 400kV OHL, (only one circuit installed in a first step).	2022	Planning	Rescheduled	Due to the expected delay of the connection of new RES generation in North of Portugal, the commissioning date of this investment item was rescheduled
4	V.Minho (by Ribeira de Pena and Fridão)	Feira (by Ribeira de Pena and Fridão)	New 129km double-circuit 400kV OHL V.Minho (PT) - Ribeira de Pena (PT) - Fridão (PT) - Feira (PT) (one circuit operated at 220kV between V.P. Aguiar and Estarreja) with a new 400/60kV substation in Rib. Pena. In a first step, only the 139km section Rib. de Pena (PT) - Feira (PT) will be constructed and operated at 220kV as Vila Pouca Aguiar (PT) - Carrapatelo (PT) - Estarreja (PT). In a second step, one circuit of this line will be operated at 400kV.	2021	Design & Permitting	Rescheduled	Due to the expected delay of the connection of new hydro power plants, the commissioning date of this investment item was rescheduled.

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
474	Ribeira de Pena (PT)		New 400/60kV substation in Rib. Pena.	2020	Design & Permitting	Rescheduled	Due to the expected delay of the connection of new hydro power plants, the commissioning date of this investment item was rescheduled.
476	V. P. Aguiar (by Carrapatelo)	Estarreja (by Carrapatelo)	New 400+220kV double circuit OHL (initially only used at 220kV) Vila Pouca Aguiar - (Rib. Pena) - Carrapatelo - Estarreja . Total length of line: 2x(96+49)km. 220kV circuit.	2020	Design & Permitting	Rescheduled	Due to the expected delay of the connection of new RES generation in Portugal, the commissioning date of this investment item was rescheduled
8	Seia	Penela	New single circuit 400kV OHL Seia-Penela (90km).	2020	Design & Permitting	Rescheduled	Due to the expected delay of the connection of new hydro power plant, the commissioning date of this investment item was rescheduled
478	Penela (PT)	Paraimo / Batalha (PT)	New double circuit 400kV OHL (15km) to connect Penela substation to Paraimo-Batalha line.	2019	Design & Permitting	Rescheduled	Due to the expected delay of the connection of new hydro power plant, the commissioning date of this investment item was rescheduled
481	Penela (PT)		Expansion of the existing Penela substation to include 400kV facilities.	2019	Design & Permitting	Rescheduled	Due to the expected delay of the connection of new hydro power plant, the commissioning date of this investment item was rescheduled
18	Beariz (ES)	Fontefria (ES)	New northern interconnection. New double circuit 400kV OHL between Beariz (ES) - Fontefria (ES).	2017	Design & Permitting	Delayed	The delay of this investment is affected by the explanation in the investment 496. Also, environmental problems lead to re-routing.
500	V. Castelo (PT)		New 400/150kV substation V.Castelo (PT).	2018	Design & Permitting	Delayed	Substation renamed to Ponte de Lima. See Investment 496.

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
496	Fontefría (ES)	Vila do Conde (PT) (By Viana do Castelo)	New northern interconnection. New 400kV OHL Fontefría (ES) - Viana do Castelo (PT) - Vila do Conde (PT).	2018	Design & Permitting	Delayed	Due to local opposition in the border area REN had to withdraw the Portuguese section of the interconnection of the ongoing EIA process to maintain the schedule of other investments included in the EIA needed for connecting new hydro in Cávado
498	Fontefria (ES)		New northern interconnection. New 400kV substation Fontefria (ES), previously O Covelo.	2017	Design & Permitting	Delayed	The delay of this investment is affected by the explanation in the investment 496. Also, environmental problems lead to re-routing
499	Beariz (ES)		New northern interconnection. New 400kV substation Beariz (ES), previously Boboras	2017	Design & Permitting	Delayed	The delay of this investment is affected by the explanation in the investment 496. Also, environmental problems lead to re-routing
503	JM Oriol (ES)	Arenales - Caceres (ES)	New 220kV JM Oriol-New Oriol -Arenales-Caceres. It requires new subestation Oriol	2018	Design & Permitting	Delayed	Delays due to change of the definition of the project and national law RDL 13/2012 has frozen the permitting process until publication of the next NDP
504	Arenales (ES)		New Arenales substation.	2018	Design & Permitting	Delayed	National law RDL 13/2012 has frozen the permitting process until publication of the next NDP
36	Sta.Llogaia (ES)	Baixas (FR)	New HVDC (VSC) bipolar interconnection in the Eastern part of the border, via 320kV DC underground cable using existing infrastructures corridors and converters in both ending points.	2015	Commissioned	Investment on time	Construction finalized in December 2014. Commissioned for commercial operation in June 2015
506	Baixas (FR)		Converter station of the new HVDC (VSC) bipolar interconnection in the Eastern part of the border, via 320kV DC underground cable using existing infrastructures corridors.	2015	Commissioned	Investment on time	Works completed in 2014; commercial operation after test period in Summer 2015.
505	Sta.Llogaia (ES)		Converter station of the new HVDC (VSC) bipolar interconnection in the Eastern part of the border, via 320kV DC underground cable using existing infrastructures corridors.	2015	Commissioned	Investment on time	Construction finalized in December 2014. Commissioned for commercial operation in June 2015

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
31	Caparacena (ES)	La Ribina (ES)	New double circuit Caparacena-Baza-La Ribina 400kV OHL.	2025	Under Consideration	Investment on time	Investment rescheduled due to, and in accordance with, delayed development of new power plant, as considered in the Master Plan 2020 in progress
569	Baza (ES)		New 400kV substation in Baza	2025	Under Consideration	Investment on time	Progressed as planned
570	La Ribina (ES)		New 400kV substation in La Ribina (will be connected as an input/output in Carril-Litoral 400kV line).	2025	Under Consideration	Investment on time	Progressed as planned
38	Gatica (ES)	Aquitaine (FR)	New HVDC interconnection in the western part of the border via DC subsea cable in the Biscay Gulf.	2022	Planning	Rescheduled	The investment progressed as previously planned. Intergovernmental agreements ask for speed up implementation of this project
55	Grande Ile (FR)	Piossasco (IT)	"Savoie - Piémont" Project : New 190km HVDC (VSC) interconnection FR-IT via underground cable and converter stations at both ends (two poles, each of them with 600MW capacity). The cables will be laid in the security gallery of the Frejus motorway tunnel and also along the existing motorways' right-of-way.	2019	Under Construction	Investment on time	Works in progress.
57	Genissiat (FR)	Verbois (CH)	Upgrading of the existing 225kV double circuit line Genissiat-Verbois to increase its capacity.	2020	Planning	Investment on time	Progressed as planned
60	Avelin/Mastaing (FR)	Horta (new 400-kV substation) (BE)	Replacement of the current conductors on the axis Avelin/Mastaing - Avelgem - Horta with high performance conductors (HTLS = High Temperature Low Sag)	2022	Design & Permitting	Rescheduled	Planning has been actualized in accordance to achieved progress, with the evaluation of the final investment decision currently planned in 2018

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
606	Gramme (BE)	Van Eyck (BE)	Gramme-Van Eyck Part 1: second 380kV circuit. First phase of reinforcement on the axis Gramme-Van Eyck, needed to facilitate connection of possible new central generation and to prepare for increasing transit fluxes whilst securing market capacity between BE & NL. This investment consist of creating a second 380kV line on the axis Gramme-Van Eyck - Section Van Eyck - Zutendaal (30 km): need to erect a new single circuit. Done with high performance conductors in order to be future proof (cfr. phase 2) - Section Grammme - Zutendaal (55km): reconfiguration of 150kV network so that an existing 150kV line can be operated at 380kV	2015	Under Construction	Investment on time	Progressed as planned.
607	Van Eyck (BE)		Gramme-Van Eyck Part 1: substation Van Eyck 380. First phase of reinforcement on the axis Gramme-Van Eyck, needed to facilitate connection of possible new central generation and to prepare for increasing transit fluxes whilst securing market capacity between BE & NL. This investment item consists of construction a 380kV substation named "Van Eyck", needed to integrate the second 380 kV line on the axis Gramme-Van Eyck.	2015	Under Construction	Investment on time	Progressed as planned.

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
608	Horta (BE)	Mercator (BE) / (Doel)(BE)	Horta-Mercatorin HTLS. Critical element in the Belgian backbone, which needs to be upgraded in order to transport higher north-south fluxes (transit flows + additional market flows) and to allow connection of possible new generation (+-1000 MW) on the axis. Upgrade consists of replacing the current double circuit 380kV by high performance conductors allowing to double its transport capacity. The line currently passing Mercator going to Doel will be integrated into Mercator substation to obtain a better flux balance and avoid an upgrade between Mercator & Doel at this stage.	2019	Design & Permitting	Ahead of time	The expected commissioning date of 2019 is based on the hypothesis of acquiring all necessary permits as planned, followed by the assessment of the final investment decision towards 2017.
445	Zandvliet (BE)	Lillo (BE)	BRABO II: Zandvliet-Lillo-Liefkenshoek + restructuring 150kV BRABO II + III allow to realize the intended market capacity increase on the North Border after BRABO I in a more robuste way, to secure increased demand around Antwerp Harbour area (mainly BRABO II) and to create capacity for connection of possible new generation (mainly BRABO III) This by constructing a new 380kV connection Zandvliet-Lillo-Mercator, in addition to the existing Zandvliet - Mercator connection. This investment item concerns the part from Zandvliet via Lillo to Liefkenshoek where the new line will be the temporarily connected onto the existing Doel-Mercator line. It also involves also a restructuring of the adjacent 150kV network.	2020	Design & Permitting	Delayed	Progress made in permitting procedures brought clarification to preferential trajectory. Planning has been reviewed accordingly with 2019 based upon the hypothesis of acquiring all necessary permits as currently planned.

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
609	Zandvliet (BE)		New PST in Zandvliet substation making it the 4 th PST on the Belgian North Border, allowing a more symmetrical utilisation of the PST's. Enabling this PST to increase import capacity from NL to BE implies that the current 150kV line Zandvliet-Doel is converted to 380kV, involving adaptations to be made to the configurations of Zandvliet & Doel substations and a solution to cover the supply of Doel 150kV (probably transfo 380/150). Integrating this PST at Zandvliet also implies that a "langskoppeling" is put at Zandvliet as temporary interface between Zandvliet and the NL network until the post "Rilland" is constructed in NL (investment item 439 as part of project # 103 "Reinforcements Ring NL"). Note that the realization of investment item 439 is needed as well to allow a capacity increase direction BE to NL.	2016	Under Construction	Investment on time	Progressed as planned.
605	Lillo (BE)		This investment item concerns the construction of the 380kV substation Lillo as part of the BRABO II project.	2020	Design & Permitting	Delayed	Progress made in permitting procedures brought clarification to preferential trajectory. Planning has been reviewed accordingly with 2019 based upon the hypothesis of acquiring all necessary permits as currently planned.
604	Lillo (BE)	Mercator (BE)	BRABO II + III allow to realize the intended market capacity increase on the North Border after BRABO I in a more robuste way, to secure increased demand around Antwerp Harbour area (mainly BRABO II) and to create capacity for connection of possible new generation (mainly BRABO III). This by constructing a new 380kV connection Zandvliet-Lillo(new substation)-Mercator, in addition to the existing Zandvliet - Mercator connection. This investment item concerns the part from Liefkenshoek to Mercator, where an existing 150kV link will be replaced by the new 380 kV link.	2023	Design & Permitting	Rescheduled	With the hypothesis of the nuclear phase out taking place as per the current legal framework in combination with the cancellation of plans to construct new production units in the area, the third phase of BRABO has been rescheduled.
62	Tourbe (FR)	Chilling (GB)	New subsea HVDC VSC link between the UK and France with a capacity around 1000 MW. PCI 1.7.2 (NSCOG corridor)	2020	Design & Permitting	Investment on time	On the French side, the Ministry of Energy acknowledged the notification of the investment on 08/04/14.
63	Lienz (AT)	Veneto region (IT)	The project foresees the reconstruction of the existing 220kV-interconnection line as 380kV-line on an optimized route to minimize the environmental impact. Total length should be in the range of approx. 140km.	2023	Planning	Investment on time	Planning in progress coordinated between TERNA and APG

