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1	CSW	Frades B (PT)	Pedralva 1&2 (PT)	Creation of a new 400kV station in Frades B connected to Pedralva by means of two new 400kV, 40km lines. The realisation 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.	Integration of new hydro power plant in the area.	This project will provide higher RES integration and annual grid losses reduction.	design & permitting	2015	
2	CSW	Pedralva (PT)	Alfena (PT)	New 50km double circuit Pedralva (PT) - Alfena (PT) 400kV OHL (only one circuit installed in a first step).	Integration of new renewable generation units (wind & hydro) and strengthen the Security of Supply to Porto area.	Expected benefits regard RES integration, increase of NTC and improved security of supply.	planned	2016	
3	CSW	Pedralva (PT)	Vila Fria (PT)	New 55km double circuit Pedralva - Vila Fria 400kV OHL (one circuit installed), with needed extension of existing Vila Fria substation to include 400kV facilities.	The project is needed to increase the NTC with Spain, improve the capacity of the grid to receive new renewable energy (wind & hydro) in Northern Portugal and secure the supply to Vila Fria.	Expected benefits regard increased NTC, RES integration and improved security of supply.	design & permitting	2013	
4	CSW	Frades B - Ribeira de Pena - Feira (PT)		New 160km double-circuit 400kV OHL Frades B (PT) - Ribeira de Pena (PT) - Feira (PT) (one circuit operated at 220kV between R. Pena and Feira) with a new 400/60kV substation in Rib. Pena. In a first step, only the 130km section Rib. de Pena (PT) - Feira (PT) will be constructed and operated at 220kV as Vila Pouca Aguiar (PT) - Carrapatelo (PT) - Estarreja (PT) (see project 6). In a second step, one circuit of this line will be operated at 400kV.	Integration of new hydro and wind power plant in Northern Portugal.	The project is expected to help RES integration and provide annual grid losses reduction.	planned	2015	
5	CSW	Macedo de Cavaleiros (PT)	Vila Pouca de Aguiar (PT)	New 75km double circuit 400+220kV OHL (only 220kV circuit installed in the first step) Macedo de Cavaleiros (PT) -Valpaços (PT) - Vila Pouca de Aguiar (PT).	Integration of new renewable generation units and strengthen the Security of Supply to PT.	The project is expected to help RES integration (mainly wind) and improved the security of supply. In addition, an increase of ES-PT NTC is expected, due to reinforced exchange capacity on Douro border.	design & permitting	2010	
6	CSW	V. P. Aguiar - Carrapatelo - Estarreja (PT)		New 400+220kV double circuit OHL (initially only used at 220kV) Vila Pouca Aguiar - (Rib. Pena) - Carrapatelo - Estarreja . Total length of line: 2x(90+49)km.	Integration of new renewable generation units and improving the Security of Supply.	RES integration (mainly wind) and improved security of supply.	design & permitting	2012/2013	
7	CSW	Armamar - Bodiosa - Paraimo (PT)		This 120km double-circuit OHL has been constructed according to 400kV standards but is currently operated at 220kV as Valdigem (PT) - Bodiosa (PT) -Paraimo (PT). The project consists of operating one circuit at 400kV while creating a new 400/220kV substation in Armamar and upgrading the existing Bodiosa substation from 220/60kV to 400/60kV. Total length of line : 120km.	Insufficient capability of existing network to accommodate interior to littoral flows.	The project is expected to help RES integration, increase the NTC and improved the security of supply.	under construction	2010	

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8	CSW	V. Chã B - Arg./Góis - Penela - Paraimo / Batalha (PT)		New double circuit 400+220kV OHL (only 400kV circuit installed in a first step) Vila Chã B-Arganil/Gois-Penela (90km) plus new double circuit 400kV OHL (15km) to connect Penela substation to Paraimo - Batalha line. Two new 400/60kV substations at Vila Chã B and Arg./Góis are needed, as well as the expansion of the existing Penela substation to include 400kV facilities.	Insufficient capacity of the existing network to receive new renewable energy (wind and hydro).	The project is expected to help RES integration, improved the security of supply and reduce the annual grid losses.	planned	2015/2016	
9	CSW	Guarda - Ferro B - (C. Branco) - Falagueira (PT)		New double circuit 400+220kV OHL Guarda (PT) -Ferro B (PT) -'Castelo Branco zone' (PT) (between Guarda and Ferro B only the 400kV circuit will be installed) plus new double circuit 400+150kV OHL 'Castelo Branco zone' (PT) Falagueira (PT). New 400/60kV substations in Guarda and Ferro B. Total length of line: 135km.	Insufficient capacity of existing network to receive new renewable energy (mainly wind).	The project is expected to help RES integration, improved the security of supply and reduce the annual grid losses.	planned	2013/2014	
10	CSW	Falagueira (PT)	Pego (PT)	New 40km double circuit 400kV OHL (only one circuit installed) substituting for an existing 150kV line.	Insufficient capacity to receive new renewable (wind and hydro) energy and need for alleviating some congestions near Falagueira (PT) substation.	The project is expected to help RES integration, increase the NTC and reduce annual grid losses.	planned	2014	
11	CSW	Batalha-Lavos-Paraimo (PT)		Two new 400kV lines Batalha-Lavos and Lavos-Paraimo, needed to accommodate two new combined cycle power plants (4x435MW) on Littoral Central Region. Total length: 115km.	Needed to receive new CCGT power plants (4x435MW) that are in construction or permitting in Littoral Central Region.	The project is expected to help conventional generation integration, improved the security of supply and reduce annual grid losses.	under construction	2010/2012	
12	CSW	Rio Maior - Alm. Bispo - Fanhões (PT)		New 71km double circuit 400kV OHL feeding Lisbon area from north with creation of a 400/220/60kV substation in Almagem do Bispo. A section of this reinforcement (between Rio Maior and Carvoeira zone) will be finished earlier included on a 400/220kV double circuit line linking Rio Maior and Carregado substations.	The project is needed to improve the security of supply to Lisbon Area.	The project is expected to improve the security & diversity of supply and reduce annual grid losses.	planned	2016/2019	
13	CSW	Palmela - F. Ferro - Fanhões (PT)		Expansion of Fernão Ferro substation to include 400kV facilities and connection to the existent Palmela (PT) - Fanhões (PT) single circuit line by a new 25km double-circuit 400kV OHL.	The project is needed to improve the security of supply on Setúbal Peninsula area.	The project is expected to improve the security & diversity of supply and reduce annual grid losses.	design & permitting	2012	
14	CSW	Marateca - Pegões - Fanhões (PT)		New 90km double-circuit 400kV OHL (one circuit only installed between Pegões and Fanhões). This new line will be connected to already existing line Palmela (PT) - Sines 2 (PT) , so making a direct link Sines-Pegões (PT) - Fanhões (PT) substations.	Congestions on existing network due to north-to-south flows.	Conventional generation integration, improved security of supply and increase of NTC.	design & permitting	2012	

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15	CSW	Falagueira-Estremoz - Divor - Pegões (PT)		New 400/60kV substations in Pegoes and Divor connected by a new 116km Pegoes (PT) - Divor (PT) - Estremoz (PT) single circuit 400kV OHL. In addition, the operating voltage of the existing Estermoz substations and the 93km single circuit Falagueira (PT) -Estremoz (PT) 150kV OHL will be changed to 400kV (were prepared for that).	Special needs for TGV projects and reinforcement to Estremoz and Évora supply.	The project is expected to improve the security of supply, increase the NTC and reduce annual grid losses.	design & permitting	2012	
16	CSW	Aldeadávila (ES)	Lagoaça (PT) - Armamar (PT) - Recarei (PT)	New Duero Interconnection 400kV New 400kV OHL interconnection line Aldeadávila (ES) - Lagoaça (PT) , including new Lagoaça substation (PT). Also associated, the lines Lagoaça-Armamar-Recarei 400kV in PT and the Armamar (PT) 400/220kV substation. On a first phase (2009) a new 400/220kV substation (Lagoaça - PT) will be created with only 220kV level installed, and there will be some rearrangements and reinforcements on the local 220kV network structure. On river crossing a new 220kV double line with separated circuits, firstly Aldeadavila (ES) - Lagoaça (PT) 1 & 2 and changing later to Aldeadavila (ES) - Pocinho (PT) 1 & 2, will substitute the existing two 220kV lines Aldeadavila (ES) – Bemposta (PT) and Aldeadavila (ES)-Pocinho (PT). Total length: 1km (ES)+105km (PT).	Limitations and congestions on the 220kV network in the Douro area where new hydro power stations (~800MW) are in construction or permitting in Portugal, in addition to export/import situations between Portugal and Spain.	Increase of NTC (From today 1100-1500MW up to 1500-2000MW), RES integration and conventional generation integration. Support in Iberian (ES+PT) market integration in MIBEL.	design & permitting for 400kV under construction for Lagoaça substation and 220kV restructuring in Portugal	2009/2010	X
17	CSW	Guillena (ES)-Puebla de Guzman (ES)	Tavira (PT)-Portimao (PT)	New Southern Interconnection New 400kV OHL double-circuit line between Guillena (ES)-Puebla de Guzman (ES) - Tavira (PT) - Portimão (PT), including new Tavira (PT) and P.Guzman (ES) 400kV substations. On the interconnection section P.Guzmán (ES) –Tavira(PT), initially only one circuit will be placed. Total length: 153km (ES)+110km(PT).	Congestion that occurs on the existing 400kV line Alqueva (PT) -Brovaes (ES) at high level of exportation from Portugal to Spain, limiting exchange capability from Portugal to Spain.	The project is expected to increase NTC (up to 3000MW from Portugal to Spain), help RES integration and improved the security of supply. Support in Iberian (ES+PT) market integration in MIBEL.	design & permitting	2011	X
18	CSW	O Covelo (ES)-Boboras (ES)	Vila Fria (PT)-Vila Conde (PT) - Recarei (PT)	New double circuit 400kV OHL between O Boboras (ES) - O Covelo (ES) - Vila Fria (PT) - Vila do Conde (PT) - Recarei (PT), including new 400kV substations O Covelo (ES), Boboras (ES), Vila Fria (PT) and Vila do Conde (PT). On the section O Covelo (ES) – Vila do Conde (PT), only one circuit will be placed. Total length: 43km (ES)+112km (PT).	Congestion on the existing 400kV line Cartelle (ES) -Lindoso (PT) at high level of exportation from Spain to Portugal. Special needs for High Speed Train projects.	The project is expected to increase NTC (up to 3000MW from Spain to Portugal), help RES integration and improved the security of supply. General Benefit: Market integration in MIBEL.	design & permitting	2014	X
19	CSW	Vic (ES)	Pierola (ES)	Upgrading (uprating) the existing 75km single circuit Vic-Pierola 400kV line in order to increase its capacity from 1360 MVA to 1710 MVA.	Congestions in the FR-ES border. Necessity of adapting the existing network to the new Eastern interconnection.	Increase of NTC and improved of security of supply.	design & permitting	2010	
20	CSW	Arkale (ES)	Hernani (ES)	Upgrading the existing 12km single circuit Arkale-Hernani n°2 220kV OHL in order to increase its capacity up to 670 MVA.	Overloads in this line in high export situations to France.	Increase of NTC and RES integration.	design & permitting	2011	

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21	CSW	Aldeadavila (ES) JM Oriol (ES)	Villarino (ES) Arenales (ES)	Upgrading the existing 18km Aldeadávila-Villarino 400kV OHL in order to increase its capacity from 1350MVA to 1690MVA. New 220kV JM Oriol-Arenales, and new Arenales substation.	Limitations in the NTC values from Portugal to Spain.	Increase of NTC on ES-PT border, around 2000MW from PT to ES in some peak situations. RES integration and annual re-dispatching cost reduction.	design & permitting	2012/2014	
22	CSW	Boimente (ES)	Ichaso (ES)	North axis Project between Galicia and the Basque Country. Part of the project is considered as the Asturias Ring. New 162km double circuit Boimente-Pesoz- Grado 400kV OHL. Change of voltage level of the existing 50km Soto-Tabiella single circuit from 220kV to 400kV, and connection as input/output in Grado. New 178km single circuit Soto-Penagos 400kV OHL. New 96km double circuit Aguayo/Penagos-Abanto 400kV OHL. New 34km double circuit Zierbena-Abanto-Gueñes 400kV OHL. New 120km double circuit Gueñes-Ichaso OHL. New 58km double circuit Gozón-Carrio-Lada -Sama 400kV OHL. It is expected to use the corridors of existing lower voltage lines for some sections. New 124km double circuit Sama-Velilla 400kV OHL. Upgrading (uprating) the 73km single circuit Lada-Robla 400kV OHL in order to increase its capacity by around 300 MVA. It includes new 400kV substations Pesoz, El Palo, Salas, Grado, Gozón, Sama, Carrio, Valle del Nalon, Costa Verde, Penagos, Solorzano, Abanto and Ichaso, with transformers to 220kV.	Congestions in the 400kV lines between the north-western area and the East, because of the attraction of this area as a production site. Congestions in the 220kV network due to the increase of demand in Cantabria, that has today only one 400kV injection from the south. Constraints in the north-to-south direction due to the expected increase of generation in the north-West and north-East areas. Limitations of production of Santurce and Zierbena power plants (high concentration of generation), which sole evacuation line (Santurce-Gueñes) has a slight capacity.	The project is expected to help mainly RES and also conventional generation integration. It will allow to connect regional networks and enhance mutual support. In addition, security and quality of supply in some north Spain areas will be improved.	design & permitting	2010/2015	X
23	CSW	Vitoria (ES)	Magallon (ES)	Northern part of the new Cantabric-Mediterranean axis. New 144km double circuit Castejón-Muruarte-Dicastillo-Vitoria 400kV OHL, with new 400kV substations in Muruarte and Dicastillo with 400/220kV transformers New 32km double circuit La Serna-Magallón 400kV OHL.	The project is needed to accommodate geographical unbalances between production (in Northern Spain) and consumption (Mediterranean area) that otherwise would produce congestion in the 400kV corridors of Valladolid/Palencia-Madrid and Aragón/Cataluña-Levante. Need to alleviate congestion on the 220kV network supplying Pamplona. Also need to alleviate congestions on the 400kV and 220kV network between La Serna and Magallón in several production profiles (mainly with high wind power energy) and after contingencies.	The project is expected to improve RES integration, security of supply and reduce annual re-dispatching cost.	design & permitting	2011/2012	X