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
218	Obersielach (AT)	Lienz (AT)	New 380kV OHL connecting the substations Lienz (AT) and Obersielach (AT) to close the Austrian 380kV-Security Ring in the southern grid area. Line length: 190km.	2023	Planning	Investment on time	Progressed as planned. As the project is part of the national development plan, the status is set to "planning".
614	Nauders (AT)	Glorenza (IT)	interconnector IT-AT (phase 1)	2018	Design & Permitting	Investment on time	Progressed as planned
70	Villanova (IT)	Lastva (ME)	New 1000MW HVDC interconnection line between Italy and Montenegro via 393km 500kV DC subsea cable and converter stations at both ending points.	2017	Under Construction	Investment on time	Progressed as planned
621	Villanova (IT)		Converter station of the new 1000MW HVDC interconnection line between Italy and Montenegro via 393km 500kV DC subsea cable.	2017	Under Construction	Investment on time	Progressed as planned
624	Lastva (ME)		New 400 kV substation Lastva in Montenegro will be connected to the existing line 400kV Podgorica 2(ME)-Trebinje(BA), with two transformers 2X300MVA 400/110kV. This substation will enable secure supply of the Montenegrin coastal network, and connection of the convertor station for the HVDC cable between Montenegro and Italy.	2016	Under Construction	Delayed	The commissioning date has been updated to be coherent with the new schedule of the activities also considering that the construction phase of the substation started in mid-2014
622	Lastva (ME)		Converter station in Montenegro of the new 1000MW HVDC sub-sea 500 kV cable between Italy and Montenegro.	2017	Under Construction	Investment on time	Progressed as planned
635	Sicily Area (IT)	North Africa node	New interconnection between Italy and North Africa-new DC submarine cable	2030	Under Consideration	Investment on time	Progressed as planned
75	Sorgente (IT)	Rizziconi (IT)	New 90km double circuit 400kV line, partly via subsea cable and partly via OHL. This line is part of a larger project that foresees the creation of the future 400kV grid of Sicily.	2015	Under Construction	Investment on time	Progressed as planned

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
124	Mettlen (CH)	Airolo (CH)	Upgrade of existing 225kV OHL into 400kV. Line length: 90km.		Cancelled	Cancelled	not part of the national grid development plan TYNDP 2016 Project 'Swiss Ellipse I' now ensures the role of former investment 124
642	Airolo (CH)	Pallanzeno(IT)-Baggio(IT)	New interconnection project beetween Italy and Switzerland;	2022	Design & Permitting	Investment on time	Progressed as planned
90	Calenzano (IT)	Colunga (IT)	Voltage upgrade of the existing 80km Calenzano-Colunga 220kV OHL to 400kV, providing in and out connection to the existing 220/150kV substation of S. Benedetto del Querceto (which already complies with 400kV standards).	2019	Design & Permitting	Delayed	delay in the permitting process (EIA)
68	Okroglo (SI)	Udine Sud (IT)	New 120km double circuit 400kV OHL between Okroglo(SI) and future substation of Udine Sud (IT) with PST in Okroglo.	2030	Under Consideration	Rescheduled	The project is under consideration following to the changing scenario conditions.
92	West Udine (IT)	Redipuglia (IT)	New 40km double circuit 400kV OHL between the existing substations of West Udine and Redipuglia, providing in and out connection to the future 400kV substation of South Udine.	2016	Under Construction	Investment on time	Progressed as planned
313	Kocin (CZ)	Mirovka (CZ)	Connection of 2 existing 400kV substations with double circuit OHL having 120.5km length: and a capacity of 2X1700 MVA.	2024	Design & Permitting	Investment on time	Investment evolution as indicated in previous TYNDP

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
315	Kocin (CZ)	Prestice (CZ)	Adding second circuit to existing single circuit line OHL upgrade in length of 115.8km. Target capacity 2x1700 MVA.	2028	Design & Permitting	Investment on time	Investment evolution as indicated in previous TYNDP.
311	Kocin (CZ)		Upgrade of the existing substation 400/110kV; upgrade transformers 2x350MVA.	2024	Design & Permitting	Investment on time	Investment evolution as indicated in previous TYNDP.
316	Mirovka (CZ)	Cebin (CZ)	Adding second circuit to existing single circuit line (88.5km, 2x1700 MVA).	2029	Design & Permitting	Rescheduled	Changes on the generation side (in relation to other types of generation)
141	Ishøj / Bjæverskov (DK)	Bentwisch (DE)	Three offshore windfarms connected to shore combined with 400 MW interconnection between both countries. New technical solution: HVDC VSC Converter moved from offshore to shore	2018	Design & Permitting	Investment on time	New design due to result of tendering process offers exceeding expected prices by far.
142	Tonstad (NO)	Wilster (DE)	A 514 km 500 kV HVDC subsea interconnector between southern Norway and northern Germany.	2018	Design & Permitting	Investment on time	Progressed as planned
406	(Southern part of Norway) (NO)	(Southern part of Norway)(NO)	Voltage uprating of existing 300 kV line Sauda/Saurdal - Lyse - Ertsmyra - Feda - 1&2, Feda - Kristiansand; Sauda-Samnanger in long term. Voltage upgrading of existing single circuit 400kV OHL Tonstad-Solhom-Arendal. Reactive power devices in 400kV substations.	2020	Design & Permitting	Investment on time	Progressed as planned
144	Audorf (DE)	Kassö (DK)	Step 3 in the Danish-German agreement to upgrade the Jutland-DE transfer capacity. It consists of a new 400kV route in Denmark and In Germany new 400kV line mainly in the trace of a existing 220kV line.	2020	Planning	Rescheduled	Planning ongoing minor delay due to coordination with project 183.1018

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
447	Heisdorf (LU)	Berchem (LU)	Erection of a new 20km 225kV double-circuit mixed (cable+OHL)line with 1000 MVA capacity in order to create a loop around Luxembourg city including substations for in feed in lower voltage levels.	2017	Under Construction	Investment on time	Substation Blooren is under construction, line section Heisdorf Blooren is under construction
446	Schifflange (LU)		As a first interim step a PST is commissioned in 2016 in Schifflange and connected to an existing OH-line with an additional 3.5km cable between Biff(CREOS-LU) and Substation Bascharage (CREOS-LU).	2016	Under Construction	Investment on time	Phase shift transformer commissioned July 2014, delivery June 2015, in operation December 2015- interconnection BE-LU in operation with limited cross border capacities until invest. item 447 LUXRING is finalized
650	Bascharage (LU)	Aubange (BE)	BELUX Long-Term: in a second step a new 220 kV interconnection between substation Bascharage (CREOS-LU)and substation Aubange (ELIA-BE) is envisioned via a 16km double circuit underground cable with a total capacity of 1000 MVA. The final technical solution with potential addition of PST's on the cables is subject to further studies taking into account the robustness of the solution towards the different visions.	2022	Under Consideration	Rescheduled	Robustness of the envisioned solution towards the long-term perspective of the energy transition is subject of ongoing studies.
160	Offshore-Wind park Nordergründe (DE)	Inhausen (DE)	New AC-cable connection with a total length of 32km.	2016	Under Construction	Investment on time	on time relative to TYNDP14
163	Cluster HelWin1 (DE)	Büttel (DE)	New HVDC transmission system consisting of offshore platform, cable and converters with a total length of 133km. Line capacity: aprox. 576 MW.	2014	Commissioned	Investment on time	in operation
164	Cluster SylWin1 (DE)	Büttel (DE)	New line consisting of underground +subsea cable with a total length of 206 km. Line capacity: aprox.864MW.	2015	Under Construction	Investment on time	
165	Cluster DolWin1 (DE)	Dörpen/West (DE)	New line consisting of underground +subsea cable with a total length of 167 km. Line capacity: 800MW.	2015	Under Construction	Delayed	delay is due to long permitting process

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
167	Cluster BorWin2 (DE)	Diele (DE)	New HVDC transmission system consisting of offshore platform, cable and converters with a total length of 205km. Line capacity: 800MW.	2015	Commissioned	Investment on time	
655	Cluster DolWin3 (DE)	Dörpen/West (DE)	New HVDC transmission system consisting of offshore platform, cable and converters with a total length of 162 km. Line capacity: 900 MW	2017	Under Construction	Investment on time	on time
657	Cluster HelWin2	Büttel (DE)	New HVDC transmission system consisting of offshore platform, cable and converters with a total length of 133 km. Line capacity: 690 MW	2015	Under Construction	Investment on time	on time
654	Cluster DolWin2 (DE)	Dörpen/West (DE)	New HVDC transmission system consisting of offshore platform, cable and converters with a total length of 138 km. Line capacity: 900 MW	2015	Under Construction	Investment on time	on time
86	Foggia (IT)	Villanova (IT)	New 178km double circuit 400kV OHL between existing Foggia and Villanova 400kV substations, also connected in and out to the Larino and Gissi substations.	2019	Design & Permitting	Investment on time	the part Foggia-Gissi still under authorization; the part Villanova Gissi is under construction
91	Foggia (IT)	Benevento II (IT)	Upgrade of the existing 85km Foggia-Benevento II 400kV OHL.	2014	Commissioned	Investment on time	Progressed as planned
96	Deliceto (IT)	Bisaccia (IT)	New 30km single circuit 400kV OHL between the future substations of Deliceto and Bisaccia, in the Candela area.	2018	Design & Permitting	Delayed	delay in the permitting process (EIA)
194	OWF Cluster Baltic Sea East (DE)	Lüdershagen/ Lubmin (DE)	Grid Connection of offshore wind farms (using AC-technology). According to german law, the grid connection has to be constructed and operated by the TSO (50Hertz Transmission).	2031	Under Construction	Investment on time	The investment is split into different stages with different commissioning dates (starting in 2017) depending on the predicted installed capacity of offshore wind. For further information see the national "Offshore Grid Development Plan"
195	wind farm cluster Baltic Sea West (DE)	Bentwisch/Lüdershagen (DE)	Grid Connection of offshore wind farms (using AC-technology). According to german law, the grid connection has to be constructed and operated by the TSO (50Hertz Transmission).	2032	Design & Permitting	Investment on time	The investment is split into different stages with different commissioning dates (starting in 2026) depending on the predicted installed capacity of offshore wind. For further information see the national "Offshore Grid Development Plan"

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
212	Isar/Altheim/ Ottenhofen	St. Peter (AT)	New 400kV double circuit OHL Isar - St. Peter including new 400kV switchgears Altheim, Pirach, Simbach and St. Peter.	2020	Design & Permitting	Delayed	Delay due to long permitting process
216	St. Peter (AT)	Tauern (AT)	Completion of the 380kV-line St. Peter - Tauern. This contains an upgrade of the existing 380kV-line St. Peter - Salzburg from 220kV-operation to 380kV-operation and the erection of a new internal double circuit 380kV-line connecting the substations Salzburg and Tauern (replacement of existing 220kV-lines on optimized routes). Moreover the erection of the new substations Wagenham and Pongau and the integration of the substations Salzburg and Kaprun is planned.	2021	Design & Permitting	Delayed	Significant delays in the authorisation process (EIA).
219	Westtirol (AT)	Zell-Ziller (AT)	Upgrade of the existing 220kV-line Westtirol - Zell-Ziller and erection of an additional 220/380kV-Transformer. Line length: 105km.	2021	Planning	Investment on time	Progressed as planned
689	Vöhringen (DE)	Westtirol (AT)	Upgrade of an existing over head line to 380 kV, extension of existing and errection of new 380-kV-substations including 380/110-kV-transformers. Transmission route Vöhringen (DE) -Westtirol (AT). This project will increase the current power exchange capacity between the DE, AT.	2020	Planning	Investment on time	Progressed as planned.
214	Gabcikovo (SK)	Gőnyü area (HU)	New interconnection (new 2x400 kV tie-line) between SK and HU starting from Gabčíkovo substation (SK) to the Gőnyü substation on Hungarian side (preliminary decision). Project also includes the erection of new switching station Gabčíkovo next to the existing one.		Cancelled	Cancelled	In TYNDP16 this investment will be merged with the SK investment "2x400kV OHL Gabcikovo-Velky Dur" as a new investment. This technical solution change is caused by the environmental restrictions of the SK-HU cross-border line original technical solution.
696	Sajóivánka (HU)		2x70 Mvar shunt reactors in station Sajóivánka (HU)	2018	Planning	Investment on time	Progressed as planned

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
697	Sajóivánka (HU)		Second 400/120 kV transformer in station Sajóivánka (HU)	2018	Planning	Investment on time	Progressed as planned
698	Győr (HU)		70 Mvar shunt reactor in station Győr (HU)	2024	Planning	Rescheduled	Investment rescheduled as a result of changes in load forecast
699	Győr (HU)		Third 400/120 kV transformer in station Győr (HU)	2024	Planning	Rescheduled	Investment rescheduled as a result of changes in load forecast
695	Rimavská Sobota (SK)	Sajóivánka (HU)	Connection of the two existing substations (R.Sobota (SK) - Sajoóivánka (HU)) by the new 2x400 kV line (preliminary armed only with one circuit).	2018	Design & Permitting	Investment on time	Investment's preparation proceeds in line with joint SK-HU negotiations. Any delays are expected.
720	Veľké Kapušany (SK)	tbd (HU)	Erection of new 2x400 line between SK and Hungary (substation on Hungarian side still to be defined). The Investment is under consideration.	2029	Under Consideration	Rescheduled	Investment is dependent on the future operation of the SK-UA existing cross-border line, which has been prolonged till around 2030 based on the diagnostics.
121	Bickigen (CH)	Romanel (CH)	Construction of different new 400kV OHL sections and voltage upgrade of existing 225kV lines into 400kV lines. Total length: 250km.	2020	Design & Permitting	Investment on time	Progressed as planned
122	Chippis (CH)	Lavorgo (CH)	Construction of different new 400kV line sections and voltage upgrade of existing 225kV lines into 400kV. Total length: 120km.	2020	Design & Permitting	Investment on time	Progressed as planned
123	Mettlen (CH)	Ulrichen (CH)	Construction of different new 400kV line sections and voltage upgrade of existing 225kV lines into 400kV lines. Total length: 90km.	2019	Planning	Investment on time	Progressed as planned
125	Schwanden (CH)	Limmern (CH)	New 400kV double circuit (OHL and underground cable) between Schwanden and Limmern. OHL part	2015	Under Construction	Investment on time	Progressed as planned