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24	CSW	Fuendetodos (ES)	Eliana Turis (ES)	<p>Southern part of the new Cantabric-Mediterranean axis. New 110km double circuit Fuendetodos-Muniesa-Mezquita-Morella 400kV OHL.</p> <p>New 77km double circuit Teruel-Mudejar-Morella 400kV-OHL.</p> <p>New 78km double circuit La Plana-Morella 400kV OHL substituting to the existing single circuit line.</p> <p>New 63km single circuit La Eliana-La Plana 400kV OHL and upgrading (uprating) the existing line.</p> <p>New 162km double circuit Mezquita-Platea-Turis 400kV OHL. As a first step, in 2012, the new Turis substation will be equipped with a 400/220kV transformer and connected to the existing 400kV lines Cofrentes-La Eliana, and Catadau-Requena 400kV lines.</p> <p>New 400kV substations Mezquita, Platea, Muniesa, and Mudejar with 400/220kV transformer units</p> <p>Upgrading (uprating) the existing 76km Aragón-Peñaflor 400kV OHL</p>	<p>The project is needed to accommodate geographical unbalances between north of Spain and Mediterranean area, that otherwise would produce congestion in 400kV existing corridors.</p> <p>Necessity of integration of wind power energy in an area without enough transmission network.</p> <p>In addition, congestion is expected in Levante area because the low capacity of the existing La Eliana-La Plana 400kV OHL is not sufficient to cope with the high flows coming from the northwest to supply the high increase of demand in Levante.</p>	RES integration, improved security of supply and conventional generation integration.	design & permitting	2011/2014	
25	CSW	Aragón (ES) - Isona (ES) & Escatron (ES) - La Secuita (ES)		<p>New 167km double circuit Aragón/Peñaalba-Monzón II-Isona 400kV OHL with new 400kV substations Monzón II and Isona, and a 400/220kV transformer in Monzón II.</p> <p>New 60km single circuit Escatrón-Els Aubals-La Secuita 400kV OHL with a new 400kV substation in Els Aubals with 400/220kV transformer.</p>	Congestion on existing grid due to unbalanced production and consumption between Aragón and Cataluña.	The project is expected to benefit in Annual re-dispatching cost reduction and higher RES & conventional generation integration.	design & permitting	2013/2014	
26	CSW	Catadau (ES)	Benajama (ES)	New 123km double-circuit Catadau-Jijona-Benejama 400kV OHL using the right-of-way of the existing 220kV lines that will be dismantled. A new 400kV substation will be created at Jijona and transformers installed in Jijona and Catadau.	Congestions due to the low capacity of the Benejama-Jijona-Catadau axis, that faces overloads due to high north-to-south flows to supply the Levante demand.	The project should improve the security of supply and reduce the annual grid losses.	design & permitting	2015	
27	CSW	Morvedre (ES)	Santa Ponsa (ES)	<p>Connection of Balearic Islands to Mainland</p> <p>New bipolar 2x200MW HVDC (LCC) 250km connection between Morvedre (mainland) and Santa Ponsa (Mallorca) via 250kV. subsea cable.</p> <p>In addition, Mallorca will be connected to Menorca with a new HVDC 120km link between Santa Ponsa (Mallorca) and Torrente (Menorca).</p> <p>A second connection between Mallorca and Ibiza (60km) will also be constructed.</p>	Need of connecting Balearic Islands (isolated system) to the Continental Europe system through the Spanish mainland.	Expected benefits are an improved security & diversity of supply and connection of isolated areas.	design & permitting	2011	X
28	CSW	Cofrentes (ES)	Pinilla (ES)	New 82km single circuit Cofrentes-Ayora-Campanario-Pinilla 400kV OHL. This project also includes a new 400kV substation in Campanario.	<p>Necessity of mutual support between two axis of 400kV Cofrentes-Benejama-Rocamora and Romica-Rocamora to avoid overloads in contingencies.</p> <p>Look for a possibility to allow more wind power production in the Peñarrubia area.</p>	Expected benefits regard RES integration, annual re-dispatching cost reduction and CO2 emission mitigation.	design & permitting	2012	

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29	CSW	Cartuja (ES)	Guadame (ES)	New 94km double circuit Cartuja-Arcos de la Frontera-La Roda-Cabra-Cordoba-Guadame 400kV OHL . It includes new 400kV substations Cartuja and Cordoba, with 400/220kV transformers.	The concentration of generation (combined cycle and wind power energy) in the Cadiz and Tajo de la Encantada area causes constraints, in contingency situations, in the 400kV and 220kV network in case of high production profiles.	The project will help RES & conventional generation integration and Improved the security of supply.	design & permitting	2010/2013	X
30	CSW	Don Rodrigo (ES)	Almaraz (ES)	Two new double circuit 400kV OHL: Guillena-Guadaira-Don Rodrigo and Guillena-Brovaes-Arroyo S.Servan-Alcuescar- Almaraz. This project also includes new 400kV substations in Arroyo S.Servan, Alcuescar and Guadaira with 400/220kV transformers. Total length : 383km.	Expected overloads in the existing link between Extremadura and Sevilla in both directions, depending on the future production profile (new generation in both areas, but mainly in the south). Limits to the PT-ES NTC due to overloads in Alvarado-Balboa 220kV line in profiles from Portugal to Spain. Necessity of increase the flows to supply the high demand in Madrid.	The project is expected to improve the security of supply and help conventional, RES generation integration and avoid limits to NTC from Portugal to Spain.	design & permitting	2012/2015	
31	CSW	Caparacena (ES)	La Ribina (ES)	New 177km double circuit Caparacena-Baza-La Ribina 400kV OHL, with two new 400kV substations in Baza and La Ribina (these substations will be also connected to existing El Palmar-Litoral 400kV line). In addition, the existing 173km single circuit Litoral-Tabernas-Hueneja-Caparacena 400kV line will be upgraded (uprated) in order to increase its capacity from 1310 to 1590 MVA.	Necessity of integration of wind and solar power energy in addition to a new pump storage in the area of Baza. It takes the advantage to support the distribution. Need to alleviate the overloads in the 400kV Caparacena-Hueneja in some production profiles.	The project is expected to improve RES (especially wind & solar energy) integration, diversity & security of supply.	design & permitting	2012/2013	
32	CSW	several 400kV lines concerned (ES)		Upgrading several 400kV lines in the area between Aldeadávila, the south of Extremadura, Madrid and the Portuguese border.	Need of alleviating expected overloads in some 400kV lines in contingency situation, due to the new generation projects in Extremadura and south of Madrid.	The project should improve security of supply, conventional generation integration and RES integration.	design & permitting	2008/2011	
33	CSW	Romica (ES)	Brazatortas (ES)	Transmanchega project (total length 255km) New double circuit line Romica-Manzanares-Brazatortas 400kV OHL. New substation Manzanares with a 400/220kV transformer unit. The new 400kV substation Brazatorta will be commissioned in 2012 and connected to the existing line Guadame-Valdecaballeros.	The project is needed for integration of wind energy (insufficient capacity of existing network to transmit the power). In addition, the 220kV network supplying Ciudad Real is close to congestion and would need some support.	The project is expected to provide higher RES integration and improved security of supply.	design & permitting	2013/2015	

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34	CSW	Trives (ES)	Moraleja (ES)	SUMA Project (using part of an existing 220kV corridor) New 201km single circuit Trives-Aparecida-Valparaiso-Tordesillas 400kV OHL. New 130km double circuit Tordesillas-Segovia/Herrerros-Galapagar/(El Cereal-SS Reyes) 400kV OHL New 33km double circuit Galapagar-Moraleja 400kV OHL (substituting for the existing line) and new PST in the 400kV line Galapagar-Moraleja. Upgrade of the 21km existing single circuit Loeches-SS Reyes 220kV OHL to 400kV in order to increase its capacity. New 33km double circuit 400kV Mudarra-Tordesillas OHL and upgrade of the existing 25km single-circuit Mudarra-Tordesillas 400kV line in order to increase its capacity. The project includes new 400kV substations in Aparecida and Herrerros .	Congestion from the northwest area to the centre of the country due to the attraction of Galicia as a production site (conventional and wind power plants). The new expected generation in north-Western Spain causes overloads on the lines transmitting the power to Madrid. High flows on Madrid ring cause congestion on the existing Galapagar-Moraleja and SS.Reyes-Loeches 400kV lines.	The project is expected to reduce annual re-dispatching cost, improved the security of supply and help RES integration. It will also help conventional energy integration.	design & permitting	2011/2015	
35	CSW	to be determined (ES)	to be determined (ES)	Reinforcements in the 220kV network overall the country, in addition to upgrading of 300km of 220kV network , due to wind power evacuation.	Lack of network capacity to evacuate wind power energy, and congestion in some 220kV lines.	These projects will provide higher RES integration.	design & permitting	2009/2014	
36	CSW CCS North Sea	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. The thermal capacity is expected in the range 2x825-2x1000MW. Total line length: 60km	Limited NTC in both directions and limitations to the integration of wind power energy in the Iberian Peninsula.	The project will provide increased cross-border capacity, up to 2800 MW from FR to ES (today 1400MW), higher RES integration and improved security of supply. The project increases the security of the system in case of major incidents. Close to the diversity of supply benefits, decrease in CO2 emissions is expected.	design & permitting	2014	X
37	CSW	Santa Llogaia (ES)	Bescanó (ES)	New 119km double circuit Sta.Llogaia-Ramis-Bescano-Vic/ Senmenat 400kV OHL (single circuit in some sections) New 400kV substations in Bescano, Ramis and Sta.Llogaia, with 400/220kV transformers in Ramis and Bescano.	Necessity of adapting the existing network to the new Eastern interconnection. Congestions mainly in the 400kV Vic-Baixas line and in Catalanian area in contingencies. Not enough transmission network for the connection of new generation in the Bescano area and support to the security of supply in the Girona area.	The project will provide an increase of NTC, improved the security of supply and support RES integration.	design & permitting	2010/2012	X
38	CSW CCS North Sea	tbd (ES)	tbd (FR)	New cross-border line - not in the French department "Pyrenees Orientales" nor in the Spanish region of Cataluña.	Limited NTC of the ES- FR border in both directions.	Increase of interconnection capacity, up to 4000MW.	under consideration	long term	X
39	CSW CCS North Sea	Avelin (FR)	Warande (FR)	Reconductoring (with ACSS) of both circuits of existing 400kV OHL between Avelin, Weppes & Warande. Total length : 85km	Need to alleviate congestion due to generation evacuation in Northern France	The project will reduce annual re-dispatching costs and improve the overall capability of the network to accommodate international power exchanges in the area.	under construction	2010	

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40	CSW CCS North Sea	Avelin (FR) Mastaing (FR)		Installation of a 3rd busbar in Avelin (existing 400-kV substation) & replacement of components to increase the ability to withstand short-circuit power; Connection of Mastaing (existing 400kV substation) to existing 400kV circuit between Avelin (FR) & Lonny (FR)	Need to alleviate congestion due to generation evacuation in Northern France	These projects will help conventional generation integration and improve the security of supply and the overall capability of the network to accommodate international power exchanges in the area.	under construction	2012	
41	CSW CCS North Sea	Fruges, Sud-Aveyron, Marne-Sud, Somme (FR)		New 400-kV substations connected to existing 400-kV network and equipped with transformers to 220 kV or high voltage networks	Need to connect new wind generation	These projects will result in higher RES integration.	design & permitting / under consideration	mid term	
42	CSW CCS North Sea	Lonny (FR)	Vesle (FR)	Reconstruction of the existing 70km single circuit 400kV OHL as double circuit OHL.	Need to alleviate congestion on the grid in Northern France (future generation evacuation + exchanges with Belgium)	The project will result in higher RES and conventional generation integration.	under consideration	long term (>=2019)	
43	CSW CCS North Sea	Mandarins (FR)		Replacement of thyristors in the AC/DC substation (IFA 2000 interconnector, DC voltage 270 kV)	Ageing/obsolescence of Mandarins converters	Reduction of infrastructure vulnerability	design & permitting	2011	
44	CSW CCS North Sea	Havre (FR)	Rougemontier (FR)	Reconductoring (with ACCS) of existing 54km double circuit 400kV line.	Need to integrate future conventional generation	The project will improve conventional generation integration, resulting in at least 2000MW generation evacuation capacity in Le Havre area.	design & permitting	2015	
45	CSW CCS North Sea	Taute (FR)	Oudon (FR)	"Cotentin-Maine" Project : new 163km double circuit 400kV OHL connected to existing network via two new substations in Cotentin and Maine regions.	Need to integrate Flamanville 3 nuclear power plant	The project will result in a generation evacuation capacity of 2100 MW in Cotentin area, for conventional units and RES.	design & permitting	2012	
46	CSW CCS North Sea	Baixas (FR)	Gaudière (FR)	Reconductoring of existing 70km double circuit 400kV OHL to increase its capacity.	Congestion is expected on existing asset due to increased exchanges with the Iberian peninsula	The project will result in increased ability to cope with higher exchanges with the Iberian peninsula.	under consideration	2014	
47	CSW CCS North Sea	Tamareau (FR)	Tavel (FR)	Reconductoring with ACCS of both circuits of existing 92km double circuit 400kV OHL to increase its capacity.	Congestion on existing asset due to high East to West power flows between Fos and Rhone Valley generation areas and South Western France; risk of energy not supplied to consumers in the Hérault department.	The project will improve the security of supply of the Hérault department and the ability of the network to accommodate generation in South-Eastern France.	under construction	2010	
48	CSW CCS North Sea	Gaudière (FR)	Rueyres (FR)	Reconductoring limiting sections (10 km) of existing single circuit 400kV OHL to increase its capacity.	Congestion on existing asset limiting existing generation evacuation, especially in the context of high international power flows.	The project is expected to result in reduced annual re-dispatching costs and improved overall capability of the network to accommodate international power exchanges in the area.	design & permitting	2012	

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49	CSW CCS North Sea	Cantegrit (FR)	Mouguerre (FR)	Reconductoring (with ACSS) of existing 83km single-circuit 220kV OHL to increase its capacity.	Congestion on existing asset, especially in the context of high flows to Spain on the Western axis of the France-Spain interconnection, resulting in potential risk of energy not supplied to consumers or NTC limitation.	The project will improve the security of supply of Bayonne area and also the overall capability of the network to accommodate different patterns of power flows on the Eastern and Western axes of the French-Spanish interconnection	design & permitting	2011	
50	CSW CCS North Sea	Néoules (FR)	Broc-Carros (FR)	The second circuit (formerly operated at 220kV) of a 197km double-circuit 400kV OHL will be operated at 400kV and 400/225 autotransformers installed in relevant substations.	Congestion due to thermal capacity of existing assets of Provence - Alps-Côte d'Azur (PACA) Region and voltage control problems, resulting in risks of load-shedding in the region.	The project will improve the security of supply of PACA region	under construction	2010	
51	CSW CCS North Sea	Boutre (FR)	La Bocca (FR)	PACA "Filet de sécurité" project: construction of 3 new 220kV underground cables (Boutre - Trans [72 km], Biançon - Fréjus [26 km] & Biançon - La Bocca [16 km]) and installation of reactive power compensation devices in 220 kV Boutre and Trans substations	Congestion due to thermal capacity of existing assets of Provence - Alps-Côte d'Azur (PACA) Region and voltage control problems, resulting in risks of load-shedding in the region	The project will improve the security of supply of PACA region	design & permitting	2015	
52	CSW CCS North Sea	Feuillane (FR)	Realtor (FR)	Operation at 400 kV of existing 63km double circuit OHL previously operated at 220kV	Limitation to future conventional generation in Fos area.	The project will improve the integration of conventional generation: ability to evacuate up to 1400 MW generation in Fos area	under construction	2011	
53	CSW CCS North Sea	Coulange (FR)	Le Chaffard (FR)	Reconductoring (with ACCS / ACCR) of two existing double circuit 400kV OHL (Coulange - Pivoz-Cordier - Le Chaffard and Coulange - Beaumont-Montoux - Le Chaffard) to increase their capacity. Total length of both lines: 275km	Need to alleviate congestion in the Rhone Valley.	The project is expected to provide annual re-dispatching costs reduction while improving the overall capability of the network to accommodate international power exchanges in the area	design & permitting	2016	
54	CSW CCS North Sea CSE	Cornier (FR)	Pioassasco (IT)	Replacement of conductors (by ACCS) on Albertville (FR) - Montagny (FR) - Cornier (FR) and Albertville (FR) - La Coche (FR) - La Praz (FR) - Villarodin (FR) - Venaus (IT) - Pioassasco (IT) single circuit 400kV OHLs. In addition, change of conductors and operation at 400kV of an existing single circuit OHL between Grande Ile and Albertville (FR) currently operated at lower voltage, and associated works in Albertville (FR) 400kV substation. (Total length of lines : 257 km)	Need to increase cross-border capacity between France and Italy and, on the French side, improve the quality of supply of Savoie.	This upgrade of the existing assets is expected to provide an increase by about 600 MW of FR-IT NTC, improving the security of supply of the system.	under construction	2012	X
55	CSW CCS North Sea CSE	Grande Ile (FR)	Pioassasco (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 500MW capacity). The cables will be laid in the security gallery of the Frejus motorway tunnel and possibly also along the existing motorways' right-of-way.	Need to increase cross-border capacity between France and Italy.	The project will provide an increase of FR-IT NTC by about 1000MW, resulting in higher security of supply for the system.	design & permitting	long term	X

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56	CSW CCS North Sea CSE	Camporosso (IT)		New 450 MVA PST in Camporosso (IT) 220kV substation on Camporosso (IT) - Menton (FR) - Trinité-Victor (FR) OHL.	Need to increase the security of supply in both French Cote d'Azur and Italian Liguria areas.	The project allows to operate the 220kV link closed, which provides improved security of supply of the area and a small increase of NTC between France and Italy.	under construction	2011	X
57	CSW CCS North Sea	under consideration (FR)	under consideration (CH)	Reinforcement of the interconnection in the area of Geneva's lake.	Need to increase cross-border capacity of France with Switzerland and Italy.	The aim is to increase cross-border capacity; improved RES integration is also expected.	under consideration	long term	
58	CCS CCE North Sea Baltic Sea	Ensdorf (DE)	St. Avold (FR)	Change of conductors on the German part of this single circuit 220kV line (9 km) and installation of a phase-shifter in Ensdorf (DE) 220kV substation.	Project will alleviate mainly the need to increase 1) the capability of the grid to accommodate additional generation capacity and 2) the transmission capacity of the grid.	Improved security of supply and small increase of NTC	planned	mid term	
59	CSW CCS North Sea	Moulaine (FR)	Aubange (BE)	Installation of a second circuit on the existing 220kV cross-border OHL	Need to increase the cross border capacity on BE-FR border	The NTC will be increased by 300 MW (winter) / 150 MW (summer).	under construction	2010	X
60	CSW CCS North Sea	under consideration (FR)	under consideration (BE)	to be determined.	Need to increase the cross border capacity on BE-FR border	Increase of NTC.	under consideration	long term	
60a	North Sea	Lillo (BE)	Mercator (BE)	Doubling of the axis Zandvliet-Mercator via Lillo by erecting a new 35km 380kV double circuit OHL with 1500 MVA capacity.	Needed to avoid overloading of the line during certain contingencies as a result of new generation and increasing demand.	Conventional generation integration; improved security of supply; Increase of NTC.	design & permitting	2018	
61	CSW CCS North Sea	Moulaine (FR)	Belval (LU)	Connection of SOTEL (industrial grid in LU) to RTE network by mixed (underground cable & OHL) single circuit 220kV line. Parts of the new line use existing ones.	SOTEL request for connection to RTE grid.	Improved the security of supply of SOTEL's customers connected to Belval substation.	design & permitting	2010	
62	CSW CCS North Sea	under consideration (FR)	under consideration (UK)	New subsea DC link, between GB and FR, possibly with a capacity of 1000MW (still to be determined).	Need for increasing interconnection capacity GB-continent.	Increase of FR-GB NTC by about 1000MW (still to be determined).	under consideration	ca. 2017	
63	CCS	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 100-150km.	Increase cross border capacity between Italy and Austria complying IEM.	The project is expected to improve the security of supply and increase the NTC.	planned	long term	
64	CCS	Bressanone (IT)	New substation near Innsbruck (AT)	New double circuit 400kV interconnection through the pilot tunnel of the planned Brenner Base Tunnel. Total line length: 65km.	Need to increase the cross-border capacity between Italy and Austria.	The project is expected to increase the NTC and Improved the security of supply.	under consideration	2020/2025	x
65	CCS	Curon (IT)/ Glorenza (IT)	New substation close to the border in AT	New 380/220kV substation in AT directly located near the border ; erection of a 24km single circuit 220kV-connection via OHL and underground cable till Graun (IT) and upgrade of the existing line Graun (IT) – Glorenza (IT).	Need to increase the cross-border capacity between Italy and Austria.	The project is expected to increase the NTC and Improved the security of supply.	under consideration	long term	

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66	CCS CSE	Prati di Vize (IT)	Steinach (AT)	Upgrade of the existing 44km Prati di Vize (IT) – Steinach (AT) single circuit 110/132kV OHL, currently operated at medium voltage and installing a 110kV/132kV PST in Steinach (AT).	Need to increase the cross-border capacity between Italy and Austria.	The project is expected to increase the NTC and Improved the security of supply.	design & permitting	short term	
67	CCE CCS CSE	Divaca (SI)		Installation of a new 400kV PST to assist control of power flows to Italy on secure level and secure the operation of Slovenian grid enabling full utilisation of regional market.	The project will provide improved security of supply, increased NTC and reduced re-dispatching costs & grid losses.	Improved security of supply, increase of NTC, annual re-dispatching costs reduction and annual losses reduction.	under construction	short term	X
68	CCE CCS CSE	Okroglo (SI)	Udine (IT)	New 120km double-circuit 400kV OHL with installation of a PST in Okroglo. The thermal rating will be 1500 MVA per circuit.	Need for strengthening the connection between Slovenia and Italy and increasing of power exchange capability.	The project will increase NTC, improved the security of supply and achieve the diversity of supply. The PST in Okroglo substation will secure the operation of Slovenian grid, enabling full utilisation of regional market.	planned	long term	X
69	CCE CCS CSE	Candia (IT)	Konjsko (HR)	New 1000MW HVDC interconnection line between Italy and Croatia via 280km 500kVDC subsea cable and converters stations at both ending points.	Need to increase the cross border capacity between Croatia (and South East Europe in general) and Italy.	The project is expected to increase the NTC and Improved the security of supply.	Under consideration	long term	
70	CCS CSE	Villanova (IT)	Tivat (ME)	New 1000MW HVDC interconnection line between Italy and Montenegro via 375km 500kV DC subsea cable and converter stations at both ending points.	Increase cross border capacity between South East Europe area and Italy complying IEM.	increase of NTC , improved Security of Supply.	design & permitting	2014/2015	X
71	CCS CSE	Brindisi (IT)	Babica (AL)	500MW single pole HVDC Merchant Line between Italy and Albania via 290km 400kV DC subsea cable and converter stations at both ends. On the Italian side, the new line will be connected to the existing substation of Brindisi South.	Need to increase the cross border capacity between South East Europe area and Italy.	The project is expected to increase the NTC and Improved the security of supply.	design & permitting	2013/2014	
72	CCS CSE	Aetos(GR)	Galatina (IT)	Second 500MW HVDC link between Greece and Italy via 316km 400kVDC subsea cable and converters stations at both ends.	Increase cross border capacity between Balkan area and Italy complying IEM.	Increase of NTC and Improved security of supply.	under consideration	2020/2025	
73	CCS	Ei Aouaria (TU)	Partanna (IT)	New 350km 500MW HVDC line between Tunisia and Italy via Sicily with 400kV DC subsea cable and converters stations at both ends.	Need to increase the cross border capacity between Italy and North Africa.	The project is expected to increase the NTC, improved the security of supply and allow for integration of different markets.	design & permitting	2015	
74	CCS CSE	Chiaramonte Gulfi (IT)	Sorgente (IT)	Realization of 380kV ring grid, trough the construction of 3 new 380kV line: "Chiaramonte Gulfi - Ciminna", "Sorgente Ciminna" and "Paternò - Priolo". It will be realized a new 380/150kV substation in Caltanissetta area and the voltage upgrade of the existing Ciminna substation up to 380kV. Total line length: 365km.	Congestion on the existing 220kV Sicily network. Future generation evacuation. Energy transfer from Western to Eastern part of Sicily.	RES integration, annual losses reduction and Improved security of supply.	planned	2015/long term	

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75	CCS CSE	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 ring grid of Sicily.	Need of increasing transport capacity between Sicily and Mainland, improving the security of supply (securing the coverage of energy demand and decreasing the probability of loss of load).	The project will support RES integration (by transmitting wind power from Sicily to mainland), reduce grid losses and Improved the security of supply (by avoiding the risk of Sicily tripping to isolated operation).	under construction	2013	
76	CCS CSE	Partanna (IT)	Ciminna (IT)	New 65km single circuit 400kV OHL in Sicily between existing Partanna and Ciminna substations.	Future generation evacuation.	The project will support RES integration, increase the NTC and reduce the re-dispatching costs.	planned	long term	
77	CCS CSE	Partinico (IT)	Fulgatore (IT)	New 45km single circuit 400kV OHL between Partinico and Fulgatore in Western Sicily.	The project is needed to improve the continuity of service, transmit power from future generation and make possible the interconnection with North Africa. It will also foster the connection of wind power plants foreseen in the area.	The project will support RES integration and reduce grid losses & re-dispatching costs.	planned	2015	
78	CCS CSE	Piana degli Albanesi (IT)		New 220/150kV substation, complying with 400kV standards, connected to the Ciminna substation with a new 400kV line and in & out the existing Bellolampo-Caracoli 400kV line.	Congestion on the 220kV network in the Palermo area.	Improved security of supply and annual losses reduction.	planned	long term	
79	CCS CSE	Agrigento (IT)		New 220/150kV substation, complying with 400kV standards. The new substation will be connected in and out to the existing Partanna-Favara 400kV line .	Congestion on the 150kV network in the Agrigento area.	Improved security of supply and annual losses reduction.	planned	long term	
80	CCS CSE	Noto (IT)		New 220/150kV substation, complying with 400kV standards, connected in and out to the existing Ragusa-Melilli 400kV line.	The project will improve the security of supply and reduce the grid losses.	Improved security of supply and annual losses reduction.	planned	long term	
81	CCS CSE	Trino (IT)	Lacchiarella (IT)	A new 380kV double circuit OHL between the existing 380kV substations of Trino and Lacchiarella in North West Italy area. Total line length: 95km, Voltage upgrade of the existing Magenta 220/132kV substation up to 380kV.	The project is expected to help conventional generation integration, improve the security of supply and reduce grid losses.	Conventional generation integration, improved security of supply and annual losses reduction.	design & permitting	short term	
82	CCS CSE	Chignolo Po (IT)	Maleo (IT)	A new 380kV double circuit OHL between the new 380kV substations of Chignolo Po and Maleo in Lodi area. Restructuring of HV network. Total line length: 22km.	Congestion of the 380kV in north West /north East area due to further increase of generation in Piemonte-Lombardia and the development of the Italian-French interconnection.	Conventional generation integration, improved security of supply and annual losses reduction.	under construction	2012	
83	CCS CSE	Volpago (IT)	North Venezia (IT)	Realization of a new 380kV line between the existing substation of North Venezia and the future 380kV substation of Volpago, connected in and out to the 380kV "Sandrigo - Cordignano" . Total line length: 31km.	Unsatisfactory security and quality of supply in the 380kV grid in the Triveneto area.	Improved security of supply and annual losses reduction.	design & permitting	short term	
84	CCS CSE	Casanova (IT)	Vignole (IT)	Voltage upgrade of the existing 100km Casanova-Vignole 220kV OHL to 400kV and new 400/220/150kV substation in Asti area.	Congestion of the 220kV grid due to further increase of generation in Piemonte and development of the Italian French interconnection.	The project is expected to support conventional generation integration, increase the NTC and reduce grid losses.	planned	2014/long term	

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85	CCS CSE	Voghera (IT)	La Casella (IT)	New 45km double circuit 400kV OHL between the existing substations of La Casella and Voghera.	Congestion of the 380kV in north West /north East area due to further increase of generation in Piemonte-Lombardia and the development of the Italian-French interconnection.	The project is expected to improve security of supply, support conventional generation integration and reduce grid losses.	planned	long term	
86	CCS	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. A PST will be installed on the new 400kV line.	Increase of power exchange capability between south and central south of Italy in order to get over the splitting of the regional market caused by limited transfer capability in both directions.	The project is expected to support conventional generation integration, mitigate CO2 emission, reduce grid losses and help RES integration.	design & permitting	2015	
87	CCS	Feroleto (IT)	Maida (IT)	New 400kV OHL across Calabria between the existing substation of Feroleto and the future substation of Maida, while restructuring the existing grid in North Calabria.	Overcoming the overloads and voltage stability problems limits due to the present production units and the future generation in the area.	Conventional generation integration, CO2 emission mitigation, annual losses reduction and RES Integration.	design & permitting	short term	
88	CCS	Montecorvino (IT)	Benevento (IT)	New 70km double circuit 400kV OHL between the existing 400kV substations of Montecorvino and Benevento II, providing in and out connection to the future substation to be build in Avellino North area, which will be also connected to the existing "Matera-S. Sofia" 400kV line.	Overcoming the overloads and voltage stability problems limits due to the present production units and the future generation in the area.	Conventional generation integration, CO2 emission mitigation, annual losses reduction and RES Integration.	design & permitting	short term	
89	CCS CSE	Fano (IT)	Teramo (IT)	New 200km single circuit 400kV OHL between the existing 400kV substations of Fano and Teramo, providing the connection in and out to the future substation to be built in Macerata area.	Overcoming the congestions between the south and the north market area due to the generation development in the southern Italy.	The project is expected to improve security of supply, support conventional generation integration and reduce grid losses.	planned	2015	
90	CCS	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).	Increase of power exchange capability between north and central north of Italy in order to avoid with the regional market splitting.	The project is expected to support conventional generation integration and reduce grid losses.	design & permitting	short term	
91	CCS	Foggia (IT)	Benevento II (IT)	Upgrade of the existing 85km Foggia-Benevento II 400kV OHL and installation of a PST on this line.	Increase of power exchange capability due to the renewable generation development in Southern Italy.	The project is expected to support RES & conventional generation integration and Improved the security of supply.	design & permitting	short term	
92	CCS	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.	Over coming the constraints in North Eastern area of Italy, especially near Redipuglia 380kV sub station, in case of high import from Slovenia and high production of conventional power plants.	The project is expected to support conventional generation integration, increase the NTC and Improved the security of supply.	design & permitting	short term	
93	CCS	Dolo (IT)	Camin (IT)	New 15km double circuit 400kV OHL between existing Dolo and Camin 400kV substations, to be built in parallel with the existing line.	Overcoming the constraints in the Venezia and Padova area, due to production development in the North East of Italy.	The project is expected to improve the security of supply, support conventional generation integration and reduce grid losses.	design & permitting	short term	