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
126	Golbia (CH)	Robbia (CH)	New 2x 400kV cable connection between Golbia and the Bernina line double circuit.	2025	Under Consideration	Rescheduled	Swissgrid has issued its new national strategic grid, and this investment is no longer in the (in the TYNDP 2016 jargon) mid-term category
127	Magadino (CH)	Verzasca (CH)	Upgrade of existing 150kV line into 220kV line.	2020	Under Consideration	Investment on time	Progressed as planned
128	Bâtiaz (CH)	Nant de Drance (CH)	New 400kV double circuit OHL between Bâtiaz and Châtelard. New 2x 400kV cable connection between Châtelard and Nant de Drance. Total length: 22km.	2020	Design & Permitting	Investment on time	Progressed as planned
302	Vyskov (CZ)	Cechy stred (CZ)	New second circuit 400kV OHL; Target capacity 2x1730 MVA.	2016	Under Construction	Investment on time	Progress as indicated in TYNDP 2014
303	Babylon (CZ)	Bezdecin (CZ)	New second circuit 400kV OHL; 1700 MVA.	2018	Design & Permitting	Investment on time	Progress as indicated in TYNDP 2014
304	Babylon (CZ)	Vyskov (CZ)	New second circuit 400kV OHL; 1700 MVA.	2019	Design & Permitting	Ahead of time	Rescheduling due to construction phases harmonization of several investments
140	Eisenhüttenstadt (DE)	Plewiska (PL)	Construction of new 400 kV double circuit line Plewiska (PL)-Eisenhüttenstadt (DE) creating an interconnector between Poland and Germany.	2030	Under Consideration	Rescheduled	The decision on the realization of the investment has been postponed. Alternative developments (internal reinforcements) will be realized to ensure the same cross border effect.
353	Krajnik (PL)	Baczyna (PL)	Construction of new 400 kV double circuit line Krajnik – Baczyna.	2020	Planning	Investment on time	Investment is in the tendering procedure.

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
355	Mikułowa (PL)	Świebodzice (PL)	Construction of new 400 kV double circuit line Mikułowa-Świebodzice in place of existing 220 kV line.	2020	Planning	Investment on time	The investment will enter the tendering procedure as of beginning of 2016 and will be realized in design and build scheme.
726	Gubin (PL)		New 400 kV substation Gubin located near the PL-DE border. The substation will be conntected by the new line Plewiska (PL)-Eisenhüttenstadt (DE).	2030	Under Consideration	Rescheduled	The project is under consideration and will be realized if the decision on the construction of the third PL-DE line will be taken.
727	Plewiska (PL)		Construction of new substation Plewiska Bis (PL) to connect the new line Plewiska (PL)-Eisenhüttenstadt (DE).	2030	Under Consideration	Rescheduled	Due to change of plans of investments 58.140 and 58.726 this investment is also no longer associated with cross border development. However the same location for new substation is under consideration regarding the needs of local distribution operator.
376	Alytus (LT)	PL-LT border	Construction of 500 MW Back-to-Back convertor station near Alytus 330kV substation. Construction of double circuit 400kV OHL between Alytus and PL-LT border (51 km).	2015	Under Construction	Investment on time	Progressed as planned
379	Kruonis (LT)	Alytus (LT)	New double circuit 330kV OHL Alytus–Kruonis(2x1080 MVA, 53km).	2016	Design & Permitting	Investment on time	Progressed as planned
369	Siedlce Ujrzanów (PL)	Miłosna (PL)	Construction of new 400 kV line Siedlce Ujrzanów - Miłosna.	2015	Under Construction	Investment on time	The project is in the construction phase.
368	Ełk (PL)	PL-LT border	Construction of a new 400 kV interconnector line from Ełk to PL-LT border.	2015	Under Construction	Investment on time	Investment is under construction.
370	Ełk (PL)	Łomża (PL)	Construction of new 400 kV line Ełk-Łomża.	2015	Under Construction	Investment on time	The project is under construction.
371	Ostrołęka (PL)	Narew (PL)	Construction of new 400 kV line Ostrolęka-Łomża-Narew.	2015	Commissioned	Investment on time	Commissioned.
728	Łomża (PL)		Construction of new substation Łomża to connect the line Ełk-Łomża.	2015	Commissioned	Investment on time	Commissioned.

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
729	Ostrołęka (PL)		A new 400 kV switchgear in existing substation Ostroleka (in two stages) with transformation 400/220kV 500 MVA and with transformation 400/110kV 400 MVA.	2015	Under Construction	Investment on time	The project is under construction.
730	Stanisławów (PL)		New substation 400kV Stanisławów will be connected by splitting and extending existing line Miłosna-Narew and Miłosna-Siedlce.	2015	Commissioned	Investment on time	Commissioned.
377	Klaipeda (LT)	Telsiai (LT)	New single circuit 330kV OHL (943 MVA, 85km).	2014	Under Construction	Investment on time	Progressed as planned
385	Grobina (LV)	Imanta (LV)	The reinforcement for Latvian grid project with the new 330kV OHL construction and connection to the Riga node. New 330kV OHL construction mainly instead of the existing 110kV double circuit line route, 110kV line will be renovated at the same time and both will be assembled on the same towers. Length 380km, Capacity 800MW	2018	Under Construction	Investment on time	Progressed as planned
383	Klaipeda (LT)	Nybro (SE)	(NordBalt) A new 300kV HVDC VSC partly subsea and partly underground cable between Lithuania and Sweden	2015	Under Construction	Investment on time	Progressed as planned
386	Kilingi-Nomme (EE)	R-TEC2 (LV)	330 kV AC OHL between Kilingi-Nõmme substation in Estonia and R-TEC2 substation in Latvia. New 330 kV power transmission line is planned to take route along already existing 110 kV power transmission lines, by constructing both 110 kV and 330 kV lines on the same towers. Under the framework of the project it is planned to reconstruct the open-air switchyard of the 330/110 kV substation „TEC-2" by constructing new open-air connection point for the 330 kV line „Kilingi Nomme-TEC-2".	2020	Planning	Investment on time	Progressed as planned

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
735	Harku (EE)	Sindi (EE)	New double circuit OHL with 2 different voltages 330 kV and 110 kV and with capacity 1143 MVA/240 MVA and a length 175 km. Major part of new internal connection will be established on existing right of way on the western part of Estonian mainland.The investment helps together with 3rd EE-LV interconnector to increase interarea capacity up to 600 MW.	2020	Design & Permitting	Rescheduled	Svenska kraftnät has changed estimated time for the permission process due to new information.
739	Ulvila (FI)	Kristinestad (FI)	Second line part of the four new single circuit 400kV OHL are part of project in upgrading Ostrobothnian 220kV system into 400kV, and strengthening the 400 kV grid in Northern Finland. total length of lines: 520 km. Total Expected capacity: 1850 MVA.	2014	Commissioned	Investment on time	Investment progresses as planned
740	Hirvisuo (FI)	Pyhänselkä (FI)	Third line part of the four new single circuit 400kV OHL are part of project in upgrading Ostrobothnian 220kV system into 400kV, and strengthening the 400 kV grid in Northern Finland. total length of lines: 520 km. Total Expected capacity: 1850 MVA.	2016	Under Construction	Investment on time	Station name updated from Ventusneva to Hirvisuo. Investment decision has been made and schedule has been updated.
129	Beznau (CH)	Mettlen (CH)	Upgrade of the existing 65km double circuit 220kV OHL to 400kV.	2020	Design & Permitting	Investment on time	Progressed as planned
130	La Punt (CH)	Pradella / Ova Spin (CH)	Installation of the second circuit on existing towers of a double-circuit 400kV OHL (50km).	2017	Planning	Investment on time	Progressed as planned
133	Bonaduz (CH)	Mettlen (CH)	Upgrade of the existing 180km double circuit 220kV OHL into 400kV.	2020	Under Consideration	Investment on time	Progressed as planned
134	Bassecourt (CH)	Romanel (CH)	Construction of different new 400kV line sections and voltage upgrade of existing 225kV lines into 400kV lines Construction of a new 400/220 kV substation in Mühleberg (= former investment 132 'Mühleberg Substation')	2020	Design & Permitting	Investment on time	the part between Mühleberg and Romanel is not part of the grid development plan
136	Border area (DE-AT)	Rüthi (CH)	380 kV Rüthi – Meiningen and 380 kV Meiningen - Border Area AT-DE	2022	Under Consideration	Investment on time	Progressed as planned

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136	Border area (DE-AT)	Rüthi (CH)	380 kV Rüthi – Meiningen and 380 kV Meiningen - Border Area AT-DE	2022	Under Consideration	Investment on time	
139	Vierraden (DE)	Krajnik (PL)	Upgrade of existing 220 kV line Vierraden-Krajnik to double circuit 400 kV OHL.	2017	Under Construction	Investment on time	Investment on time.
145	Niederrhein (DE)	Doetinchem (NL)	New 400kV line double circuit DE-NL interconnection line. Length:57km.	2017	Design & Permitting	Delayed	Permitting procedures take longer than expected
146	Area of Oberzier - Aachen/Düren (DE)	Area of Lixhe - Liège (BE)	Connection between Germany (Oberzier) and Belgium (Lixhe)including a +-100km HVDC underground cable, and 2 convertor stations to integrate with substations at Lixhe & Oberzier.	2019	Design & Permitting	Investment on time	The expected commissioning date of 2019 is based on the hypothesis of acquiring all necessary permits as planned, followed by the assessment of the final investment decision currently planned in 2016.
147	Dollern (DE)	Hamburg/Nord (DE)	New 380kV double circuit OHL Dollern - Hamburg/Nord. Length:43km. First circuit 2015, second cicuit 2017	2017	Under Construction	Delayed	Delay due to long permitting process
148	Audorf (DE)	Hamburg/Nord (DE)	New 380kV double circuit OHL Audorf - Hamburg/Nord including two new 380/220kV transformers in substation Audorf and new 380 kV Switchgear in Kummerfeld. Length: 65km.	2017	Under Construction	Delayed	Delay due to long permitting process
149	Dollern (DE)	Stade (DE)	New 380kV double circuit OHL Dollern - Stade including new 380kV switchgear in Stade. Length:14km.	2022	Design & Permitting	Investment on time	on time relative to TYNDP14

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
157	Wahle (DE)	Mecklar (DE)	New 380kV double circuit OHL Wahle - Mecklar including two new substations. Length: 210km.	2018	Design & Permitting	Investment on time	no delay to TYNDP14
177	Goldshöfe (DE)	Bünzwangen (DE)	AC-extension of the "C corridor" at one ending point in Southern Germany towards the consumption areas allowing the existing grid to deal with the additionnal flows from DC-link		Cancelled	Cancelled	Cancelled due to the new project HVDC Area of Segeberg-Area of Wendlingen achieving the same goal.
150	Conneforde (DE)	Fedderwarden (DE)	New 380kV double circuit (OHL, partly underground) Conneforde - Wilhelmshaven (Fedderwarden, former Maade) including new 400kV switchgear Fedderwarden. Length: 35 km.	2018	Design & Permitting	Investment on time	Progressed as planned
151	Wehrendorf (DE)	Ganderkesee (DE)	New line (length: ca. 95km), extension of existing and erection of substations, erection of 380/110kV-transformers.	2017	Design & Permitting	Delayed	Delay due to long permitting process
156	Niederrhein (DE)	Dörpen/West (DE)	New 380 kV double circuit overhead line Dörpen - Niederrhein including extension of existing substations.	2018	Design & Permitting	Investment on time	Progressed as planned
153	Redwitz (DE)	Grafenrheinfeld (DE)	Upgrade of 220kV connection Redwitz - Grafenrheinfeld to 380kV, including new 380kV switchgear Eltmann. Line length: 97km.	2015	Design & Permitting	Delayed	Delayed due to delay of related investment 45.193 and unexpected long permitting process of the investment itself