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REF on map	RGs	Substation 1	Substation 2	Project characteristics	Investment need alleviated	Expected benefits	Progress status	Expected time of commissioning	TENE
94	CCS	Sermide (IT)	Carpi (IT)	New 35km 400kV OHL between the existing substations of Sermide and Carpi.	Overcoming the constrains congestion between N and CN market zones, caused by limited transfer.	The project is expected to support conventional generation integration and reduce grid losses.	planned	long term	
95	CCS	Mese (IT)		Voltage upgrade of the existing 220/132kV Mese substation up to 400kV.	Overcoming the constrains in operation, due the renewable generation.	The project is expected to support RES integration and reduce grid losses.	planned	short term	
96	CCS	Deliceto (IT)	Bisaccia (IT)	New 30km single circuit 400kV OHL between the future substations of Deliceto and Bisaccia, in the Candela area.	increase of power exchange capability due to the new renewable generation development in the Southern Italy.	The project is expected to support RES & conventional generation integration and reduce grid losses.	design & permitting	short term	
96a	CCS CSE	Several new substation in south of Italy (IT)		It will be realized a group of new 380/150kV substations. The new substation will be connected to the wind farms in order to avoid the congestions on the 150kV network and dispatch the green energy.	Reduce the congestions on the 150kV network between Puglia, Campania and Calabria.	Improved security of supply and reduction of congestion.	under construction	Mid term	
97	CCS	Polpet (IT)		Voltage upgrade of the existing Polpet 150kV/medium voltage substation up to 220kV, complying with 400kV standards. The substation will be connected by two shorts links to the existing Soverzene-Lienz 220kV line.	Overcoming the constrains in operation, due the renewable generation.	The project is expected to support RES integration and reduce grid losses.	planned	long term	
98	CCS	Pordenone (IT)		Voltage upgrade of the existing Pordenone 220kV substation up to 400kV. The substation will be connected in and out to the existing Udine O. – Cordignano 400kV line.	Ensuring the supply in N and N-1 condition.	The project is expected to reduce grid losses and Improved the security of supply.	planned	long term	
99	CCS	Avise (IT)	Chatillon (IT)	Voltage upgrade of the existing 40km Avise-Villeneuve-Chatillon single circuit 220kV OHL up to 400kV.	Low transfer capacity on the tie-lines "Riddes – Avise" and "Riddes – Valpelline", increase import/export power exchanges.	The project is expected to increase the NTC and reduce grid losses.	design & permitting	short term	
100	CCS	Milan (IT)		Restructuring of the 220kV network in the urban area of Milan. Some new 220kV cables (33km), a new 220kV substation (Musocco) and some reinforcements of existing assets (35km) are planned.	Overcoming the constrains in operation and ensuring the supply in N and N-1 condition in large urban centres.	The project is expected to improve the security of supply and reduce re-dispatching costs & grid losses.	design & permitting	short term	
101	CCS	Turin (IT)		Restructuring of the 220kV network in the urban area of Turin. Some new 220kV cables, some new 220/132kV substations and some reinforcements of existing assets are planned. Total length: 63km.	Need to overcome the congestion in operation and ensure the supply to large urban centres under N and N-1 conditions.	The project is expected to improve the security of supply and reduce grid losses.	design & permitting	2012/long term	
102	CCS	Naples (IT)		Restructuring of the 220kV network in the urban area of Naples. Some new 220kV cables and some reinforcements of existing assets are planned. Total length: 36km.	Need to overcome the congestion in operation and ensure the supply to large urban centres under N and N-1 conditions.	The project is expected to improve the security of supply and reduce re-dispatching costs & grid losses.	design & permitting	long term	
103	CCS	Brescia (IT)		New 400/132kV substation in South East area of Brescia, connected in and out to the existing Flero-Nave 400kVOHL, while restructuring the 132kV network.	Need to overcome the congestion in operation and ensure the supply to large urban centres under N and N-1 conditions.	The project is expected to improve the security of supply and support conventional generation integration.	planned	2015	

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104	CCS	Rome (IT)		Restructuring of the network in the Rome area. The work consists of : a new 380/150kV substation in south-West area of Rome, connected in and out to the existing 380kV line "Rome West-Rome South", a voltage upgrade of the existing Flaminia substation up to 380kV to be connected in and out to the foreseen 380kV line "Rome West - Rome North" and a restructuring of the 150kV network.	Need to overcome the congestion in operation and ensure the supply to large urban centres under N and N-1 conditions.	The project is expected to improve the security of supply and reduce grid losses.	design & permitting	2013/long term	
105	CCS	Treviso (IT)		New 380/132kV substation in Treviso area, connected in and out to the existing 380kV line "Sandrigo - Cordignano".	Need to improve the security of supply under N and N-1 conditions.	The project is expected to improve the security of supply and reduce grid losses.	design & permitting	long term	
106	CCS	Schio (IT)		New 220/132kV substation in Schio area, providing the connection in and out to the existing 220kV line "Ala-Vicenza Monte Viale".	Need to improve the security of supply under N and N-1 conditions and overcome HV grid congestion.	The project is expected to improve the security of supply and reduce grid losses.	planned	short term	
107	CCS	Vicenza Industrial (IT)		New 380/132kV substation in the industrial area of Vicenza, connected in and out to the existing Sandrigo-Dugale 400kV line.	Need to improve the security of supply under N and N-1 conditions.	The project is expected to improve the security of supply and reduce grid losses.	planned	short term	
108	CCS	North West Padova (IT)		New 220/132kV substation in North West Padova area, complying with 400kV standards, providing the connection in and out to the existing Dugale-Marghera Substation1 220kV line.	Need to overcome the congestion in operation (also on HV grid) and ensure the supply to large urban centres under N and N-1 conditions.	The project is expected to improve the security of supply and reduce grid losses.	planned	long term	
109	CCS	North Bologna (IT)		New 400/132kV substation in North Bologna area connected in and out to the existing Sermide-Martignone 400kV line.	Need to improve the security of supply under N and N-1 conditions and overcome HV grid congestion.	The project is expected to improve the security of supply and reduce grid losses.	planned	short term	
110	CCS CCE	East Vesuvius (IT)		New 380/220/150kV substation in East Vesuvius area (near Naples) connected in and out to the existing 380 and 220kV lines "Montecorvino-S. Sofia" and "Nola-S. Valentino".	Need to improve the security of supply under N and N-1 conditions and overcome HV grid congestion.	The project is expected to improve the security of supply and reduce grid losses.	planned	long term	
110a	CCS CSE	Rotonda (IT)	Montecorvino (IT)	Upgrade to 380kV of the 220kV Tuscan-Rotonda line.	Increasing transmission capacity between South and Centre of Italy.	RES integration, conventional generation integration and improved security of supply.	planned	Long term	
111	CCS CSE	Lucca (IT)		New 380/132kV substation in Lucca area connected in and out to the existing 380kV line "La Spezia-Acciaiolio".	Need to improve the security of supply under N and N-1 conditions.	The project is expected to reduce re-dispatching costs and grid losses.	planned	long term	
112	CCS	Tirano (IT)	Verderio(IT)	New 140km single circuit 400kV OHL between Tirano and Verderio substations connecting also the new 400kV substation Grosio/Piateda.	Need to reduce the congestion and increase internal transfer capacity.	The project is expected to support RES integration, and reduce grid losses.	planned	long term	
113	CCS	Monte S. Savino (IT)		New 400/220/132kV substation in Monte S. Savino area connected to the existing S. Barbara 400kV substation by upgrading an existing 220kV line.	Overcoming the congestions caused by the South-North transits.	The project is expected to improve the security of supply and reduce grid losses.	design & permitting	long term	
114	CCS	Ittiri (IT)	Codrongianos (IT)	New 18km 400kV OHL between the existing substation of Codrongianos and the future 400kV substation of Ittiri that will be also connected in and out to the existing Fiumesanto-Selargius 400kV line.	Overcoming congestion in the Northern Sardinia due to the existing power plants and development of the interconnection with Mainland.	The project is expected to support conventional generation integration.	under construction	2011	

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REF on map	RGs	Substation 1	Substation 2	Project characteristics	Investment need alleviated	Expected benefits	Progress status	Expected time of commissioning	TENE
115	CCS	Fiumesanto (IT)	Latina (IT)	Second pole of HVDC link between Sardinia and mainland Italy via 400kV DC subsea cable (420km). The first pole is in operation since 2009. Total capacity of the bipolar link: 1000MW.	Increase of security of Supply in Sardinia island and overcoming the splitting the regional market caused by limited transfer.	The project is expected to support RES integration, reduce re-dispatching costs and Improved the security of supply.	under construction	2010	
116	CCS	Casellina (IT)	Tavarnuzze (IT)	New 37km 400kV OHL with rearrangement of EHV grid in the area between Casellina and S. Barbara. Voltage upgrade of the existing substations of Casellina400/132kV and S. Barbara400/132kV.	Overcoming the congestions caused by the upgrading of S. Barbara Power Plant and the South-North transits.	The project is expected to support conventional generation integration.	under construction	2010	
117	CCS	Castegnero (IT)		New 220/132kV substation connected in and out to the existing 220kV line "Cittadella – Este" and "Dugale – Stazione 1", providing a restructuring of HV grid.	Ensuring the security of supply in N and N-1 condition.	The project is expected to improve the security of supply and reduce grid losses.	under construction	2011	
118	CCS	Porto Ferrario (Elba Island)	Cornia (Piombino)	New 40km 132kV connection via subsea cable between the existing substation of Porto Ferrario and the future 400/132kV substation of Cornia that will also be connected in and out to the existing Suvereto-Piombino Termica 400kV line.	Need to strengthen the connection of Elba Island to mainland.	The project is expected to improve security of supply, reduce annual re-dispatching costs and annual losses.	design & permitting	short term	
119	CCS	Capri, Ischia, Procida (IT)		New 150kV subsea connection between the Capri, Ischia and Procida islands to the existing substations of Cuma and Torre Annunziata (mainland Italy). Total length : 95km.	Need to connect the isolated systems of these islands to mainland.	The project is expected to improve the security of supply, mitigate CO2 emissions and reduce grid losses.	design & permitting	short term	
120	CCS CSE	Lavorgo (CH)	Morbegno (IT)	New 400kV tie line between Italy and Switzerland.	Need to increase cross-border capacity between Italy and Switzerland.	The project is expected to increase NTC.	under consideration	>2020	
121	CCS	Bickigen (CH)	Romanel (CH)	Construction of different new 400kV OHL sections and voltage upgrade of existing 225kV lines into 400kV lines. Total length: 250km.	Need to transmit power from existing and future generation.	The project is expected to support hydro power generation and pump storage integration and Improved the security of supply.	design & permitting	2014	
122	CCS	Chippis (CH)	Lavorgo (CH)	Construction of different new 400kV line sections and voltage upgrade of existing 225kV lines into 400kV. Total length: 120km.	Need to transmit power from existing and future generation.	The project is expected to support hydro power generation and pump storage integration and Improved the security of supply.	design & permitting	2014	
123	CCS	Mettlen (CH)	Ulrichen (CH)	Construction of different new 400kV line sections and voltage upgrade of existing 225kV lines into 400kV lines. Total length: 90km.	Need to transmit power from existing and future generation.	The project is expected to support hydro power generation and pump storage integration and Improved the security of supply.	planned	2015	

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REF on map	RGs	Substation 1	Substation 2	Project characteristics	Investment need alleviated	Expected benefits	Progress status	Expected time of commissioning	TENE
124	CCS	Mettlen (CH)	Airolo (CH)	Upgrade of existing 225kV OHL into 400kV. Line length: 90km.	Need to transmit power from existing and future generation.	The project is expected to support hydro power generation and pump storage integration and Improved the security of supply.	under consideration	2020	
125	CCS	Schwanden (CH)	Limmern (CH)	New 400kV double circuit (OHL and underground cable) between Schwanden and Limmern.	Need to transmit power from future generation and pump storage.	The project is expected to support hydro power generation and pump storage integration and Improved the security of supply.	design & permitting	2015	
126	CCS	Golbia (CH)	Robbia (CH)	New 2x 400kV cable connection between Golbia and the Bernina line double circuit.	Need to transmit power from future generation and pump storage.	The project is expected to support hydro power generation and pump storage integration and Improved the security of supply.	under consideration	2020	
127	CCS	Magadino (CH)	Verzasca (CH)	Upgrade of existing 150kV line into 220kV line.	Need to transmit power from future generation and pump storage.	The project is expected to support hydro power generation and pump storage integration and Improved the security of supply.	under consideration	2020	
128	CCS	Bätiaz (CH)	Nant de Drance (CH)	New 400kV double circuit OHL between Bätiaz and Châtelard. New 2x 400kV cable connection between Châtelard and Nant de Drance. Total length: 22km.	Need to transmit power from future generation and pump storage.	The project is expected to support hydro power generation and pump storage integration and Improved the security of supply.	design & permitting	2014	
129	CCS	Beznau (CH)	Mettlen (CH)	Upgrade of the existing 65km double circuit 220kV OHL to 400kV.	Need to overcome existing bottleneck limiting both import (from France, Germany & Austria) and generation of Beznau power plant.	The project is expected to increase NTC, improved the security of supply and support conventional generation integration.	design & permitting	2015	
130	CCS	La Punt (CH)	Pradella / Ova Spin (CH)	Installation of the second circuit on existing towers of a double-circuit 400kV OHL (50km).	Need to overcome existing bottleneck limiting import from France, Germany and Austria.	The project is expected to increase NTC.	planned	2015	
131	CCS	Bickigen (CH)		Addition of a second 400/220kV transformer in an existing substation.	Need to overcome existing bottleneck limiting both from France, Germany & Austria.	The project is expected to increase NTC and Improved the security of supply.	design & permitting	2012	
132	CCS	Mühleberg (CH)		Construction of a new 400/220kV substation.	Need to overcome existing bottleneck limiting both from France, Germany & Austria.	The project is expected to increase NTC and Improved the security of supply.	design & permitting	2012	
133	CCS	Bonaduz (CH)	Mettlen (CH)	Upgrade of the existing 180km double circuit 220kV OHL into 400kV.	Need to improve the connection between the Alps and the urban area.	The project is expected to improve the security of supply.	under consideration	2020	
134	CCS	Bassecourt (CH)	Romanel (CH)	Construction of different new 400kV line sections and voltage upgrade of existing 225kV lines into 400kV lines. Total length: 140km.	Need to overcome existing bottleneck limiting both from France, Germany & Austria.	The project is expected to increase NTC and Improved the security of supply.	design & permitting	2012	