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
193	Vieselbach (DE)	Redwitz (DE)	New 380kV double-circuit OHL between the substations Vieselbach-Altenfeld-Redwitz with 215km length combined with upgrade between Redwitz and Grafenrheinfeld (see investment 153). The Section Lauchstädt-Vieselbach has already been commissioned. Support of RES integration in Germany, annual redispatching cost reduction, maintaining of security of supply and support of the market development. The line crosses the former border between Eastern and Western Germany and is right downstream in the main load flow direction. The project will help to avoid loop flows through neighboring grids.	2016	Under Construction	Delayed	3rd section (Altenfeld – Redwitz) is under construction now, long permitting process with strong public resistance.
176	Daxlanden (DE)	Eichstetten (DE)	This AC project is necessary in order to evacuate the energy arriving from HVDC corridors towards southern Germany and reinforce the interconnection capacity with Switzerland	2021	Planning	Rescheduled	No significant change
179	Rommerskirchen (DE)	Weißenthurm (DE)	New380 kV overhead line in existing route. Extension and erection of substations incl. erection of 380/110kV-transformers.	2018	Under Construction	Delayed	The section Rommerskrichen to Sechtem is delayed because the permitting procedures take longer than planned. The 36 km section from Sechtem to Weißenturm is already commissioned.
188	Kruckel (DE)	Dauersberg (DE)	New 380 kV over head lines in existing rout. Extension of existing and erection of several 380/110kV-substations.	2021	Design & Permitting	Delayed	Delayed, due to public resistance and intricate construction planning.
335	Ostrołęka (PL)	Olsztyn Mątki (PL)	Construction of new 400 kV line Ostrołęka - Olsztyn Mątki after dismantling of 220kV line Ostrołęka - Olsztyn with one circuit from Ostrołęka to Olsztyn temporarily on 220 kV.	2018	Design & Permitting	Delayed	Delay due to lingering permit granting process (land acquisition, right of way-local municipalities zoning plans).
373	Ostrołęka (PL)	Stanisławów (PL)	Construction of new 400 kV line Ostrołęka-Stanisławów.	2020	Design & Permitting	Investment on time	The investment is in tendering procedure, the contract (design and build scheme) will by signed by Q4 2015.
374	Kozienice (PL)	Siedlce Ujrzanów (PL)	Construction of new 400 kV line Kozienice-Siedlce Ujrzanów.	2019	Design & Permitting	Investment on time	Investment on time.
378	Panevezys (LT)	Musa (LT)	New single circuit 330kV OHL (1080 MVA, 80km).	2022	Planning	Investment on time	Progressed as planned

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
208	Pulgar (DE)	Vieselbach (DE)	Construction of new 380kV double-circuit OHL in existing corridor Pulgar-Vieselbach (103 km). Support of RES and conventional generation integration, maintaining of security of supply and support of market development.	2024	Planning	Investment on time	The project is part of the results of the national grid development plan and included in the list of national interest (Bundesbedarfsplan). Within this process the commissioning dates of the included projects have been aligned with the current situation.
211	Cluster DolWin 4 (NOR 3-2)	Cloppenburg	New HVDC transmission system consisting of offshore platform, cable and converters with a total length of 190km. Line capacity: 900 MW	2023	Under Consideration	Delayed	Delayed due to the long permitting process
227	Banja Luka (BA)	Lika (HR)	New 400kV interconnection line between BA and HR	2022	Under Consideration	Rescheduled	Feasibility study is expected to be launched.
265	Vidno (BG)	Svoboda (BG)	New 400kV double circuit OHL to accommodate 2000 MW RES generation in N-E Bulgaria (Dobruja region). Line length: 2x70km.		Cancelled	Cancelled	Delayed due to lack of funding.
273	Cernavoda (RO)	Stalpu (RO) and Gura Ialomitei (RO)	Reinforcement of the cross-section between the Western coast of the Black Sea (Eastern Romania) and the rest of the system. New 400kV double circuit OHL between existing substations Cernavoda and Stalpu, with 1 circuit derivation in/out in 400 kV substation Gura Ialomitei,situated in the vicinity of the new line. Line length:159km.2x1380 MVA	2019	Design & Permitting	Investment on time	No change of status
275	Smardan(RO)	Gutinas(RO)	Reinforcement of the cross-section between the Western coast of the Black Sea (Dobrogea area) and the rest of the system. New 400kV double circuit OHL (one circuit wired)between existing substations. Line length:140km; 1380 MVA	2020	Design & Permitting	Investment on time	Rapid increase of wind generation connected in the area. Efforts to be made to speed construction.
276	Suceava(RO)	Gadalin(RO)	Reinforcement of the cross-section between developing wind generation hub in Eastern Romania and the rest of the system. New 400kV simple circuit OHL between existing substations. Line length: 260km. 1204 MVA	2021	Design & Permitting	Investment on time	No change of status.

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
223	Cirkovce (SI)	Heviz (HU) Zerjavenec (HR)	The existing substation of Cirkovce(SI) will be connected to one circuit of the existing Heviz(HU) -Zerjavinec(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)-Žerjavenec (HR).	2018	Design & Permitting	Delayed	The investment is delayed due to environmental problems (including re-routing) and problems with cultural heritage authorities
225	Divaca (SI)	Cirkovce (SI)	Upgrading 220kV lines to 400kV in corridor Divaca-Klece-Bericevo-Podlog-Cirkovce.	2020	Design & Permitting	Investment on time	The project is splitted in three phases: 1st phase corridor Divača-Kleče-Beričevo (2020) 2nd phase corridor Beričevo-Podlog (2025 under consideration) 3rd phase corridor Podlog-Cirkovce (2025 under consideration).
256	Maritsa East 1 (BG)	N.Santa (GR)	New interconnection line BG-GR by a 130km single circuit 400kV OHL.	2021	Design & Permitting	Delayed	Delayed due to lack of funding.
257	Maritsa East 1 (BG)	Plovdiv (BG)	New 100km single circuit 400kV OHL in parallel to the existing one.	2019	Design & Permitting	Delayed	Delayed due to difficulties with the acquisition of the land
258	Maritsa East 1 (BG)	Maritsa East 3 (BG)	New 13km single circuit 400kV OHL in parallel to the existing one.	2017	Design & Permitting	Delayed	Delayed due to difficulties with the acquisition of the land
262	Maritsa East 1 (BG)	Burgas (BG)	New 400kV OHL. Line length: 150km.	2021	Design & Permitting	Delayed	Delayed due to difficulties with the acquisition of the land
238	Pancevo (RS)	Resita (RO)	New 131 km double circuit 400kV OHL between existing substation in Romania and Serbia (63 km on Romanian side and 68 km on Serbian side)2x1380 MVA.	2017	Under Construction	Investment on time	On Romanian side the line is under construction and the status on Serbian territory is also under construction

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
269	Portile de Fier (RO)	Resita (RO)	New 116 km 400kV OHL between existing substation 400 kV Portile de Fier and new 400 kV substation Resita; 1380 MVA.	2017	Design & Permitting	Investment on time	No change of status
270	Resita (RO)	Timisoara-Sacalaz-Arad (RO)	Upgrade of existing 220kV double circuit line Resita-Timisoara-Sacalaz-Arad to 400kV double circuit. Line length: aprox. 100 km d.c. + 74,6 km s.c.;2x1380 MVA; 1204 MVA the circuit between Sacalaz and C. Aradului	2022	Design & Permitting	Investment on time	Planned to start after investment 269 is finalized.
235	Tirana(AL)	Pristina (RS)	New 242km 400kV OHL; on 78km the circuit will be installed on the same towers as the Tirana-Podgorica OHL currently in construction ; the rest will be built as single circuit line.	2016	Under Construction	Investment on time	Currently the project is under construction
236	Leskovac(RS)	Shtip (MK)	New 170km 400kV single circuit overhead interconnection between Serbia and FYR of Macedonia.	2015	Under Construction	Delayed	land acquisition
239	Bitola (MK)	Elbasan (AL)	New 150km cross-border single circuit 400kV OHL between existing substation Bitola and Elbasan	2021	Design & Permitting	Rescheduled	additional investigation of feasibility
244	Filippi(GR)	Lagadas (GR)	Connection of the new 400kV substation in Lagadas in Thessaloniki area to the existing substation of Filippi via a new 110km double circuit 400kV OHL.	2017	Design & Permitting	Delayed	Delays in the expropriation and permission process. These issues have been resolved.
380	Visaginas (LT)	Kruonis (LT)	New single circuit 330kV OHL (1080 MVA, 200km) for the internal grid reinforcement.	2022	Under Consideration	Investment on time	Progressed as planned
382	Vilnius (LT)	Neris (LT)	New single circuit 330kV OHL (943 MVA, 50km).	2022	Planning	Investment on time	Investment 61 is postponed in the new national transmission grid development plan. Construction of new NPPP is unclear, so priority was taken to the other internal investments needed.
306	Vitkov (CZ)		New 400/110kV substation equipped with transformers 2x350MVA.	2020	Design & Permitting	Investment on time	Progressed as planned
307	Vernerov (CZ)		New 400/110kV substation equipped with transformers 2x350MVA.	2017	Under Construction	Investment on time	Progressed as planned

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
308	Vernerov (CZ)	Vitkov (CZ)	New 400kV double circuit OHL, 1385 MVA.	2023	Design & Permitting	Delayed	Based on CEPS request the competent authority is still in the process to change the status of the project to "public-interest project".
309	Vitkov (CZ)	Prestice (CZ)	New 400kV double circuit OHL, 2x1730 MVA.	2020	Design & Permitting	Ahead of time	Changes due to the delay of other investment connecting substation Vitkov
312	Mirovka (CZ)		Upgrade of the existing substation 400/110kV with two transformers 2x350MVA.	2020	Design & Permitting	Investment on time	Progressed as planned
314	Mirovka (CZ)	V413 (CZ)	New double circuit OHL with a capacity of 2x1385 MVA and 26.5km length.	2018	Design & Permitting	Ahead of time	Project rescheduled due to changes of transmission projects to harmonize construction phases.
396	Finland North (FI)	Sweden bidding area SE1/SE2	Third single circuit 400kV AC OHL between Sweden and Finland	2025	Under Consideration	Investment on time	Progressed as planned
399	Dingtuna (SE)	Karlslund (SE)	Upgrade of existing single circuit 220kV lines to 400kV. The investment is a part of investment 403	2021	Under Consideration	Investment on time	Progressed as planned

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
747	Bramford (GB)	Twinstead (GB)	Construction of a new transmission route from Bramford to the Twinstead Tee Point creating Bramford - Pelham and Bramford - Braintree - Rayleigh Main double circuits; the rebuild of Bramford substation and the installation of an MSC at Barking.	2023	Design & Permitting	Delayed	Delay in project requirement due to generation going back.
403	Sweden bidding area SE1	Sweden bidding area SE3	Based on a joint Statnett & Svenska Kraftnät study for North-South reinforcements, this contains reinforcements in cut 1 and 2 in Sweden	2025	Under Consideration	Investment on time	Progressed as planned
427	Endrup (DK)	Eemshaven (NL)	COBRA: New single circuit HVDC connection between Jutland and the Netherlands via 350km subsea cable; the DC voltage will be 320kV and the capacity 700MW.	2019	Design & Permitting	Investment on time	Final investment decision obtained, EIA application procedure initiated and tender procedure for cable and converters started.
443	Richborough (GB)	Zeebrugge (BE)	Nemo Project: New DC sea link including 135km of 400kV (voltage level is subject to outcome of detailed engineering) DC subsea cable with 1000MW capacity	2018	Design & Permitting	Investment on time	Final Investment Decision has been taken and confirms the target date of technical commissioning end 2018 with commercial operation in 2019.

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
449	Richborough (GB)	Canterbury (GB)	New 400kV double circuit and new 400kV substation in Richborough connecting the new Belgium interconnector providing greater market coupling between the UK and the European mainland.	2018	Design & Permitting	Investment on time	Investment on time
450	Sellindge (GB)	Dungeness (GB)	Reconductor the existing circuit which runs from Sellindge - Dungeness with a higher rated conductor. This will facilitate the connection of more interconnectors on the South coast and prevent thermal overloading of this area.	2016	Under Construction	Delayed	Delayed by one year due to interconnector progression.
444	Zomergem (BE)	Zeebrugge (BE)	STEVIN The Stevin project envisions the extension of the 380kV backbone to the coastal area, via the construction of new +-50km (40km OHL; 10km cable) double-circuit (3000MVA for each circuit) between Zomergem and Zeebrugge., including the construction of a new substation in Zeebrugge.	2017	Under Construction	Investment on time	State Council procedures no longer pending due to agreements reached with involved stakeholders. Construction phase initiated -planned to be in operation by 31/12/2017
752	Offshore platform(s)	Stevin (Zeebrugge)	The Belgian Offshore Grid envisions the eruption of an offshore hub connected to onshore AC grid (at Zeebrugge) via underground cables, including the necessary reactive compensation for the cables. BOG is subject to the result of ongoing design, legal, ownership & regulatory concertation with stakeholders and presented here into the extent that it would be considered as regulated infrastructure.	2018	Design & Permitting	Investment on time	2018 refers to 1st step in modular construction of an offshore hub. Further evolution subject of ongoing alignment with wind farm developers. BOG is presented here into the extent that it would be considered as regulated infrastructure.
753	Pelham (GB)	Waltham Cross (GB)	Reconductor the existing circuit which runs from Pelham - Rye House - Waltham Cross with a higher rated conductor.		Cancelled	Cancelled	Cancelled due to the slow build-up of generation in the East Anglia area and also in demand within London.

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
754	Hackney (GB)	Waltham Cross (GB)	Uprating and reconductoring of the Hackney - Tottenham - Brimsdown - Waltham Cross double circuits. Construction of a new 400kV substation at Waltham Cross and modifications to the Tottenham substation and the installation of two new transformers at Brimsdown substation.	2022	Under Construction	Rescheduled	Postponed due to the build-up of generation schemes in the East Anglia area and demand increases in London.
755	Hackney (GB)	St. John's Wood (GB)	This is a new Hackney - St. John's Wood 400kV double circuit. It will replace an old asset rated at 275kV that has come to the end of its life.	2022	Under Construction	Rescheduled	Reschedules due to changes in generation background
757	St. John's Wood (GB)	Wimbledon (GB)	New St. John's Wood - Wimbledon 400kV double circuit.	2018	Under Construction	Investment on time	Investment on time
452	Hunterston (GB)	Deeside (GB)	A new 2.4GW (short term rating) submarine HVDC cable route from Hunterston to Deeside with associated AC network reinforcement works at both ends.	2017	Under Construction	Delayed	Delay due to complexity in construction phase
453	Peterhead (GB)	Hawthorn Pit (GB)	A new ~2GW submarine HVDC cable route from Peterhead to Hawthorn Pit with associated AC network reinforcement works at both ends with possible offshore HVDC integration in the Firth of Forth area.	2023	Under Consideration	Rescheduled	Changes in the generation background
458	Hinkley Point (GB)	Seabank (GB)	New 400kV substation at Hinkley Point. New 400kV transmission route from Hinkley Point to Seabank. Reconstruction of Bridgewater substation for 400kV operation. Uprate Bridgewater - Melksham to 400kV.	2022	Design & Permitting	Rescheduled	Based on current the generation connection dates the investment has been rescheduled.
769	Wylfa (GB)	Pembroke (GB)	A new ~2GW submarine HVDC cable route from Wylfa/Irish Sea to Pembroke with associated AC network reinforcement works at both ends.	2024	Under Consideration	Investment on time	Progressed as planned
424	Kvilldal (NO)	Blythe (GB)	A 720 km long 500 kV 1400 MW HVDC subsea interconnector between western Norway and eastern England.	2020	Design & Permitting	Investment on time	Progressed as planned

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
462	Woodland (IE)	Turleenan (NI)	A new 140 km single circuit 400 kV 1500 MVA OHL from Turleenan 400/275 kV in Northern Ireland to Woodland 400/220 kV in Ireland. This is a new interconnector project between Ireland and Northern Ireland.	2017	Design & Permitting	Investment on time	Progressed as planned
463	Srananagh (IE)	New substation in South Donegal (IE)	A new EHV overhead line from Srananagh in Co. Sligo to a new substation in south Co. Donegal	2020	Planning	Investment on time	Progressed as planned
779	F. Alentejo (by Ourique)	Tavira (by Ourique)	New 122km double-circuit 400+150 kV OHL F. Alentejo-Ourique-Tavira. The realization of this connection can take advantage of some already existing 150kV single lines, which can be reconstructed as double circuit line 400+150kV, investments needs the investment which consist of the extension of existing Ourique substation to include 400 kV facilities.	2025	Planning	Investment on time	Project on time
780	Ourique (PT)		Extension of existing Ourique substation to include 400 kV facilities.	2025	Planning	Investment on time	Project on time
781	Under Consideration (GB)	Under Consideration (GB)	A very high level indication of the works required for GB East Coast. In detail the projects will consist of multiple offshore HVDC and AC circuits and connecting platforms joining to multiple onshore connection points with their own reinforcement requirements. It enables significant connection of offshore windfarms and provides alternative to onshore reinforcement at a cheaper overall cost.	2026	Under Consideration	Rescheduled	Changes on the generation background
782	Under Consideration (GB)	Under Consideration (GB)	Connection of Triton Knoll, Doggerbank & Hornsea GB Wind Farms and all associated works. This is in the region of 11GW of offshore generation.	2026	Under Consideration	Rescheduled	Rescheduled due to changes in the generation timescales.
436	Idomlund (DK)	Endrup (DK)	New 74km single circuit 400kV line via cable with capacity of approx. 1200MW.		Cancelled	Cancelled	new connection point for Viking link facilitates avoiding this link.
438	Eemshaven (NL)	Diemen (NL)	New 175-200km AC overhead line with capacity of 2x2650 MVA of 380kV. In the first phase a connection between Eemshaven Oude Schip and Vierverlaten will be built as well as an upgrade of the existing line Diemen - Lelystad - Ens. Last phase of the project expected after 2025.	2023	Design & Permitting	Rescheduled	Changes in plans of thermal plants at Eemshaven offers the opportunity to phase the grid expansions. The a first phase consists of a new 380 kV connection between Eemshaven-Oudeschip and Vierverlaten and the upgrade the circuits form Diemen-Lelystad-Ens

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
439	Borssele (NL)	Tilburg (NL)	New 100-130km double-circuit 380kV OHL with 2x2650 MVA capacity. Phase 1:2019; phase 2 2025.	2023	Design & Permitting	Delayed	With a 380 kV substation at Rilland, the Zuid-West 380 kV project can be taken into service in two parts. The first part consists of the Borssele Rilland line including substation Rilland and the second part consist of the Rilland – Tilburg line.
440	Maasvlakte (NL)	Beverwijk (NL)	New 380 kV double-circuit mixed project (OHL+ underground cable) including approximately 20km of underground cable for 2650 MVA. The cable sections are a pilot project. The total length of cable at 380kV is frozen until more experience is gained.	2019	Under Construction	Delayed	Permitting procedures took longer than expected. The part from Maasvlakte to Bleiswijk has been commisssioned.
441	Zwolle (NL)	Maasbracht (NL)	Upgrade of the capacity of the existing 300km double circuit 380kV OHL to reach a capacity of 2x2650 MVA along the Dutch Central ring (Hengelo-Zwolle-Ens Diemen-Krimpen-Geertruidenberg-Eindhoven-Maasbracht); First phase 2019; last phase 2025	2019	Planning	Investment on time	The investment is merged with the Ring Zuid project
795	Schwanden (CH)	Limmern (CH)	New 400kV double circuit (OHL and underground cable) between Schwanden and Limmern. Underground cable part	2015	Under Construction	Investment on time	Progressed as planned
796	Krajnik (PL)		Upgrade of 400/220 kV switchgear in substation Krajnik (new 400/220 kV switchyard).	2017	Design & Permitting	Investment on time	The commissioning date was adjusted to optimize the planning and development of transmission system.
799	Mikułowa (PL)		Installation of new Phase Shift Transformer in substation Mikułowa and the upgrade of substation Mikułowa for the purpose of PST installation.	2015	Under Construction	Investment on time	Investment on time.

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
801	Keminmaa (FI)	Pyhänselkä (FI)	Integration of new generation + increased transmission capacity demand.	2024	Planning	Investment on time	Investment progresses as planned, rescheduled slightly since last TYNDP due to expected development on the drivers behind the investment.
809	Dunstown (IE)	Pentir (GB)	A new HVDC subsea connection between Ireland and Great Britain; this may be achieved by a direct link or by integrating an interconnector with a third party connection from Ireland to GB.	2025	Under Consideration	Investment on time	Progressed as planned
810	Great Island or Knockraha (IE)	La Martyre (FR)	A new HVDC subsea connection between Ireland and France	2025	Under Consideration	Investment on time	Progressed as planned
811	Tarnita (RO)	Mintia (RO)	New double circuit 400kV OHL Tarnita(RO)-Mintia(RO) 2x1380 MVA.		Cancelled	Cancelled	The project shall be built only if the Hydro Pumped Storage plant shall be built. Final investment decision is pending.
812	Tarnita (RO)	Cluj E - Gadalin (RO)	New double circuit 400kV OHL Tarnita(RO)- Cluj E-Gadalin (RO) 2x1380 MVA.		Cancelled	Cancelled	The project shall be built only if the Hydro Pumped Storage plant shall be built. Final investment decision is pending.
508	Ramis (ES)		New 400kV substation in La Farga with two 400/220kV transformers; connection as input/output in Santa Llogaia - Bescano line	2016	Design & Permitting	Delayed	Final phase of permitting. Investment pending of its publication in the BOE.

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
813	Tarnita (RO)		New 400kV substation connecting 1000 MW Hydro Pumped Storage Tarnita Lapustesti to the grid.		Cancelled	Cancelled	The project shall be built only if the Hydro Pumped Storage plant shall be built. Final investment decision is pending.
509	Santa Llogaia (ES)		New 400kV substation Sta.Llogaia.	2014	Commissioned	Investment on time	The investment progressed as previously planned
522	Sama (ES)		New 400kV substation Sama in the new Asturias Ring with connection to Lada and a new reactance.	2020	Planning	Rescheduled	Changes due to correlation with Asturias Ring (investment 928)
523	Reboria (ES)		New 400kV substation Reboria in the Asturian ring with 1 transformer 400/220 kV	2020	Planning	Rescheduled	Changes due to correlation with Asturias Ring (investment 928)
524	Costa Verde (ES)		New 400kV substation Costa Verde in the Asturian Ring with 2 new transformer units 400/220 kV	2026	Under Consideration	Investment on time	The investment progressed as planned
537	Mudejar (ES)		New 400kV substation Mudejar and connection to the axis Aragón-Teruel	2016	Under Construction	Investment on time	The investment progressed as previously planned
538	Morella (ES)	La Plana(ES)	Southern part of the new Cantabric-Mediterranean axis. New double circuit Morella-la Plana 400kV-OHL.	2018	Design & Permitting	Investment on time	The investment progressed as previously planned

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
733	Ekhyddan (SE)	Nybro/Hemsjö (SE)	New single circuit 400 kV OHL. A key investment to accomplish full utilization of the NordBalt cable between Lithuania and Sweden (project 60) at all times.	2023	Design & Permitting	Delayed	Main reasons for delay are:- Permission for access to land corridor for the grids planned route from land owners more difficult than previous foreseen. -Svenska kraftnät has changed estimated time for the permission process due to new information.
545	Escatron (ES)	La Secuita (ES)	New single circuit Escatrón-Els Aubals-La Secuita 400kV OHL.	2027	Under Consideration	Investment on time	The investment progressed as previously planned
546	Els Aubals (ES)		New 400kV substation in Els Aubals.	2027	Under Consideration	Investment on time	The investment progressed as previously planned
547	La Secuita (ES)		New 400kV substation in La Secuita with 400/220kV transformer.	2027	Under Consideration	Investment on time	The investment progressed as previously planned
786	Ängsberg (SE)	Horndal (SE)	New 85 km single circuit 400kV OHL. The investment is a part of investment 403	2021	Under Consideration	Investment on time	Progressed as planned
787	Horndal (SE)	Dingtuna (SE)	New 90 km single circuit 400kV OHL	2021	Under Consideration	Investment on time	Progressed as planned
788	Hamra (SE)	Dingtuna (SE)	New 50km single circuit 400kV OHL	2023	Under Consideration	Investment on time	Progressed as planned
806	Råbäcken (SE)	Trolltjärn (SE)	New 55 km single circuit 400kV OHL	2030	Under Consideration	Investment on time	Progressed as planned
561	Cartuja (ES)		New 400kV substation Cartuja with a 400/220kV transformer.	2022	Under Consideration	Investment on time	The investment progressed as previously planned

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
645	Laino (IT)	Altomonte (IT)	New 400kV OHL between the existing substations of Laino and Altomonte in Calabria.	2018	Design & Permitting	Delayed	delay in the permitting process (EIA)
665	Wolmistedt (DE)	Area of Gundremmingen (DE)	New DC- lines to integrate new wind generation from control area 50Hertz especially Mecklenburg-Vorpommern, Brandenburg and Sachsen-Anhalt towards Central/south Europe for consumption and storage.	2022	Planning	Investment on time	Progressed as planned.
663	Cloppenburg East (DE)	Merzen (DE)	New 380-kV double circuit over-head-line Cloppenburg East - Merzen with a total length of ca. 55 km. New errection of a 380-kV substation Merzen.	2021	Planning	Rescheduled	
661	Emden East (DE)	Osterath (DE)	New HVDC-lines from Emden to Osterath to integrate new wind generation especially from North Sea towards Central Germany for consumption.	2025	Planning	Rescheduled	The commissioning date of the Investment has been rescheduled due to the postponing of the development of offshore windfarms in the North Sea.
666	Conneforde (DE)	Cloppenburg (DE)	New 380-kV-line in existing OHL corridor for integration of on- and offshore Wind generation. Incl. new 380-kV-switchgear in Cloppenburg and new transformers in Cloppenburg	2022	Planning	Investment on time	TYDNP 2012 investment 43.A89 is divided in several parts
660	Osterath (DE)	Philippsburg (DE)	New HVDC-lines from Osterath to Philippsburg to integrate new wind generation especially from North Sea towards Central-South Germany for consumption and storage.	2019	Design & Permitting	Investment on time	Progressed as planned.
680	Urberach (DE)	Daxlanden (DE)	New line and extension of existing line to 380 kV double circuit overhead line Urberach - Weinheim - Daxlanden. Extension of existing substations are included.	2022	Planning	Investment on time	Commissioning is planned end of 2021 / beginning of 2022. Therefore the commissioning is set to 2022.
680	Urberach (DE)	Daxlanden (DE)	New line and extension of existing line to 380 kV double circuit overhead line Urberach - Weinheim - Daxlanden. Extension of existing substations are included.	2022	Planning	Investment on time	Commissioning is planned end of 2021 / beginning of 2022. Therefore the commissioning is set to 2022.