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REF on map	RGs	Substation 1	Substation 2	Project characteristics	Investment need alleviated	Expected benefits	Progress status	Expected time of commissioning	TENE
135	CCS	220kV nodes (CH)		Many 220kV reinforcement around the urban areas.	Need of better connection of the urban areas.	These projects will improve the security of supply.	planned	2015	
136	CCS CCE North Sea Baltic Sea	Area of Bodensee (DE, AT, CH)		Construction of new lines, extension of existing ones and erection of 400/220/110kV-substation.	This project will increase the current power exchange capacity between the DE, AT and CH.	The project is expected to increase NTC and Improved the security of supply.	planned	long term	
137	CCS CCE North Sea Baltic Sea	Vitkov (CZ)	Mechlenreuth (DE)	New 400kV single circuit tie-line between new (CZ) substation and existing (DE) substation. Length: 70km.	This project will increase the current power exchange capacity between the Czech Republic and Germany.	Increase of NTC.	under consideration	long term	
138	CCS CCE North Sea Baltic Sea	under consideration (CZ)	South-Eastern part of 50Hertz Transmission control area	Possible increase of interconnection capacity between CEPS and 50Hertz Transmission is under consideration: either a new 400kV tie-line (OHL on new route) or a reinforcement of the existing 400kV tie-line Hradec (CEPS) – Röhrsdorf (50Hertz Transmission).	The project will alleviate mainly the need to increase 1) the capability of the grid to accommodate additional generation capacity and 2) the cross-border transmission capacity of the grid.	It is expected that the project will maintain or even Improved the security of supply, and support RES integration and CCE Market development.	under consideration	long term	
139	CCS CCE North Sea Baltic Sea	Vierraden (DE)	Krajnik (PL)	This project is the conversion of existing 220kV double circuit line Krajnik (PSE Operator) - Vierraden (50Hertz Transmission) into a 400kV line together with installation of phase shifting transformers in Krajnik (PSE Operator) and Mikulowa (PSE Operator).	The project will alleviate mainly the need to increase 1) the capability of the grid to accommodate additional generation capacity and 2) the cross-border transmission capacity and flexibility of the grid.	It is expected that the project will decrease the loop flow from DE to PL and to CZ/SK. It will improve the security of supply, increase the power exchange capacity between PL and DE on PL/DE/CZ/SK synchronous profile (i.e. support CCE market development) and support the RES integration.	design & permitting	before 2013	X
140	CCS CCE North Sea Baltic Sea	Eisenhüttenstadt (DE)	Plewiska (PL)	This project is the 3rd 400kV double circuit OHL interconnection between Poland (Plewiska) and Germany (Eisenhüttenstadt) with reinforcement of the Polish internal grid. Total length is 252km, 242km of which being in Poland.	The project will alleviate mainly the need to increase 1) the capability of the grid to accommodate additional generation capacity and 2) the cross-border transmission capacity of the grid.	It is expected that the project will support the CCE market development, RES integration and maintain or even Improved security of supply.	planned	long term	X
141	CCS CCE North Sea Baltic Sea	Ishøj/Bjæverskov (DK)	Bentwisch (DE)	The Kriegers Flak project is the new subsea cable multiterminal connection between Denmark, Sweden and Germany used for both grid connection of offshore wind farms Kriegers Flak and interconnection. Technical features still have to be determined.	The project will alleviate mainly the need of 1) grid connection for new off-shore wind farms in the Baltic Sea and 2) additional cross-border transmission capacity of the grid.	RES integration and increase of NTC.	under consideration	2014	

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142	CCS CCE North Sea Baltic Sea	Tonstad (NO)	tbd (DE)	Nord.Link: A new HVDC connection between Southern Norway and Northern Germany. Estimated subsea cable length: 520 - 600km. Capacity: 700 - 1400MW.	Connecting isolated systems (currently no connection between Germany and Norway).	Increase of NTC (700 - 1400MW), diversity of supply and RES integration.	design & permitting	long term	
143	CCS CCE North Sea Baltic Sea	Kassö (DK) & Ensted (DE)		Installation of two PSTs. This project is in the framework of step 2 in the Danish-German agreement to upgrade the Jutland-DE transfer capacity; This step includes also planned strengthening of existing 380kV lines in the grid of TPS and Energinet.dk .	The project will increase the power exchange capacity between Germany and Denmark Wets. This will improve the market function and contribute to a better utilization of the increasing amount of wind power.	Increase of NTC (Approximately by 500MW when the whole step 2 will be finished), improved security of supply and annual losses reduction.	under construction	mid term	
144	CCS CCE North Sea Baltic Sea	Audorf (DK)	Kassö (DE)	Step 3 in the Danish-German agreement to upgrade the Jutland-DE transfer capacity. It consists of partially an upgrade of existing 400kV line and partially a new 400kV route in Denmark. In Germany new 400kV line mainly in the trace of a existing 220kV line. The total length of this OHL is 114km.	The project will increase the power exchange capacity between Germany and Denmark Wets. This will improve the market function and contribute to a better utilization of the increasing amount of wind power.	This project will enable an Increase of NTC between the two countries, improved security of supply, reduce annual losses.	under consideration	long term	
145	CCS CCE North Sea Baltic Sea	Niederrhein (DE)	Doetinchem (NL)	New 400kV line double circuit DE-NL interconnection line. Length:60km.	Overloads due to high North-South power flows through the auctioned frontier between the Netherlands and Germany in peak hours of wind in feed.	Increase of NTC (1000 - 2000MW), improved security of supply and RES integration.	design & permitting	2013	
146	CCS CCE North Sea Baltic Sea	Aachen/Düren region (DE)	Lixhe (BE)	Connection between Germany and Belgium including new 100km underground cable and extension of existing 380kV substations.	Low cross border capacity.	NTC increase, conventional generation integration and RES integration. The project will facilitate IEM, since presently there is no direct exchange capability between DE and BE.	under consideration	long term	X
147	CCS CCE North Sea Baltic Sea	Dollern (DE)	Hamburg/Nord (DE)	New 400kV double circuit OHL Dollern - Hamburg/Nord including one new 400/230kV transformer in substation Hamburg/Nord and new 400kV switchgear Kummerfeld. Length:43km.	Increase of the transmission capacity from north to south-West Germany due to the increase of RES in Northern Germany.	RES integration, improved security of supply and annual re-dispatching costs reduction.	design & permitting	1. circuit midterm; 2. circuit long-term	X
148	CCS CCE North Sea Baltic Sea	Audorf (DE)	Hamburg/Nord (DE)	New 400kV double circuit OHL Audorf - Hamburg/Nord including two new 400/230kV transformers in substation Audorf. Length: 65km.	Increase of the transmission capacity from north to south-West Germany, due to the increase of RES in Northern Germany and increase of power exchange capability between Denmark and Germany.	RES integration, improved security of supply and annual re-dispatching costs reduction.	planned	long term	X
149	CCS CCE North Sea Baltic Sea	Dollern (DE)	Stade (DE)	New 400kV double circuit OHL Dollern - Stade including new 400kV switchgear in Stade. Length:14km.	Connection of new power plants.	Conventional generation integration.	design & permitting	mid term	
150	CCS CCE North Sea Baltic Sea	Conneforde (DE)	Maade (DE)	New 400kV double circuit (underground cable+OHL) Conneforde - Maade including new 400kV switchgear Maade. Length: 37km.	Connection of new power plants.	Conventional generation integration.	design & permitting	long term	

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REF on map	RGs	Substation 1	Substation 2	Project characteristics	Investment need alleviated	Expected benefits	Progress status	Expected time of commissioning	TENE
151	CCS CCE North Sea Baltic Sea	Wehrendorf (DE)	Ganderkesee (DE)	New line, extension of existing and erection of substations, erection of 380/110kV-transformers.	Increase of the transmission capacity from north to south-West Germany due to the increase of RES in Northern Germany.	RES integration, improved security of supply and annual re-dispatching costs reduction.	design & permitting	mid term	
152	CCS CCE North Sea Baltic Sea	Dörpen/West (DE)		New substation for connection of offshore wind farms.	Connection of off-shore wind farms.	RES integration and conventional generation integration.	design & permitting	mid term	
153	CCS CCE North Sea Baltic Sea	Redwitz (DE)	Grafenrheinfeld (DE)	Upgrade of 230kV connection Redwitz - Grafenrheinfeld to 400kV, including new 400kV switchgear Eltmann. Line length: 97km.	Support of RES integration in Germany, maintaining of security of supply and support of the market development.	RES integration, improved security of supply and conventional generation integration.	design & permitting	mid term	
154	CCS CCE North Sea Baltic Sea	Redwitz (DE)		New 500 MVar SVC in substation Redwitz.	Voltage stability.	Improved security of supply.	planned	mid term	
155	CCS CCE North Sea Baltic Sea	Raitersaich (DE)		New 500 MVar SVC in substation Raitersaich.	Voltage stability.	Improved security of supply.	planned	mid term	
156	CCS CCE North Sea Baltic Sea	Niederrhein (DE)	Dörpen/West (DE)	New 400kV double circuit OHL Dörpen - Niederrhein including extension of existing substations. Length: 167km.	Increase of the transmission capacity from north to south-West Germany due to the increase of RES in Northern Germany.	RES integration, improved security of supply and conventional generation integration.	design & permitting	long term	
157	CCS CCE North Sea Baltic Sea	Wahle (DE)	Mecklar (DE)	New 400kV double circuit OHL Wahle - Mecklar including two new substations. Length: 210km.	Increase of the transmission capacity from north to south-West, due to the increase of RES in Northern Germany.	RES integration, improved security of supply and conventional generation integration.	design & permitting	long term	
158	CCS CCE North Sea Baltic Sea	Irsching (DE)	Ottenhofen (DE)	Upgrade of 230kV connection Irsching - Ottenhofen to 400kV, including new 400kV switchgear Zölling. Length 76km.	Increase of the transmission capacity from north to south due to increase of transits from North to South Germany.	Improved security of supply, RES integration and conventional generation integration.	planned	long term	
159	CCS CCE North Sea Baltic Sea	Cluster BorWin1 (DE)	Diele (DE)	New line consisting of underground +subsea cable with a total length of 205km. Line capacity: 400MW.	Connection of new offshore wind farm.	RES integration.	under construction	mid term	
160	CCS CCE North Sea Baltic Sea	Offshore- Wind park Nordergründe (DE)	Inhausen (DE)	New line consisting of underground +subsea cable with a total length of 35km.	Connection of new offshore wind farm.	RES integration.	design & permitting	mid term	
161	CCS CCE North Sea Baltic Sea	Offshore- Wind park GEOFreE (DE)	Göhl (DE)	New line consisting of underground +subsea cable with a total length of 32km.	Connection of new offshore wind farm.	RES integration.	design & permitting	mid term	

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163	CCS CCE North Sea Baltic Sea	Cluster HelWin1 (DE)	Büttel (DE)	New line consisting of underground +subsea cable with a total length of 145km. Line capacity: aprox. 860MW. This Project includes also a new substation Büttel and connection of this new substation with the existing OHL Brünsbüttel - Wilster.	Connection of new offshore wind farm.	RES integration.	design & permitting	mid term	
164	CCS CCE North Sea Baltic Sea	Cluster SylWin1 (DE)	Büttel (DE)	New line consisting of underground +subsea cable with a total length of 210km. Line capacity: aprox. 690MW.	Connection of new offshore wind farm.	RES integration.	design & permitting	mid term	
165	CCS CCE North Sea Baltic Sea	Cluster DolWin1 (DE)	Dörpen/West (DE)	New line consisting of underground +subsea cable with a total length of 155km. Line capacity: 400MW.	Connection of new offshore wind farm.	RES integration.	design & permitting	mid term	
166	CCS CCE North Sea Baltic Sea	Offshore Wind park Riffgat (DE)	Emden (DE)	New line consisting of underground +subsea cable with a total length of 80km.	Connection of new offshore wind farm.	RES integration.	design & permitting	mid term	
167	CCS CCE North Sea Baltic Sea	Cluster BorWin2 (DE)	Diele (DE)	New line consisting of underground +subsea cable with a total length of 205km. Line capacity: 400-800MW.	Connection of new offshore wind farm.	RES integration.	design & permitting	mid term	
168	CCS CCE North Sea Baltic Sea	Goldshöfe (DE)	Dellmensigen (DE)	Upgrade the line Goldshöfe - Dellmensigen from 220kV to 380kV . Line length:114km. Included with the project : 3x 380kV substations, 2 transformers.	Increase of the transmission capacity from North to South-West of Germany, due to the increase of wind energy in Northern part.	RES Integration, improved security of supply and annual losses reduction.	under construction	2012	
168a	CCS, Baltic Sea, North Sea	Region South-West Bavaria (DE)		Upgrading the existing 220kV OHL to 380kV,length 100km and the extension of existing substations, erection of 380/110kV-transformers.	Upgrading the existing 220 kV OHL to 380 kV, length 100 km and the extension of existing substations, erection of 380/110kV-transformers.	Improved security of supply.	planned	long term	
169	CCS CCE North Sea Baltic Sea	Großgartach (DE)		Upgrade the substation for a higher short circuit capacity. New installation includes 10 gas insulated bays, 63 kA, 3 bus-bar and 2 transformers.	Increase of short-circuit current needs due to the change of the topology for the grid.	Improved security of supply and RES Integration.	under construction	2010	
170	CCS CCE North Sea Baltic Sea	Großgartach (DE)	Hüffenhardt (DE)	New 380kV OHL. Length: 23km. Included with the project : 1 new 380kV substation, 2 transformers.	Increase of the transmission capacity from North to South-West of Germany, due to the increase of wind energy in Northern part.	RES Integration, improved security of supply and annual losses reduction.	under construction	2012	

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171	CCS CCE North Sea Baltic Sea	Hüffenhardt (DE)	Neurott (DE)	Upgrade of the line from 220kV to 380kV. Length: 11km. Included with the project : 1 new 380kV substation.	Adjustment of the transmission capacity of the grid.	Improved security of supply and annual losses reduction.	planned	2020	
172	CCS CCE North Sea Baltic Sea	Mühlhausen (DE)	Großgartach (DE)	Upgrading line from 220kV to 380kV. Length:-45km.	Increase of the transmission capacity from North to South-West of Germany, due to the increase of wind energy in Northern part.	RES Integration, improved security of supply and annual losses reduction.	design & permitting	2014	
173	CCS CCE North Sea Baltic Sea	Hoheneck (DE)	Endersbach (DE)	Upgrading line from 220kV to 380kV. Length:20km.	Increase of the transmission capacity from North to South-West of Germany, due to the increase of wind energy in Northern part.	RES Integration and Improved security of supply.	design & permitting	2014	
174	CCS CCE North Sea Baltic Sea	Bruchsal Kändelweg (DE)	Ubstadt (DE)	A new 380kV OHL. Length:6km.	Adjustment of the transmission capacity of the grid.	Improved security of supply and annual losses reduction.	design & permitting	2014	
175	CCS CCE North Sea Baltic Sea	Birkenfeld (DE)	Ötisheim (DE)	A new 380kV OHL. Length:11km.	Adjustment of the transmission capacity of the grid.	Improved security of supply and annual losses reduction.	planned	2020	
176	CCS CCE North Sea Baltic Sea	Villingen (DE)	Weier (DE)	A new 380kV OHL. Length:75km.	Increase of the transmission capacity from north to south-West of Germany, due to the increase of wind energy in Northern part.	RES Integration and annual re-dispatching costs reduction.	under consideration	2020	
177	CCS CCE North Sea Baltic Sea	Goldshöfe (DE)	Bünzwangen (DE)	A new 380kV OHL. Length: 45km.	Increase of the transmission capacity from North to South-West of Germany, due to the increase of wind energy in Northern part.	RES Integration and annual re-dispatching costs reduction.	under consideration	2020	
178	CCS CCE North Sea Baltic Sea	Baden-Württemberg, Süden & Nordosten (DE)		Installation of 3x250 MVar 380kV capacitance banks.	Injection of reactive power.	Voltage stability.	under construction	2014	
179	CCS CCE North Sea Baltic Sea	Rommerskirchen (DE)	Weißenthurm (DE)	New line, extension of existing and erection of substations, erection of 380/110kV-transformers. Total line length: 100km.	Increase of the transmission capacity from North to South-West of Germany, due to the increase of wind energy in Northern part.	RES integration, improved security of supply and conventional generation integration.	under construction	mid term	
180	CCS CCE North Sea Baltic Sea	Mengede (DE)	Kruckel (DE)	Installation of a second circuit 380kV OHL and extension of existing substations. Line length:16km.	Connection of new power plants.	Conventional generation integration.	planned	mid term	

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181	CCS CCE North Sea Baltic Sea	Dauerberg (DE)	Limburg (DE)	New 380kV double circuit OHL, extension of existing and erection of substations, erection of 380/110kV-transformers. Total line length: 46km.	Increase of the transmission capacity from North to South-West of Germany, due to the increase of wind energy in Northern part.	RES integration and Improved security of supply.	under construction	mid term	
182	CCS CCE North Sea Baltic Sea	Kriftel (DE)	Eschborn (DE)	On the main distance upgrading line, extension of existing substations.	Increase of the transmission capacity from North to South-West of Germany, due to the increase of wind energy in Northern part.	RES Integration and Improved security of supply.	under construction	mid term	
183	CCS CCE North Sea Baltic Sea	Wehrendorf (DE)		Installation of 300 MVar 380kV capacitance banks, extension of existing substations.	Increase of the transmission capacity from North to South-West of Germany, due to the increase of wind energy in Northern part.	Voltage stability and Improved security of supply.	planned	mid term	
184	CCS CCE North Sea Baltic Sea	Bürstadt (DE)		Installation of 2 x 300 MVar 380kV capacitance banks, extension of existing substations.	Increase of the transmission capacity from North to South-West of Germany, due to the increase of wind energy in Northern part.	Voltage stability and Improved security of supply.	planned	mid term	
185	CCS CCE North Sea Baltic Sea	Area of Muensterland and Westfalia (DE)		New lines and installation of additional circuits, extension of existing and erection of several 380/110kV-substations. Total line length: 240km.	Increase of the transmission capacity from North to South-West of Germany, due to the increase of wind energy in Northern part.	RES integration, improved security of supply and conventional generation integration.	planned	long term	
186	CCS CCE North Sea Baltic Sea	Gütersloh (DE)	Bechterdissen (DE)	New lines and installation of additional circuits, extension of existing and erection of 380/110kV-substation. Total line length: 27km.	Increase of the transmission capacity from North to South-West of Germany, due to the increase of wind energy in Northern part.	RES integration and Improved security of supply.	under construction	mid term	
187	CCS CCE North Sea Baltic Sea	Area of West-Rhineland (DE)		New lines and installation of additional circuits, extension of existing and erection of several 380/110kV-substations.	Increase of the transmission capacity from North to South-West of Germany, due to the increase of wind energy in Northern part.	RES integration, improved security of supply and conventional generation integration.	under construction	mid term	
188	CCS CCE North Sea Baltic Sea	Kruckel (DE)	Dauersberg (DE)	New lines, extension of existing and erection of several 380/110kV-substations. Total line length: 130km.	Increase of the transmission capacity from North to South-West of Germany, due to the increase of wind energy in Northern part.	RES integration, improved security of supply and conventional generation integration.	planned	long term	
189	CCS CCE North Sea Baltic Sea	Niederrhein (DE)	Utfort (DE)	New lines and extension of existing 380kV-substations. Total length: 31km.		RES integration, improved security of supply and conventional generation integration.	planned	long term	
190	CCS CCE North Sea Baltic Sea	Saar-Pfalz-Region (DE)		New lines, extension of existing and erection of several 380/110kV-substations.		Improved security of supply and conventional generation integration.	planned	mid term	

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REF on map	RGs	Substation 1	Substation 2	Project characteristics	Investment need alleviated	Expected benefits	Progress status	Expected time of commissioning	TENE
191	CCS CCE North Sea Baltic Sea	Neuenhagen (DE)	Vierraden (DE)	Project of new 380kV double-circuit OHL with 125km length as prerequisite for the planned upgrading of the existing 220kV double-circuit interconnection Krajnik (PL) – Vierraden (DE, 50Hertz Transmission).	Project will alleviate mainly the need to increase 1) the capability of the grid to accommodate additional generation capacity and 2) the transmission capacity of the grid.	In particular the project will support RES integration in North Germany/Poland, maintaining the security of supply and support of market development in CCE.	design & permitting	2011	X
192	CCS CCE North Sea Baltic Sea	Hamburg/Krömmel (DE)	Schwerin (DE)	This 380kV double-circuit OHL project will close the missing gap in North-East German grid infrastructure. Only 65km of new line must be constructed, 22km already exist.	Project will alleviate mainly the need to increase 1) the capability of the grid to accommodate additional generation capacity and 2) the transmission capacity of the grid.	Support of RES integration in North Germany, maintaining of security of supply and support of market development.	under construction	2010	X
193	CCS CCE North Sea Baltic Sea	Halle/Saale (DE)	Schweinfurt (DE)	New 380kV double-circuit OHL between the substations Lauchstädt-Vieselbach-Altenfeld-Redwitz with 215km length combined with upgrade between Redwitz and Grafenheinfeld (see project 153).	Project will alleviate mainly the need to increase 1) the capability of the grid to accommodate additional generation capacity and 2) the transmission capacity of the grid.	Support of RES integration in Germany, annual redispatching cost reduction, maintaining of security of supply and support of the market development.	partly completed; design & permitting	mid term	X
194	CCS CCE North Sea Baltic Sea	wind farm cluster Baltic Sea East (DE)	Lüdershagen/ Lubmin (DE)	Offshore wind farm connection project (by AC-cables on transmission voltage level) has to be constructed and afterwards also to be operated by the TSO (in this project: 50Hertz Transmission) according to German law.	Project will satisfy the need of grid connection for new off-shore wind farms in the Baltic Sea.	Support of RES integration in German part of the Baltic sea.	Under consideration, design & permitting	2011/2015	X
195	CCS CCE North Sea Baltic Sea	wind farm cluster Baltic Sea West (DE)	Bentwisch (DE)	Offshore wind farm connection project (by AC-cables on transmission voltage level) has to be constructed and afterwards also to be operated by the TSO (in this project: 50Hertz Transmission) according to German law. This includes an option for an interconnection project between Germany, Denmark and Sweden via offshore wind farms Kriegers Flak (see project 141).	Project will satisfy the need of grid connection for new off-shore wind farms in the Baltic Sea.	Support of RES integration in German part of the Baltic sea. For optional interconnection part, increase of NTC.	Under consideration, design & permitting	2011/2015	X
196	CCS CCE North Sea Baltic Sea	wind farm Baltic 1 (DE)	Bentwisch (DE)	Offshore wind farm connection of 79km single AC-cable on transmission voltage level has to be constructed and afterwards also to be operated by the TSO (in this project: 50Hertz Transmission) according to German law. There is an extension option for the later grid connection of the offshore wind farm Kriegers Flak 1.	Project will satisfy the need of grid connection for new off-shore wind farms in the Baltic Sea.	Support of RES integration in German part of the Baltic Sea.	under construction	2010	X

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REF on map	RGs	Substation 1	Substation 2	Project characteristics	Investment need alleviated	Expected benefits	Progress status	Expected time of commissioning	TENE
197	CCS CCE North Sea Baltic Sea	Neuenhagen (DE)	Wustermark (DE)	Berlin North Ring: replacement of an existing old 220kV double-circuit OHL by a 380kV double-circuit OHL. Length: 75km.	Project will alleviate mainly the need to increase 1) the capability of the grid to accommodate additional generation capacity and 2) the transmission capacity of the grid.	Support of RES and conventional generation integration in Germany, maintaining of security of supply and support of market development in CCE.	design & permitting	2020	
198	CCS CCE North Sea Baltic Sea	Wuhlheide (DE)	Thyrow (DE)	Berlin South Ring: replacement of an existing old 220kV double-circuit OHL by a 380kV double-circuit OHL. Length: 50km.	Project will alleviate mainly the need to increase 1) the capability of the grid to accommodate additional generation capacity and 2) the transmission capacity of the grid.	Support of RES integration in Germany, maintaining of security of supply and support of market development.	under consideration	long term	
199	CCS CCE North Sea Baltic Sea	Western Pomerania (DE)	Uckermark North (DE)	Construction of new 380kV double-circuit OHLs in North-Eastern part of VE-T control area and decommissioning of existing old 220kV double-circuit OHLs. Length: 135km.	Project will alleviate mainly the need to increase 1) the capability of the grid to accommodate additional generation capacity and 2) the transmission capacity of the grid.	Support of RES and conventional generation integration in North Germany, maintaining of security of supply and support of market development.	planned	2015	
200	CCS CCE North Sea Baltic Sea	Lubmin (DE)	Erfurt area (DE)	New 380kV double-circuit OHL from the Northern part of the 50Hertz Transmission control area to the South-Western part of the 50Hertz Transmission control area with considered further extension to South-Western part of Germany. Length ca. 800km.	Project will alleviate mainly the need to increase 1) the capability of the grid to accommodate additional generation capacity and 2) the transmission capacity of the grid.	Support of RES and conventional generation integration in North Germany, maintaining of security of supply and support of market development.	planned	long term	
201	CCS CCE North Sea Baltic Sea	Bärwalde (DE)	Schmölln (DE)	Upgrade of the existing double-circuit 380kV OHL. Project will be realized earlier than originally planned as part of project 203. Line length: 50km.	Project will alleviate mainly the need to increase 1) the capability of the grid to accommodate additional generation capacity and 2) the transmission capacity of the grid.	Support of RES and conventional generation integration in North Germany, maintaining of security of supply and support of market development.	design & permitting	2013	
202	CCS CCE North Sea Baltic Sea	Reinforcement of the 380kV grid in South-Eastern part of 50Hertz Transmission control area		Upgrading of several existing double-circuit 380kV OHL in the South-Eastern part of the control area of 50Hertz Transmission. Total length: 190km.	Project will alleviate mainly the need to increase 1) the capability of the grid to accommodate additional generation capacity and 2) the transmission capacity of the grid.	Support of RES and conventional generation integration in North Germany, maintaining of security of supply and support of market development.	planned	long term	
203	CCS CCE North Sea Baltic Sea	380kV grid extension in South-Eastern part of 50Hertz Transmission control area (DE)		New 380kV double-circuit OHL in South-Eastern part of 50Hertz Transmission control area. Total length: 105km.	Project will alleviate mainly the need to increase 1) the capability of the grid to accommodate additional generation capacity and 2) the transmission capacity of the grid.	Support of RES and conventional generation integration in North Germany, maintaining of security of supply and support of market development.	under consideration	long term	