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
594	Arkale (ES)		New PST in Arkale-Argia 220 kV interconnection line	2017	Design & Permitting	Delayed	delays associated to the contract process and internal approval of budget including financing
662	Wehrendorf (DE)	Urberach (DE)	New lines in HVDC technology from Wehrendorf to Urberach to integrate new wind generation especially from North Sea towards Central-South Europe for consumption and storage.	2022	Under Consideration	Delayed	The need for this long-term investment was not confirmed by the regulatory authority within the national grid development plan. Therefore further studies on this project are ongoing.
620	Brinje (HR)		New 400/220 kV substation, 1x400 MVA	2021	Planning	Rescheduled	Feasibility study is expected to be launched and it will be financed by EBRD. The Terms of Reference for the study will be finalized soon and will be followed by the process of procurement and contracting
597	La Gaudière (FR)	Rueyres (FR)	New 175-km 400kV double circuit OHL Gaudière-Rueyres substituting to the existing single circuit 400kV OHL	2023	Planning	Investment on time	Further studies performed after TYNDP2014 confirmed the feasibility of the project.
618	Lika(HR)	Velebit(HR)	New 60 km single circuit 400 kV OHL replacing aging 220 kV overhead line	2021	Planning	Rescheduled	Feasibility study is expected to be launched and it will be financed by EBRD. The Terms of Reference for the study will be finalized soon and will be followed by the process of procurement and contracting
633	Konjsko(HR)	Velebit(HR)	New 100km single circuit 400 kV OHL replacing ageing 220 kV overhead line	2021	Planning	Rescheduled	Feasibility study is expected to be launched and it will be financed by EBRD. The Terms of Reference for the study will be finalized soon and will be followed by the process of procurement and contracting
619	Lika (HR)		New 400/110 kV substation, 2x300 MVA	2021	Planning	Rescheduled	Feasibility study is expected to be launched and it will be financed by EBRD. The Terms of Reference for the study will be finalized soon and will be followed by the process of procurement and contracting
617	Lika(HR)	Brinje(HR)	New 55 km single circuit 400 kV OHL replacing aging 220 kV overhead line	2021	Planning	Rescheduled	Feasibility study is expected to be launched and it will be financed by EBRD. The Terms of Reference for the study will be finalized soon and will be followed by the process of procurement and contracting
715	Stalpu (RO)		To reinforce the cross-section between the Black Sea coast wind generation in Romania and Bulgaria and the consumption and storage centers to the West, the 220 kV OHL Stalpu-Teleajen-Brazi is upgraded to 400 kV, as a continuation of the 400 kV d.c. OHL Cernavoda-Stalpu. The 220/110 kV substation Stalpu is upgraded to 400/110kV (1x250MVA).	2019	Planning	Investment on time	No change of status
800	Varna(BG)	Burgas(BG)	New 140km single circuit 400kV OHL in parallel to the existing one.	2020	Planning	Delayed	Delayed due to lack of funding.

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
615	Okroglo (SI)		Installation of a new 400kV PST in Okroglo which is a part of a double 400 kV OHL Okroglo(SI)-Udine(IT).	2030	Under Consideration	Rescheduled	The project is under consideration following to the changing scenario conditions.
616	Slovenia (SI)	Salgareda (IT)	New HVDC link between Italy and Slovenia.	2022	Design & Permitting	Investment on time	Progressed as planned
701	Resita (RO)		New 400 kV substation Resita (T400/220 kV 400 MVA + T 400/110 kV 250 MVA), as development of the existing 220/110 kV substation.	2017	Design & Permitting	Investment on time	Investment has been split. It is expected that the substation will be commissioned in two stages.
705	Timisoara (RO)		Replacement of 220 kV substation Timisoara with 400 kV substation (2x250 MVA 400/110 kV)	2022	Design & Permitting	Investment on time	Investments 269 and 701 have to be finalized first.
625	Lastva (ME)	Pljevlja (ME)	Reinforcement of the Montenegrin internal 400 kV transmission network with new 160 km double circuit 400kV AC OHL between existing substation Pljevlja and new substation Lastva. The investment will enable secure supply of Montenegrin power system and power transits directed to new HVDC link towards Italy. Also, this investment will enable connection of Renewable energy sources along its route.	2016	Under Construction	Investment on time	on time
627	Bajina Basta (RS)	Visegrad (BA)	Description of broader context - New double circuit 400kV OHL connecting existing substation Pljevlja (ME) and substation Bajina Basta (RS) and new double circuit 400kV OHL connecting existing substation Visegrad (BA) and substation Bajina Basta (RS). In the first phase one 400 kV circuit would be equiped. In the second phase New SS Bistrica (RS) would be connected to the exisitng double circuit 400 kV OHL between SS Bajina Basta (RS), SS Visegrad (BA) and SS Pljevlja (ME). Part of regional transmission corridor northeast-southwest.	2022	Design & Permitting	Delayed	These projects are delayed because of delaying investment No 628 double OHL 400 kV B. Basta – Obrenovac and optimistic planning
628	SS Bajina Basta (RS)	SS Obrenovac (RS)	Double circuit 400 kV OHL between upgraded substation Bajina Basta and substation Obrenovac. Part of larger regional transmission corridor northeast-southwest.	2020	Design & Permitting	Delayed	The project is delayed because of need to accommodate Feasibility study (granted by WBIF and done according to WBIF needs) to national law needs.“

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
630	Bajina Basta (RS)	Pljevlja (ME)	Description of broader context - New double circuit 400kV OHL (105km RS + 16km ME) connecting existing substation Pljevlja (ME) and substation Bajina Basta (RS) and new double circuit 400kV OHL connecting existing substation Visegrad (BA) and substation Bajina Basta (RS). In the first phase one 400 kV circuit would be equiped. In the second phase New SS Bistrica (RS) would be connected to the exisitng double circuit 400 kV OHL between SS Bajina Basta (RS), SS Visegrad (BA) and SS Pljevlja (ME). Part of regional transmission corridor northeast-southwest.	2022	Design & Permitting	Delayed	Regional trilateral feasibility study (financed by WBIF and supported by EC) between three TSOs (EMS, NOS BiH and CGES), including ESIA and preliminary design is finished.
631	Bajina Basta (RS)		Upgrade of existing 220/110 kV substation in Bajina Basta to 400/220/110 kV substation as part of overall western Serbia system upgrade to 400 kV voltage level. Part of larger regional transmission corridor northeast-southwest.	2021	Design & Permitting	Delayed	Feasibility study, ESIA and preliminary design finalized (financed by WBIF and supported by EC). Ongoing process of adoption to local legislation needs.
708	Lagadas (GR)		New 400kV substation in Lagadas in Thessaloniki area.	2015	Under Construction	Delayed	Delays due to environmental licensing process
656	Cluster BorWin3	Emden/Ost (DE)	New HVDC transmission system consisting of offshore platform, cable and converters with a total length of 160 km. Line capacity: 900 MW	2019	Under Construction	Delayed	delay is due to long permitting process
658	Cluster BorWin4 (DE)	Area of Wilhelmshaven	New HVDC transmission system consisting of offshore platform, cable and converters with a total length of 172 km. Line capacity: 900 MW	2019	Design & Permitting	Investment on time	Progressed as planned.
659	Cluster SylWin2 (DE)	Büttel (DE)	New HVDC transmission system consisting of offshore platform, cable and converters with a total length of 205 km. Line capacity: 900 MW	2023	Under Consideration	Investment on time	Progressed as planned.

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
664	Brunsbüttel, Wilster, Kreis Segeberg	Großgartach, Wendlingen, Grafenrheinfeld	New DC-lines to integrate new wind generation from Northern Germany towards Southern Germany and Southern Europe for consumption and storage.	2022	Planning	Investment on time	The expected commissioning date is 2017 2022 Substation 2 has been changed from Goldshöfe to the area of Wendlingen
667	Brunsbüttel (DE)	Niebüll	About 135 km new 380-kV-lines and around 10 new transformers for integration of onshore Wind in Schleswig-Holstein and increase of NTC between DE and DK	2018	Planning	Investment on time	The old investment 43.A90 is now divided in several parts. in time relative to TYNDP14
675	Conneforde (DE)	Unterweser (DE)	Upgrade of 220-kV-circuit Unterweser-Conneforde to 380kV , Line length: 32 km.	2024	Under Consideration	Investment on time	on time relative to TYNDP14
676	Dollern (DE)	Elsfleht/West (DE)	New 380 kV line in existing OHL corridor Dollern - Elsfleht/West Length:100 km	2024	Planning	Investment on time	on time relative to TYNDP14
677	Dollern (DE)	Landesbergen (DE)	New 380 kV line in existing OHL corridor Dollern-Sottrum-Wechold-Landesbergen (130 km)	2022	Planning	Investment on time	Progressed as planned.
685	Mecklar (DE)	Grafenrheinfeld (DE)	New double circuit OHL 400-kV-line (130 km)	2022	Planning	Investment on time	Progressed as planned.
682	Großgartach (DE)	Endersbach (DE)	AC-extension of the "C corridor" at one ending point in Southern Germany towards the consumption areas allowing the existing grid to deal with the additionnal flows from DC-link	2018	Design & Permitting	Ahead of time	Standard processing

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
686	Schalkau / area of Altenfeld (DE)	area of Grafenrheinfeld (DE)	New double circuit OHL 380-kV-line (130 km)	2024	Planning	Investment on time	no delay related to TYNDP2014
687	Redwitz (DE)	Schwandorf (DE)	New double circuit OHL 380 kV line in existing OHL corridor Redwitz-Mechlenreuth-Etzenricht-Schwandorf (185 km)	2020	Planning	Investment on time	Progressed as planned.
688	Raitersaich (DE)	Isar (DE)	New 380 kV line in existing OHL corridor Raitersaich - Ludersheim - Sittling - Isar or Altheim (160 km)	2024	Under Consideration	Investment on time	in time relative to TYNDP 2014
889	Hradec		Construction of new PST in substation Hradec with target capacity 2x1700MVA	2016	Under Construction	Investment on time	Progressed as planned
886	tbd	tbd	To allow the grid integration of the planned renewable energy generation (mainly wind power) in the north-eastern part of Austria ("Weinviertel") and to cover the foreseen load growth in that region the transmission grid infrastructure has to be enforced and new substations for the connection need to be erected	2021	Design & Permitting	Investment on time	Start of the authorisation process (EIA) in mid-2016.
742	Pyhänselkä (FI)	Petäjävesi (FI)	New single circuit 400 kV OHLs will be built from middle Finland to Oulujoki Area to increase the capacity between North and South Finland. Will replace existing 220 kV lines.	2023	Design & Permitting	Investment on time	Progresses as planned
894	Sliedrecht area	Dodewaard	New Overhead line from Sliedrecht to Dodewaard of 2x2633 MVA in Wintrack, 65 km. Update: AC solution is unlikely at the moment; other solutions are being considered. Until a new solution is found, this project is kept as it is in TYNDP.	2030	Under Consideration	Rescheduled	This new investment has been identified as a beneficial project in the NSCOGI study and is part of the national grid development plan