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REF on map	RGs	Substation 1	Substation 2	Project characteristics	Investment need alleviated	Expected benefits	Progress status	Expected time of commissioning	TENE
204	CCS CCE North Sea Baltic Sea	Pulgar (DE)	Vieselbach (DE)	Upgrading of the existing double-circuit 380kV OHL . Length:105km.	Project will alleviate mainly the need to increase 1) the capability of the grid to accommodate additional generation capacity and 2) the transmission capacity of the grid.	Support of RES and conventional generation integration in North Germany, maintaining of security of supply and support of market development.	planned	2012	
205	CCS CCE North Sea Baltic Sea	Reinforcement of the 380kV grid in Lausitz area (DE)		Upgrading of several existing double-circuit 380kV OHL in the Eastern part of the control area of 50Hertz Transmission. Total length: 150km.	Project will alleviate mainly the need to increase 1) the capability of the grid to accommodate additional generation capacity and 2) the transmission capacity of the grid.	Support of RES and conventional generation integration in North Germany, maintaining of security of supply and support of market development.	under consideration	long term	
206	CCS CCE North Sea Baltic Sea	380kV grid reinforcement and extension in Saxony (DE)		Upgrade of the existing double-circuit 380kV OHL and also construction of 230km of new 380kV double-circuit OHLs in Saxony (control area of 50Hertz Transmission). Length: 80km.	Project will alleviate mainly the need to increase 1) the capability of the grid to accommodate additional generation capacity and 2) the transmission capacity of the grid.	Support of RES and conventional generation integration in North Germany, maintaining of security of supply and support of market development.	under consideration	long term	
207	CCS CCE North Sea Baltic Sea	Substations in South-Western part of 50Hertz Transmission control area (DE)		Construction of new reactive power compensation devices.	Project will alleviate the need of additional reactive power.	Support of RES and conventional generation integration in North Germany, maintaining of security of supply and support of market development.	planned	2012	
208	CCS CCE North Sea Baltic Sea	Substations in South-Western part of 50Hertz Transmission control area (DE)		Construction of new reactive power compensation devices.	Project will alleviate the need of additional reactive power.	Support of RES and conventional generation integration in North Germany, maintain security of supply and support of market development.	under consideration	long term	
209	CCS CCE North Sea Baltic Sea	Substations in 50Hertz Transmission control area		Construction of new 380kV/110kV substation.	Project will alleviate mainly the need to increase the capability of the grid to accommodate additional generation capacity.	Support of RES integration in Germany and maintain of security of supply.	planned	2012	
210	CCS CCE North Sea Baltic Sea	Substations in 50Hertz Transmission control area		Construction of new 380kV/110kV substation.	Project will alleviate mainly the need to increase the capability of the grid to accommodate additional generation capacity.	Support of RES integration in Germany and maintain of security of supply.	under consideration	long term	
211	CCS CCE North Sea Baltic Sea	Further connections of more offshore wind farms (DE)		Further connections in the clusters BorWin, DolWin, SylWin and HelWin.	Connection of new offshore wind farms.	Increase RES integration.	under consideration	long term	
212	CCS CCE North Sea Baltic Sea	Isar (DE)	St. Peter (AT)	New 400kV double circuit OHL Isar - St. Peter including new 400kV switchgears Altheim, Simbach and St. Peter and one new 400/230kV transformer in substation Altheim. Line length: 90km.	This project will increase the current power exchange capacity between Austria and Germany.	Increase of NTC and RES integration.	under consideration	2017	

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REF on map	RGs	Substation 1	Substation 2	Project characteristics	Investment need alleviated	Expected benefits	Progress status	Expected time of commissioning	TENE
213	CCE CCS CSE	Wien SO (AT)	Szombathely (HU)	Installation of the 2nd circuit on the existing interconnection from Wien SO (AT, APG) to the border (both circuits have already been installed on the Hungarian side, one is connected to Győr and the 2nd circuit to Szombathely). Line length: 63km.	Necessity for further wind integration and connection to the 380kV-grid, increase of transport capacities in the Eastern grid area.	Increase of NTC, RES integration and Improved security of supply.	under construction	2010/2011	
214	CCE CCS CSE	Gabcikovo (SK)	Győr/Szombathely (HU) Sarasdorf/Wien (AT)	SEPS and MAVIR are considering a new interconnection between SK and HU (starting from Gabcikovo substation (SK)) and a connection to the existing 400-kV tie-line Győr/Szombathely (HU) - Vienna/Sarasdorf (AT) at the Hungarian side.	Increase of (n-1)-security and border capacities in this area.	Improved security of supply, increase of NTC and diversity of supply.	under consideration	2020	
215	CCE CCS	St. Peter (AT)	Salzach neu (AT)	New internal double circuit 380kV-line connecting the substations St. Peter and Salzach neu (replacement of the existing 220kV-line). Length: 46km.	Alleviation of North-to-South congestions, creation of strongly needed enhanced North-to-South transmission capacities.	Improved security of supply, annual re-dispatching costs reduction and annual losses reduction.	under construction	2011	X
216	CCE CCS	Salzach neu (AT)	Tauern (AT)	New internal double circuit 380kV-line connecting the substations Salzach neu and Tauern and erection of the new 380/220/110kV-substation Pongau (replacement of the existing 220kV-line). Line length: 115km.	Alleviation of North-to-South congestions, creation of strongly needed enhanced North-to-South transmission capacities.	Improved security of supply, RES integration and annual re-dispatching costs reduction.	planned	2017	X
217	CCE CCS	Dürnrrohr (AT)	Sarasdorf (AT)	Installation of the 3rd and 4th circuit on the existing line Dürnrrohr - Sarasdorf and restructuring in the area of the substation Bisamberg and the 220kV-Weinviertel-line. Total length: 100km.	Increase of (n-1)-security.	Improved security of supply, RES integration and annual losses reduction.	planned	2012/2015	
218	CCE CCS	Obersielach (AT)	Lienz (AT)	The project is concerning new 380kV-lines connecting the substations Lienz (AT) and Obersielach (AT) to close the Austrian 380kV-Ring in the southern grid area. Line length: 190km.	Increase of (n-1)-security and transport capacities in the southern grid area.	Improved security of supply, conventional generation integration and RES integration.	under consideration	2020/2025	
219	CCE CCS	Westtirol (AT)	Zell-Ziller (AT)	Upgrade of the existing 220kV-line Westtirol - Zell-Ziller and erection of additional 220/380kV-Transformers. Line length: 105km.	Increase of (n-1)-security and transport capacities in the Western grid area.	Improved security of supply, conventional generation integration and reduction of infrastructure vulnerability.	under consideration	2012/2020	
220	CCE CCS	Lienz (AT)		Erection of a new 220/220kV- PST in the substation Lienz (AT).	Eliminate congestion management measures and allows the meshed operation of the tie-line Lienz - Soverzene.	Improved security of supply, annual re-dispatching costs reduction and increase of NTC.	design & permitting	2012	
221	CCE CCS	St. Peter (AT)	Ernstshofen (AT)	Upgrade from 220kV-operation to 380kV and erection of a 380kV-Substation in Ernstshofen and St. Peter.	Increase of transport capacities in the East-West direction and necessity for the 380kV-Ring concept.	Improved security of supply, RES integration and conventional generation integration.	planned	2013	
222	CCE CCS	Silz (AT)	Zell-Ziller (AT)	Upgrade of the existing 220kV-double circuit- OHL Zell-Ziller - Silz. Line length: 42km.	Increase of (n-1)-security and transport capacities in the Western grid area.	Improved security of supply, conventional generation integration and reduction of infrastructure vulnerability.	under consideration	2013	

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REF on map	RGs	Substation 1	Substation 2	Project characteristics	Investment need alleviated	Expected benefits	Progress status	Expected time of commissioning	TENE
223	CCE CCS CSE	Cirkovce (SI)	Heviz (HU) Zerjavenc (HR)	The existing substation of Cirkovce (SI) will be connected to one circuit of the existing Heviz (HU) -Zerjavenc (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) - Zerjavenc (HR).	Increasing power exchange and need to improve market integration.	The project will increase NTC, allowing higher power exchange between Slovenia and Hungary, improved security and diversity of supply and secure the operation of the Slovenian system.	design & permitting	short term	X
224	CCE CCS CSE	Krsko (SI)	Bericevo (SI)	New 400kV double circuit OHL. This project will strengthen connection between East and Central part of Slovenia and connect an internal loop. Line length: 80km.	Need to improve the security & quality of supply.	The project should benefit in improved security of supply, grid annual losses & annual re-dispatching costs reduction.	design & permitting	short term	X
225	CCE CCS CSE	Divaca (SI)	Cirkovce (SI)	Upgrading 220kV lines to 400kV in corridor Divaca-Klece-Bericevo-Podlog-Cirkovce. Line length: 193km.	Need to secure the operation of the Slovenian system.	The project is expected to improve the security of supply and reduce annual losses & re-dispatching costs.	planned	long term	
226	CCE CCS CSE	Ernestinovo (HR)	Pecs (HU)	New 400kV double circuit interconnection line between existing stations. Line length: 86km.	Need to increase the cross-border capacity and support market integration.	The project is expected to increase transfer capacity, improved the security of supply and reduce grid losses.	under construction	2010	X
227	CCE CCS CSE	tbd (BA)	tbd (HR)	New 400kV interconnection line between existing stations.	Need to increase the cross-border capacity and support market integration.	The project is expected to improve the security of supply, support conventional generation integration and increase cross-border capacity.	under consideration	tbd	
228	CCE CCS CSE	Trebinje (BA)	Plat (HR)	Re-establishment of previously existing 220kV double circuit interconnection Trebinje(BA)-Plat(HR); Total length 10km.	Need to increase the cross-border capacity and support market integration.	The project is expected to increase the operational security and favour conventional generation integration.	planned	2014	
229	CCE CCS CSE	TPP Plomin (HR)	Melina (HR)	New 90km double circuit OHL, with two connecting substations and a transformer 400/220kV, 400 MVA.	Need to connect a new generator.	The project is expected to favour conventional generation integration and increase the operational security.	under consideration	2016	
230	CCE CCS CSE	TPP Sisak (HR)	Mraclin(HR)/Prijedor(BA)	Connection of new generator on existing line 220kV Mraclin (HR) - Prijedor (BA) via a new double circuit OHL. Line length: 12km.	Need to connect a new generator.	The project is expected to favour conventional generation integration and increase the operational security.	design & permitting	2012	
231	CCE CCS CSE	Konjsko (HR)		Installation of a 150 MVar reactive power device.	Need to control the voltage on the 400kV grid.	The project will improve the security of supply.	planned	2013	
232	CSE	Visegrad (BA)	Pjervlja (ME)	New 400kV transmission line between existing stations. Line length: 70km.	Market integration, need for new DC cable between ME-IT.	Increase of (n-1) security ; New regional corridor ; Increase NTC.	under consideration	>2015	

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233	CSE	Tirana (AL)	Podgorica (ME)	New 400kV line Tirana (AL)-Podgorica (ME) with length 157km (128.5km on Albanian side, 76km of which with double circuit and 28.5km on the Montenegrin side).	Need to strengthen the sparse structure of the South East Europe network and to increase the grid capability to transmit power from countries with surplus generation (BG, RO) towards Italy.	The project is expected to increase NTC and Improved the security of supply.	under construction	2010	
233a	Cont.SE	Tivat (ME)		A new substation will be connected to the existing line 400kV Podgorica(ME)-Trebinje(BA), with two transformers 2X300MVA 400/110kV, and convertor station for the DC cable Tivat-Villanova (see 70).	market integration. Operation of Montenegrin grid to be improved	RES integration, market integration, increase of NTC.	design & permitting	2014/2015	
233b	Cont.SE	Tivat (ME)	Pļevlja (ME)	New transmission line connecting existing substation Pļevlja and new substation Tivat. It is part of the new interconnection project ME/IT	market integration, need for new DC cable between ME-IT. N-1 security	Improved security of supply, market integration (creation of new interface between countries).	design & permitting	2016	
234	CSE	Elbasan (AL)	Tirana(AL)	New 400kV AC OHL. Length: 48km.	Need to strengthen the sparse structure of the South East Europe network and to increase the grid capability to transmit power from countries with surplus generation (BG, RO) towards Italy.	The project is expected to increase NTC and Improved the security of supply.	under construction	2010	
235	CSE	Tirana(AL)	Pristina(RS)	New 238km 400kV OHL; on 78km the circuit will be installed on the same towers as the Tirana-Podgorica OHL currently in construction (see project 233); the rest will be built as single circuit line.	Need to strengthen the sparse structure of the South East Europe network and to increase the grid capability to transmit power from countries with surplus generation (BG, RO) towards Italy.	The project is expected to increase NTC and Improved the security of supply.	under consideration	tbd	
236	CSE	Nis (RS)	Stip (MK)	New 220km 400kV single circuit overhead interconnection between Serbia and FYROM. A new 400/110 substation will be built in Serbia between connection nodes.	Low NTC value between Romania, Serbia and Bulgaria from one side and Greece, Albania and FYROM from other side. Improvement of voltage profile in South Serbia.	The project will increase of NTC and Improved the operational safety & the quality of supply in both countries.	Under construction in RS and design & permitting in MK	2011/2013	X
237	CSE	TPP Kosovo (RS)	Skopje (MK)	A new 400kV OHL relevant to planning investment of 2000MW of TPP in the area of Kosovo and Metohija. Line length: 85km.	Project will alleviate mainly the need to increase 1) the capability of the grid to accommodate additional generation capacity and 2) the transmission capacity of the grid.	The project is expected to favour conventional generation integration and increase the NTC.	under consideration	long term	
238	CSE CCE	Pancevo (RS)	Resita (RO)	New 150km double circuit (single wired at the beginning) 400kV OHL between existing substations.	Need to alleviate the congestion limiting export from Eastern to Western part of South Eastern Europe. Foreseen wind farms in Serbia and Romania need also to be accommodated.	The project will provide an increase of NTC and favour RES integration.	design & permitting	2015	

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REF on map	RGs	Substation 1	Substation 2	Project characteristics	Investment need alleviated	Expected benefits	Progress status	Expected time of commissioning	TENE
239	CSE	Bitola (MK)	Elbasan (AL)	New 200km cross-border single circuit 400kV OHL between existing substations.	Need to strengthen the sparse structure of the South East Europe network and to increase the grid capability to transmit power from countries with surplus generation (BG, RO) towards Italy.	In combination with the recently commissioned 400kV link MK-BG, this project is part of the East-West corridor in South-Eastern Europe. The project will increase the NTC and favour conventional generation integration.	under consideration	long term	
240	CSE	Patras (GR)	400kV Continental System (GR)	New 400kV substation in Patras (GIS Technology) and in&out connection to the existing Axeloos - Distomo 400kV OHL via a new 15km double circuit line, part of which will consist of subsea cable. The project shall constitute the first 400kV corridor to Peloponnese.	Future generation evacuation and demand growth.	The project will improve the security of supply, favour conventional generation &RES integration.	design & permitting	2013	X
241	CSE	Patras (GR)	Megalopolis (GR)	New 400kV substation in Megalopolis and connection to Patras 400kV substation via a 110km double circuit OHL. 2nd corridor to Peloponnese.	Future generation evacuation and demand growth.	The project will improve the security of supply, favour conventional generation &RES integration.	design & permitting	2013	X
242	CSE	Megalopolis (GR)	Korinthos (GR)	Construction of a new 400kV substation in Korinthos (GIS Technology) and connection to the Megalopolis substation via a 110km double circuit 400kV OHL.	Future generation evacuation and demand growth.	The project will improve the security of supply, favour conventional generation &RES integration.	design & permitting	2014	X
243	CSE	Korinthos (GR)	Koymoyndoyros (GR)	Replacement of the existing 150kV double circuit line by a 87km double circuit 400kV OHL.	Future generation evacuation and demand growth.	The project will improve the security of supply, favour conventional generation &RES integration.	design & permitting	2014	X
244	CSE	Filippi (GR)	Lagadas (GR)	New 400kV substation in Lagadas in Thessaloniki area and connection to the existing substation of Filippi via a new 110km double circuit 400kV OHL.	Market integration, future RES and conventional generation evacuation and improvement of security of supply.	The project will improve the security of supply, favour conventional generation & RES integration.	design & permitting	2012	
245	CSE	N.Santa (GR)		Construction of the new 400kV S/S N.Santa in North Greece. This S/S will serve as the interface for the new line GR-TR, as well as for the interconnection of new wind farms and conventional generation.	Market integration, future RES and conventional generation evacuation and improvement of security of supply. Future interconnection with Turkey.	Increase of NTC, conventional generation integration and RES integration.	under construction	2012	
246	CSE	Aliveri (GR)	System (GR)	Construction of the new 400kV S/S Aliveri in Eviai area and a new 400kV double circuit line Aliveri-System. Line length: 72km.	Future RES and conventional generation evacuation.	Improved security of supply, conventional generation integration and RES integration.	design & permitting	2011	
247	CSE	Aliveri (GR)	Larimna (GR)	Construction of the new 400kV S/S Aliveri in Eviai area and a new 400kV double circuit line Aliveri-System. Line length: 128km.	Future RES and conventional generation evacuation.	Improved security of supply, conventional generation integration and RES integration.	design & permitting	2014	
248	CSE	Polypotamo (GR)	N. Makri (GR)	New 150kV double circuit subsea cable. Line length: 33km.	Radial connection of wind farms.	RES integration.	under construction	2011	