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
896	South Donegal (IE)	Omagh South (NI)	A new 275 kV cross border link between a new substation in South Donegal in Ireland and a new substation established south of Omagh in Northern Ireland	2024	Planning	Investment on time	Progressed as planned
897	Omagh South	Turleenan	A new 275 kV overhead line from a new substation established south of Omagh to a new 400/275 kV substation, established at Turleenan by the North South Interconnection Development	2020	Planning	Investment on time	Progressed as planned
914	Cassano (IT)	Chiari (IT)	Upgrade to 380 kV of part of existing 220 kV Cassano Ric.Ovest	2022	Design & Permitting	Investment on time	Progressed as planned
922	Rondissone (IT)	Trino (IT)	Removing limitations on the existing 380 kV Rondissone-Trino	2019	Planning	Investment on time	Progressed as planned
923	Lacchiarella(IT)	Chignolo Po(IT)	Removing limitations on the existing 380 kV Lacchiarella-Chignolo Po	2019	Planning	Investment on time	Progressed as planned
924	Vado (IT)	Vignole (IT)	Removing limitations on the existing 380 kV Vado-Vignole and Vignole-Spezia	2019	Planning	Investment on time	Progressed as planned
927	La Plana/Morella	Godelleta	New 400 kV axis Godelleta-Morella/La Plana (Spain)	2023	Under Consideration	Investment on time	The investment progressed as previously planned
928	GOZON (ES)	SAMA (ES)	Asturian Ring. New double circuit Gozon-Reboria-Sama 400 kV (in a phase I only one circuit will be installed). Subestation Costa Verde is under consideration yet and wont be part of phase I	2020	Planning	Rescheduled	Rescheduled to be commissioned before than expected due to changes on the drivers on demand and generation in the area. It'll be part of new NDP and build as a DC. In a first step only 1 circuit will be installed. Costa Verde won't be part of phase I
929	Cartuja	Arcos	New double circuit Cartuja-Arcos 400 kV	2022	Under Consideration	Investment on time	The investment progressed as previously planned

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
932	Magenta(IT)		new 400 kV section in Magenta substation	2020	Design & Permitting	Investment on time	Progressed as planned
933	Alfa OR Stevin - TBD	Antwerp Area OR Izegem - TBD	To integrate the full potential of 4 GW, additional solutions are needed on top op the 1 GW connection to the Antwerp area. This could take the form of a complementary connection towards Izegem or Brussels, as well as a larger dimensioning of the connection to the Antwerp area. Subject to further studies.	2030	Under Consideration	Investment on time	Long-term potential of energy transition: additional offshore-onshore corridor needed in order to evacuate up to 4GW of offshore wind in the Belgian part of the North Sea.
934	Kemsley (UK) for example - TBD	Doel/Zandvliet (BE) for example - TBD	This investment item envisions the possibility of a second 1GW HVDC connection, between UK (Kemsley) and a Belgian 380kV substation further inland in the Antwerp area (Doel, Zandvliet are indicative locations). Subject to further studies.	2030	Under Consideration	Investment on time	Preliminary studies on high RES scenarios have indicated potential for further regional welfare & RES integration increase by further increasing the interconnection capacity between Belgium & UK.
935	Kreis Segeberg	Göhl	New 380-kV-lineKreis Segeberg - Lübeck - Siems - Göhl, including five new transformers	2021	Under Consideration	Investment on time	On time relative to TYNDP14
937	Audorf	Kiel	New 380-kV-line in existing OHL corridor including 4 new transformers and new 380-kV-switchgears in Kiel/West and Kiel/Süd	2021	Under Consideration	Investment on time	In TYNDP 2012 this investment was part of investment 43.A90 on time relative to TYNDP14
939	Conneforde	Emden/Ost	New 380-kV-line in existing OHL corridor for integration of RES	2019	Planning	Investment on time	In TYNDP 2012 part of investment 43.A89 No delay relative to TYNDP 2014

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
940	Emden/Ost	Halbemond	New 380-kV-line Emden - Halbemond for RES integration incl. new transformers in Halbemond	2021	Planning	Investment on time	In TYNDP 2012 part of investment 43.A89 on time relative to TYNDP 2014
941	Fridão		New substation to connect a new hydro power plant.	2022	Planning	Rescheduled	Due to the expected delay of the connection of new hydro power plants, the commissioning date of this investment item was rescheduled
943	NOR-9-1	Unterweser	Connection of new offshore wind park. New HVDC transmission system consisting of offshore platform, cable and converters with a total length of 255 km. Line capacity: 900 MW	2034	Under Consideration	Delayed	due to new planning
945	NOR-10-1	Unterweser	Connection of new offshore wind parks. New HVDC transmission system consisting of offshore platform, cable and converters with a total length of 260km. Line capacity: 900 MW	2029	Under Consideration	Investment on time	Progressed as planned
946	NOR-11-1	Wilhelmshaven	Connection of new offshore wind parks. New HVDC transmission system consisting of offshore platform, cable and converters with a total length of 230km. Line capacity: 900 MW	2028	Under Consideration	Delayed	Delay due to long permitting process
947	NOR-11-2	Unterweser	Connection of new offshore wind parks. New HVDC transmission system consisting of offshore platform, cable and converters with a total length of 270km. Line capacity: 900 MW	2031	Under Consideration	Investment on time	
948	NOR-12-1	Wilhelmshafen 2	Connection of new offshore wind parks. New HVDC transmission system consisting of offshore platform, cable and converters with a total length of 230km. Line capacity: 900 MW	2029	Under Consideration	Delayed	Delay due to long permitting process

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
950	NOR-13-1	Kreis Segeberg	Connection of new offshore wind parks. New HVDC transmission system consisting of offshore platform, cable and converters with a total length of 330km. Line capacity: 900 MW	2027	Under Consideration	Delayed	Delay due to long permitting process
951	NOR-13-2	Kreis Segeberg	Connection of new offshore wind parks. New HVDC transmission system consisting of offshore platform, cable and converters with a total length of 330km. Line capacity: 900 MW	2030	Under Consideration	Investment on time	Progressed as planned.
952	Cluster DolWin 5 (NOR-1-1)	Cloppenburg/ East	New HVDC transmission system consisting of offshore platform, cable and converters with a total length of 250 km. Line capacity: 900 MW	2021	Under Consideration	Investment on time	Progressed as planned.
953	Cluster DolWin 6 (NOR-3-3)	Halbemond	New HVDC transmission system consisting of offshore platform, cable and converters with a total length of 60km. Line capacity: 900 MW	2021	Under Consideration	Investment on time	Progressed as planned.
954	Cluster BorWin 5 (NOR-7-1)	Halbemond	Connecton of new offshore wind parks. New HVDC transmission system consisting of offshore platform, cable and converters with a total length of 260km. Line capacity: 900 MW	2022	Under Consideration	Investment on time	Progressed as planned.
955	Cluster BorWin6 (NOR-7-2)	Wilhelmshaven	Connection of new offshore wind parks.New HVDC transmission system consisting of offshore platform, cable and converters with a total length of 180km. Line capacity: 900 MW	2024	Under Consideration	Delayed	Delay due to long permitting process
956	Schleswig-Hostein	Baden-Würtemberg / Bavaria	new DC- line in HVDC technology to integrate new wind generation from northern Germany toward soutern Germany and southern Europe for consumption and storage. Connections points north: Brunsbüttel, Wilster, Kreis Segeberg, Stade, Alfsted. South: Großgartach, Goldshöfe, Raitersaich, Vöhringen	2030	Under Consideration	Investment on time	not new in TYNDP2016
958	Güstrow (DE)	Area of Gundremmingen (DE)	New DC- lines to integrate new wind generation from Baltic Sea and control area 50Hertz especially Mecklenburg-Vorpommern towards Central/south Europe for consumption and storage.	2034	Under Consideration	Investment on time	Public resistance and therefore ongoing planning phase.

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
969	lower saxony	NRW	New HVDC line to integrate new wind gerneration especially from North Sea towards Central Germany for consumption and storage. connections points north: Emden, Conneforde. South: Oberzier, Rommerskirchen	2030	Under Consideration	Investment on time	not new compared to TYNDP 2014
970	lower saxony	Hessen/Baden-Würtemberg	New HVDC line to integrate new wind gerneration especially from North Sea towards South Germany for consumption and storage. Connectionspoints north: Cloppenburg, Elsfelth/West. South: Bürstadt, Philipsburg	2030	Under Consideration	Investment on time	not new compared to TYNDP 2014
984	Herbertingen	Tiengen	Herbertingen – Tiengen: Between the two substations Herbertingen and Tiengen a new line will be constructed in an existing corridor. Enhancement of the grid, which will increase transmission capacity noticeably, is needed at the substation Herbertingen.	2020	Planning	Investment on time	Progressed as planned
985	point Rommelsbach	Herbertingen	Rommelsbach – Herbertingen: Between point Rommelsbach and substation Herbertingen a new line will be constructed in an existing corridor. This will significantly increase transmission capacity (grid enhancement).	2018	Planning	Investment on time	Progressed as planned
986	point Wullenstetten (DE)	point Niederwangen (DE)	Point Wullenstetten – Point Niederwangen Between point Wullenstetten and point Niederwangen an upgrade of an existing 380-kV-line is necessary (grid enhancement). Thereby, a significantly higher transmission capacity is realized. The 380 kV substation station Dellmensingen is due to be extended (grid enhancement).	2020	Planning	Investment on time	Progressed as planned
987	Cotentin Nord	Exeter	France-Alderney-Britain (FAB) is a new 220km-long HVDC subsea interconnection between Exeter (UK) and Cotentin Nord (France) with VSC converter station at both ends. Expected rated capacity is 2*700 MW.	2022	Design & Permitting	Investment on time	The project application file was approved by theFrench Ministry in July 2014. Feasibility studies (marine surveys)are in progress to find a suitable subsea route.
988	Vigy	Uchtelfangen or further (tbd)	Upgrade of the existing 400 kV double circuit 400kV OHL from Vigy to Uchtelfangen or beyond to increase its capacity.	2030	Planning	Investment on time	Commissioning date will result from the on-going technical feasibility under investigation.

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
989	Muhlbach	Eichstetten	Operation at 400 kV of the second circuit of a 400kV double circuit OHL currently operated at 225 kV ; some restructuration of the existing grid may be necessary in the area.	2025	Planning	Rescheduled	The detailed timeline of the investment is under definition but it is expected works should be completed slightly before initially thought.
990	Grafenrheinfeld (DE)	Großgartach (DE)	AC-extension of the "C corridor" between two of its ending points in Southern Germany allowing the existing grid to deal with the additionnal flows from DC-link	2020	Planning	Rescheduled	Standard processing
992	Vierraden		Installation of new PSTs in Vierraden	2017	Design & Permitting	Rescheduled	The 380 kV commissioning will be possible after finalization of the new connecting OHL from Vierraden to Neuenhagen (near Berlin) to replace the current 220 kV network and form a new 380 kV grid.
995	Station SE4	Station DE	New DC cable interconnector between Sweden and Germany.	2025	Under Consideration	Investment on time	Progressed as planned
996	LV-Grobina	SE3	A new HVDC link between LV-SE3, only as alternative of interconnector DE-SE4	2030	Planning	Investment on time	Progressed as planned
997	Pleinting (DE)	St. Peter (AT)	new 380-kV-line Pleinting (DE) - St. Peter (AT) on exting OHL corridor	2022	Under Consideration	Investment on time	Investment on time relative to TYNDP14
998	Idomlund (DKW)	Stella West (GB)	2x700 MW HVDC subsea link across the North Seas. New substations on both sides: GB: Bicker Fenn; DK: Revsing	2020	Planning	Ahead of time	Project received connection offer from GB TSO at Bicker Fenn substation. Expected DK substation changed to Revsing. Project accepted for Cap-and-Floor regime by OFGEM'

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
999	Marmagne	Rueyres	Erection of a new 400-kV double circuit line substituting an existing 400-kV single circuit line.	2030	Under Consideration	Investment on time	This long term investment is only needed for scenarios with high RES development in the area, especially wind and hydro; additional studies are in progress for better investment definition.
1000	Malling (DKW)	Kyndby (DKE)	600 MW HVDC subsea link between both DK systems (2 synchr. areas, 2 market areas)	2030	Under Consideration	Investment on time	This project was identified in the first phase of TYNDP14 project and then assessed. It fits to the new category 'Future project candidates': projects under consideration or with expected commissioning date beyond 2030. This means, status is unchanged sin
1004	Sindi	Paide	Reinforcement of existing 330 kV OHL between Paide and Sindi 330 kV substations in Estonia. Old line will be replaced with new towers and wires of 3x400 mm2 in phase. The thermal capacity of the line is planned 1143 MVA. The investment is also a backbone for Baltics Synchronization with CE (project nr 170).	2030	Under Consideration	Investment on time	Progressed as planned.
1005	Sellindge (UK)	Le Mandarins (FR)	Eleclink is a new FR – UK interconnection cable thought the channel Tunnel between Selindge (UK) and Mandarins (FR). Converter stations will be located on Eurotunnel concession at Folkestone and Coquelles. This HVDC interconnection is a PCI project (Project of common interest). It will increase by 1GW the interconnection capacity between UK and FR by 2016.	2018	Design & Permitting	Delayed	Progressed as planned
1008	tbd(FR)	tbd(BE)	The option that will be evaluated envisions the replacement of the current conductors on the axis Lonny-Achène-Gramme with high performance conductors. The integration of complementary flux control measures is subject to further studies depicting the interaction with the 225kV axis Aubange-Moulaine, hereby not excluding that these studies could lead to alternative solutions (new HVDC corridor, upgrade 225kV to 380kV,...).	2030	Under Consideration	Investment on time	Related to the long-term perspective of the energy transition. Subject to further studies given uncertainties around its practical implementation.

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
1010	Tartu	Valmiera	Reinforcement of existing 330 kV OHL with new towers and wires of 3x300 mm2 in phase. The thermal capacity of the line is planned 1000 MVA. The investment is also a backbone for Baltics Synchronization with CE (project nr 170).	2024	Planning	Rescheduled	The project have been moved forward because of prioritisation of the Synchronization project to which all those investments are related to
1011	Tsirguliina	Valmiera	Reinforcement of existing 330 kV OHL with new towers and wires of 3x300 mm2 in phase. The thermal capacity of the line is planned 1000 MVA. The investment is also a backbone for Baltics Synchronization with CE (project nr 170).	2025	Planning	Rescheduled	The project have been moved forward because of prioritisation of the Synchronization project to which all those investments are related to
1012	Balti	Tartu	Reinforcement of existing 330 kV OHL between Balti and Tartu 330 kV substations in Estonia. Old line will be replaced with new towers and wires of 3x400 mm2 in phase. The thermal capacity of the line is planned 1143 MVA. The investment is also a backbone for Baltics Synchronization with CE (project nr 170).	2024	Planning	Rescheduled	The project have been moved forward because of prioritisation of the Synchronization project to which all those investments are related to
1013	Eesti	Tsirguliina	Reinforcement of existing 330 kV OHL between Eesti and Tsirguliina 330 kV substations in Estonia. Old line will be replaced with new towers and wires of 3x400 mm2 in phase. The thermal capacity of the line is planned 1143 MVA. The investment is also a backbone for Baltics Synchronization with CE (project nr 170).	2018	Planning	Rescheduled	The project have been moved forward because of prioritisation of the Synchronization project to which all those investments are related to
1014	Verderio (I)	Sils (CH)	New +/- 400 kV DC cable and subsea link between Switzerland and Italy. Very short AC cable (380 kV) between the site of the converter station and the substation of Sils i.D.	2021	Design & Permitting	Delayed	Progressed as planned
1016	Bjæverskov (DK2)	Bentwisch (DE)	new 600 MW HVDC subsea cable connecting DK2 and DE	2030	Under Consideration	Investment on time	optional candidate project from TYNDP14

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
1018	Niebüll (DE)	Endrup (DKW)	new 380 kV cross border line DK1-DE for integration of RES and increase of NTC	2022	Planning	Investment on time	investigated together with project 39
1020	Dunstown	Pembroke	Greenwire Interconnetor spur 1, enables additional 500MW of interconnection between UK and Irish market	2021	Planning	Delayed	Progressed as planned
1021	Woodland	Pentir	Greenwire Interconnetor spur 2, enables additional 1000MW of interconnection between UK and Irish market	2021	Planning	Delayed	Progressed as planned
1024	Cruachan	Argyll hub	HVDC link between Cruachan (onshore) to Argyll offshore hub	2030	Under Consideration	Investment on time	Progressed as planned
1025	Argyll hub		A new dedicated offshore HVDC hub platform to allow connection of offshore renewable generation and interconnection capacity.	2030	Under Consideration	Investment on time	Progressed as planned
1026	Coleraine hub		A new dedicated offshore HVDC hub platform to allow connection of offshore renewable generation and interconnection capacity.	2030	Under Consideration	Investment on time	Progressed as planned
1027	Coolkeeragh hub		A new dedicated offshore HVDC hub platform to allow connection of offshore renewable generation and interconnection capacity.	2030	Under Consideration	Investment on time	Progressed as planned

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
1028	Argyll	Coleraine	HVDC link between Argyll offshore hub and Coleraine offshore hub	2030	Under Consideration	Investment on time	Progressed as planned
1029	Coolkeeragh	Coolkeeragh hub	HVDC link between Coolkeeragh onshore and Coolkeeragh offshore hub	2030	Under Consideration	Investment on time	Progressed as planned
1030	Coleraine	Coleraine hub	HVDC link between Colerain onshore and Coleraine offshore hub	2030	Under Consideration	Investment on time	Progressed as planned
1031	Coleraine hub	Coolkeeragh hub	HVDC link between Coleraine offshore hub and Coolkeeragh offshore hub	2030	Under Consideration	Investment on time	Progressed as planned
1032	Hunterston	Coleraine hub	HVDC link between Hunterston (onshore) to Argyll offshore hub	2030	Under Consideration	Investment on time	Progressed as planned
1033	Sima	Peterhead	A 650 km long 500 kV 1400 MW HVDC subsea interconnector between western Norway and eastern Scotland.	2022	Design & Permitting	Delayed	Progressed as planned

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
1034	Substation in Lithuania	State border	400 kV interconnection line for synchronous interconnection of Baltics	2023	Under Consideration	Investment on time	Progressed as planned
1035	Baczyna		Construction of new 400/220 kV Substation Baczyna to connect the new line Krajnik-Baczyna.	2019	Planning	Delayed	The investment is in the tendering procedure (design and build scheme). The investment is planned to be completed in Q1 2019.
1036	Siedlce Ujrzanów		New Substation Siedlce Ujrzanów will be connected by new line Miłosna-Siedlce Ujrzanów and later by new line Kozienice-Siedlce Ujrzanów	2015	Under Construction	Investment on time	Under construction.
1037	Ełk Bis		New 400/110 kV Substation Ełk Bis connected by two double 400 kV lines Łomża-Ełk and Ełk-Alytus creating an interconnector Poland-Lithuania.	2015	Under Construction	Investment on time	Investment under construction.
1038	Alytus		Construction of the second 500 MW back-to-Back converter station in Alytus	2020	Planning	Investment on time	Progressed as planned
1039	Volpago (IT)		New 380/220/132 kV substation with related connections to 380 kV Sandrigo Cordignano and 220 KV Soverzene Scorzè where removing limitations are planned	2020	Planning	Investment on time	Progressed as planned
1041	Villanova (IT)	S. Barbara (IT)	Removing limitations on existing 220 kV grid between Villanova e S.Barbara	2020	Planning	Investment on time	Progressed as planned
1043	Neuravensburg	border area (AT)	Point Neuravensburg – Point Austrian National border (AT) Between switching point Neuravensburg and Austrian National border (AT) a new line with a significantly higher transmission capacity will be constructed in an existing corridor (grid enhancement).	2023	Planning	Investment on time	Progressed as planned

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
1045	Lixhe	Herderen	Internal reinforcements in AC network in BE are needed to integrate Alegro, whilst at the same time contributing to security of supply of Liege and Limburg area by securing infeed from 380kV network The reinforcements consist of - extension of existing single 380 kV connection between Lixhe and Herderen by adding an additional circuit in high temperature low sag conductors (HTLS) - construction of 380kV substation in Lixhe with 380/150 transfo - creation of 380kV substation in Genk (André Dumont) with 380/150 kV trafo	2017	Design & Permitting	Investment on time	Progressed as planned.
1048	Lixhe	Herderen	There is a potential project to connect central production at Lixhe substation on top of Alegro (+- 900 MW). Should this scenario happen, then additional internal BE grid reinforcements are needed - second 380 kV overhead line connection between Herderen to Lixhe - installation of a 2nd 380/150 transfo in Limburg area (probably substation André Dumont)	2020	Under Consideration	Investment on time	No decision to date about the potential new production units. This conditional project has a commissioning date set to 2020 to indicate the ~5 year timespan from decision to realization of the investment.
1049	tbd (IT)	tbd (AT)	interconnector IT-AT (phase 2)		Cancelled	Cancelled	feasibility reasons led to cancel the investment

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
1050	Gramme	Van Eyck	Installation of a second circuit on the axis Massenhoven-Meerhout-Van Eyck. Combined with second phase of reinforcement on the axis Gramme-Van Eyck aiming at doubling the capacity over the whole axis by upgrading remaining line sections to high-performance conductors a) 55km double circuit between Gramme-Zutendaal b) 30 km single circuit (Zutendaal - Van Eyck) c) 10 km single circuit (Herderen-Lixhe)	2020	Under Consideration	Investment on time	The need for this project towards 2020-2025 horizon is to be further monitored in accordance with the evolution of the transitflux and the potential of new production units that could be deployed within the area.
1051	CORNIER (FR)	CHAVALON (CH)	Upgrade of the double circuit 225 kV line between Cornier (France) and Riddes and Saint Triphon (Switzerland) to a single circuit 400 kV line between Cornier and Chavalon (Switzerland). In order to take most benefit from this, the existing 400 kV Genissiat substation will be connected in/out to the existing line Cornier-Montagny.	2025	Under Consideration	Investment on time	In-depth feasibility studies are needed to find the most suitable solution taking into accou socio-environmental conditions.
1053	Offshore OR Stevin - TBD	Doel (BE) - TBD	To evacuate up to 3.3 GW wind, thus 1 GW more than currenlty planned, preliminary studies indicated that this corridor could consists of a 1 GW DC connection from an offshore platform or nearby Stevin substation in Zeebrugge towards the Antwerp Area (substation Doel could be a possible location) Subject to further studies.	2030	Under Consideration	Investment on time	Long-term potential of energy transition: additional offshore-onshore corridor needed in order to evacuate up to 4GW of offshore wind in the Belgian part of the North Sea.
1062	RigaCHP2	RigaHPP	Internal reinforcement for Baltic Corridor 600 MW	2020	Under Consideration	Rescheduled	In the previous TYNDP 2014 the investment was selected under the project Baltic corridor ID 163 and initially it was planed as 330 kV OHL between substations Salaspils RigasCHP2. During the CPS for TYNDP 2016 in the RGBS we explored that whole project B

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
1063	TEC1	TEC2	Investment is necessary to strenghtening internal grid in Latvia due to get transmission capacity of 600 MW via Latvia	2030	Under Consideration	Investment on time	Progressed as planned
1064	Viskali (LV)	Musa (LT)	To get 600 MW of capacity via Baltic States additionally.	2030	Under Consideration	Investment on time	Progressed as planned
1065	Aizkraukle (LV)	Panevežys (LT)	To increase transmission capacity by 600 MW via Baltic States	2030	Under Consideration	Investment on time	Progressed as planned
1068	Bescanó	Santa Llogaia	New OHL 400kV AC double circuit Bescano-Santa Llogaia, required to connect the new HVDC interconnection to the existing network and secure the supply in the area of Gerona	2014	Commissioned	Investment on time	Progressed as planned
1069	Mezquita	Morella	Mezquita-Morella 400 kV line	2017	Design & Permitting	Investment on time	Final phase of permitting. Construction will start soon.
1070	Mudejar	Morella	OHL 400kV AC Mudejar-Morella	2017	Under Construction	Investment on time	The investment progressed as previously planned
1071	Würmlach (AT)	Somplago (IT)	Würmlach - Somplago	2018	Design & Permitting	Delayed	Progressed as planned
1075	Kragujevac	Kraljevo	New internal 400 kV OHL will connect existing SS Kragujevac with SS Kraljevo which is planned for upgrade to 400 kV voltage level. This investment will enhance the possibility of energy transits in direction north-east to south-west and east to west.	2018	Design & Permitting	Investment on time	New axis for transits from East to the West, typically from Bulgaria to Bosnia and Montenegro, and further to the west.

TYNDP 2014 Investment Index	Substation 1	Substation 2	Description	Up-to-date expected date of commissioning	Status of the investment	Evolution since TYNDP 2014	Evolution driver
1076	Kraljevo		Upgrade of the existing 220/110kV substation Kraljevo 3 by constructing the 400 kV level.	2018	Design & Permitting	Delayed	"Realization of this project is delayed for one year because of problems with obtaining necessary permits on local level. Now, the problem is resolved and we are in the phase of closing financial structure for its realization."
1082	tbd	tbd	Interco Iceland-UK	2030	Under Consideration	Investment on time	Increased RES integration and market coupling
1099	Rüthi	Bonaduz - Grynau	Rüthi - Grynau 2 x 380 kV Rüthi - Bonaduz 1 x 380 kV	2022	Under Consideration	Investment on time	Progressed as planned
1107	BE (TBD)	DE (TBD)	This investment item envisions the possibility of a second 1 GW HVDC interconnection between Belgium and Germany. Subject to further studies.	2030	Under Consideration	Investment on time	Preliminary studies on high RES scenarios have indicated potential for further regional welfare & RES integration increase by further increasing the interconnection capacity between Belgium & Germany.
1111	Gatica	Indian Queens	Interconnection project between Indian Queens (Great Britain), Cordemais (France) and Gatica (Spain) in a multiterminal HVDC configuration with 3 sections of 1000 MW each, and a submarine route from Spain to Great Britain along the french coast.	2020	Under Consideration	Delayed	Progressed as planned
1112	Svoboda (BG)	splitting point	Construction of a new 400/110kV power line breaking up the existing 400kV Saedinenie OHL and connecting 400/110kV Svoboda substation.		Cancelled	Cancelled	Cancelled due to lack of funding