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249	CSE	Polypotamo (GR)	N. Evia (GR)	New 150kV double circuit OHL. Line length: 40km. Along the new transmission line, 4 new 150/20kV substation shall be build for the interconnection of new wind farms in Evia island.	Radial connection of wind farms.	RES integration.	design & permitting	2010	
250	CSE	Lavrion (GR)	Syros (GR)	New 150kV subsea cable DC connection. There is also the possibility to use AC if proved technically and economically feasible.	Connection of isolated systems and future RES integration.	Improved security of supply and reduce energy costs.	design & permitting	long term	X
251	CSE	Syros (GR)	Cyclades (GR)	New 150kV subsea cables and 4x150kV Substations to islands of Paros, Naxos, Mykonos, Evia.	Connection of isolated systems and future RES integration.	Improved security of supply.	design & permitting	long term	X
252	CSE	Mellitii (GR)	Kardia (GR)	New 400kV double circuit OHL. Length:40km.	Improve security of supply, strengthen of North to South corridor.	Increase of security of supply and market integration.	design & permitting	2013	
253	CSE	Kardia (GR)	Trikala (GR)	New 400kV double circuit OHL. Length:80km.	Improve security of supply, strengthen of North to South corridor.	Increase of security of supply and market integration.	design & permitting	long term	
254	CSE	Larissa(GR)	Trikala (GR)	New 400kV double circuit OHL. Length:57km.	Market integration.	Increase of export capabilities to Italy.	under consideration	long term	
255	CSE	Lamia (GR)		Construction of a new 400kV EHV SS in Lamia and connection to the two circuits of the existing 400kV lines Trikala-Distomo and Larisa-Larymna.	Demand growth and equipment enhancement.	Improved security of supply.	planned	long term	
256	CSE	Maritas East 1 (BG)	N.Santa (GR)	New interconnection line BG-GR by a 130km single circuit 400kV OHL.	Increase of NTC, future generation evacuation and stability enhancement of the future interconnection with Turkey.	Increase the security of the interconnection of BG, GR,TR, help reduce annual losses reduction and increase the transfer limit between GR and BG and BG and Turkey.	under consideration	2012/2015	
257	CSE	Maritas East 1 (BG)	Plovdiv (BG)	New 93km single circuit 400kV OHL in parallel to the existing one.	Need to connect new 2x300MW generators in M.East1.	This project aims to provide a secure connection of the new generators in M.East, increase the transfer limit between GR and BG and BG and Turkey and increase the security of the interconnection of BG, GR,TR.	planned	2013	
258	CSE	Maritas East 1 (BG)	Maritas East 3 (BG)	New 13km single circuit 400kV OHL in parallel to the existing one.	Need to connect new 2x300MW generators in M.East1.	This project aims to provide a secure connection of the new generators in M.East, increase the transfer limit between GR and BG and BG and Turkey and increase the security of the interconnection of BG, GR,TR.	planned	2012	
259	CSE	Plovdiv (BG)	Zlatica (BG)	New 75km single circuit 400kV OHL.	Need to supply the growing demand of the area.	This project aims to increase the security of the Plovdiv region and the Bulgarian system in general.	under construction	2010	

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REF on map	RGs	Substation 1	Substation 2	Project characteristics	Investment need alleviated	Expected benefits	Progress status	Expected time of commissioning	TENE
260	CSE	Plovdiv (BG)	Aleko(BG)	Reconstruction of the existing 220kV OHL and the building of a new second one. Line length: 40km.	For some regimes this line gets overloaded. Main bottleneck of Turkey TTC.	Eliminate the bottleneck, increase the thermal limit from 228 MVA to 720 MVA, increase the security of the Plovdiv region and TTC of Turkey .	planned	2012	
261	CSE	Karnobat (BG)	Dobrudja (BG)	This project concerns the reconstruction of the existing 220kV OHL. Line length: 95km.	Demand growth. A very important connection between South East generation region and Middle East region - with a big consumption.	Increase the security of the system.	planned	2013	
262	CSE	Maritas East 1 (BG)	Burgas (BG)	New 400kV OHL. Line length: 135km.	Increase the security of supply of the Burgas region in the maintenance period.	Increase the security of supply of the Burgas region in the maintenance period, increase the transfer limit between GR and BG and BG and Turkey and increase the security of the interconnection of BG, GR,TR.	planned	mid term	
263	CSE	Krushari (BG)		New 400/110kV substation to accommodate RES generation.	RES penetration.	Wind generation integration.	planned	2020	
264	CSE	Vidno (BG)		New 400/110kV substation to accommodate RES generation.	RES penetration.	Wind generation integration.	planned	2020	
265	CSE	Vidno (BG)	Krushari (BG)	New 400kV double circuit OHL to accommodate RES generation. Line length: 2x115km.	RES penetration.	Wind generation integration.	planned	2020	
266	CSE	Existing interconnection 400kV line Varna (BG) - Issacea (RO)	Krushari (BG)	New 400kV double circuit OHL to accommodate RES generation. Line length: 2x10km.	RES penetration.	Wind generation integration.	planned	2020	
267	CCE CSE	Suceava (RO)	Baltic (MO)	New 400kV transmission line between existing station in Romania and new substation in Moldavia. Line length: 145km.	Market integration. Creating export opportunities from Ukraine to ENTSO-E countries.	Increase of NTC.	planned	>2020	
268	CCE CSE	Constanta (RO)	Pasakoy (TR)	New DC link (subsea cable) between existing stations in RO and TR. Line length: 400km.	Market integration.	Market.	design & permitting	2020	
269	CCE CSE	Portile de Fier (RO)	Resita (RO)	New 400kV OHL between existing stations. Line length: 121km.	Need to strengthen the grid between West and Central of Romania.	Increase of NTC and RES integration.	design & permitting	2015	
270	CCE CSE	Resita(RO)	Timisoara-Sacalaz-Arad (RO)	Upgrade of an existing 220kV single circuit line to 400kV. Line length: 128km.	Need to strengthen the grid between West and Central of Romania.	Increase of NTC and RES integration.	design & permitting	2019	
271	CCE CSE	IN-OUT in Medgidia on actual 400kV OHL Isaccea-Varna (RO)		New400kV double circuit OHL between existing stations. Line length: 13km.	Need to expand the network for access by new generator.	Conventional generation and RES integration.	design & permitting	2015	

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272	CCE CSE	IN-OUT in Medgidia on actual 400kV OHL Isaccea-Dobrudja (RO)		New 400kV double circuit OHL between existing stations. Line length: 10km.	Need to expand the network for access by new generator.	Conventional generation and RES integration.	design & permitting	2014	
273	CCE CSE	Cernavoda (RO)	Stalpu (one line in-out G.Ialomitei - RO)	New 400kV double circuit OHL between existing stations. Line length:171km.	Need to expand the network for access by new generator.	Conventional generation and RES integration.	design & permitting	2017	
274	CCE CSE	Constanta (RO)	Medgidia(RO)	New 400kV double circuit (one circuit wired) OHL between existing stations. Line length:171km.	Market integration.	Increase of NTC, RES integration and increase security of supply.	design & permitting	2016	
275	CCE CSE	Smardan(RO)	Gutinas(RO)	New 400kV double circuit OHL between existing stations. Line length:140km.	Need to expand the network for access by new generator.	Conventional generation and RES integration.	design & permitting	2016	
276	CCE CSE	Suceava(RO)	Gadalin(RO)	New 400kV OHL between existing stations. Line length: 260km.	Need to strengthen the grid between East and West of Romania.	Increase of NTC and RES integration.	planned	2019	
277	CCE CSE	Heviz (HU)	Szombathely (HU)	New 400kV transmission line between existing stations. Line length: 78km.	In transmission outage situation the underlying distribution network is at risk of overload.	Increased operational security.	under construction	2009	
278	CCE CSE	Gyor / Liter (HU)	Gonyu (HU)	New substation Gonyu (generator connection point) is connected by splitting and extending existing line Gyor-Liter.	Need to expand the network for access by new generator.	Conventional generation integration.	under construction	2010	
279	CCE CSE	Gyor (HU)	Martonvasar (HU)	Upgrade of an existing 220kV single circuit line to 400kV double circuit. Line length:84km.	Need to strengthen the grid between Northwest and Central Hungary.	Increased operational security.	design & permitting	2012	
280	CCE CSE	Gyor / Martonvasar (HU)	Bicske (HU)	New substation Bicske with 2*250 MVA 400/120kV transformation is connected by splitting and extending existing line Gyor-Martonvasar line.	Need to increase transformation capacity towards distribution.	Increased security of supply.	design & permitting	2012	
281	CCE CSE	Albertirsa (HU)	Martonvasar (HU)	Adding second circuit to existing 400kV single circuit OHL. Line length: 45km.	Need to improve coupling between North -East and North - West Hungary 400kV grid areas.	Increased operational security.	design & permitting	2012	
282	CCE CSE	Sajozsoged / God (HU)	Detk (HU)	New substation Detk with 2*250 MVA 400/120kV transformation is connected by splitting and extending existing line Sajozsoged-God.	High 220/120kV transformer's lose. Improve N-1 security. Connection point is needed for new generator.	Increased operational security and conventional generation integration.	design & permitting	2012	
283	CCE CSE	Albertirsa / Bekescsaba (HU)	Szolnok (HU)	New substation Szolnok with 2*250 MVA 400/120kV transformers is connected by splitting and extending existing line Albertirsa-Bekescsaba.	High 220/120kV transformers lose, improve N-1 security of supply.	Increased operational security.	design & permitting	2012	
284	CCE CSE	Martonvasar / Paks (HU)	Dunaujvaros (HU)	New substation Dunaujvaros with 2*250 MVA 400/120kV transformation is connected by splitting and extending existing line Martonvasar-Paks.	High 220/120kV transformers lose, improve N-1 security of supply.	Increased operational security.	design & permitting	2012	

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285	CCE CSE	Debrecen (HU)		New substation Debrecen with 2*250 MVA 400/120kV transformation is connected by changing the operating voltage of line Sajozoged-Debrecen from 220kV to 400kV, this line being already designed for 400kV.	High 220/120kV transformers lose, improve N-1 security of supply.	Increased operational security.	planned	2013	
286	CCE CSE	Martonvasar / Liter (HU)	Szekesfehervar (HU)	New substation Szekesfehervar with 2*250 MVA 400/120kV transformation is connected by splitting and extending existing line Martonvasar-Liter.	Need to increase transformation capacity towards distribution.	Increased operational security.	planned	2014	
287	CCE CSE	Albertirsa / God (HU)	Godollo (HU)	New substation Godollo with 2*250 MVA 400/120kV transformation is connected by splitting and extending existing line Albertirsa-God.	Need to increase transformation capacity towards distribution.	Increased operational security.	planned	2015	
288	CCE CSE	Albertirsa / Martonvasar (HU)	Szazhalombatta (HU)	New substation Szazhalombatta is connected by splitting and extending existing line Albertirsa-Martonvasar.	Need to expand the network for access by new generator.	Conventional generation integration.	planned	2015	
289	CCE CSE	Felsozsolca (HU)	Sajoivanka (HU)	Reconstruction of line to double circuit, installation of the 2nd transformer in substation Sajoivanka. Line length: 29km.	Need to increase transformation capacity towards distribution.	Increased operational security.	under consideration	2015	
290	CCE CSE	Oroszlany (HU)		New substation Oroszlany with 2*250 MVA 400/120kV transformation is connected by splitting and extending the second circuit of line Martonvasar-Gyor.	Need to build new transformer station as old 220/120kV station will be dismantled.	Increased operational security.	under consideration	2017	
291	CCE CSE	Sajozoged (HU)		New 400/120kV 250MVA transformer with PST.	High 220/120kV transformers lose, improve N-1 security of supply.	Increased operational security.	under consideration	2017	
292	CCE CSE	Debrecen (HU)		Reconstruction of 750kV substation.	750kV equipment in station Albertirsa reach end of life in 2012, alternative location is considered for improved cost-benefit.	Reduced operating cost.	under consideration	2013	
293	CCE	Voľa (SK)	point of splitting (SK)	Splitting of the existing single 400kV line between Lemešany and Veľké Kapušany substations to connect the new 400kV substation Voľa with transformation 400/110kV (replacing existing 220kV substation). New 400kV double circuit OHL. Length: 23km.	Request of relevant DSO on future demand growth in next 4 years. New generation units are expected in the future in this area as well.	Improved security of supply and secure and reliable power output evacuation.	design & permitting	2013	
294	CCE	Lemešany (SK)	Veľké Kapušany (SK)	Restoration of the old 400kV line between Lemešany and Veľké Kapušany substations by installing a second circuit. Line length: 74km.	Ensuring of electricity evacuation from new perspective power plant, reinforcement of eastern part of Slovak power system.	Improved security of supply and secure and reliable power output evacuation.	planned	2018	X

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295	CCE	Lemešany (SK)	Moldava (SK)	New 31km double circuit 400kV line, replacing a 220 kV one. The part of the line from Moldava substation up to switching substation Košice was put into operation in 10/2009.	Ensure electricity supply to an important transmission system consumer, now via Košice (400kV) and no more via Lemešany (220kV). Reinforce the Eastern part of the Slovak power system in north-south direction.	Improved security of supply.	under construction	2011	
296	CCE	Medzibrod (SK)	point of splitting (SK)	Connection of existing 220/110kV Medzibrod substation to the 400kV system by splitting the single 400kV line Sučany - Liptovská Mara. Project includes also the reconstruction of Medzibrod substation from 220kV level to 400kV including transformation 400/110kV. Line length:36km.	Need to enhance electricity supply to Medzibrod nodal area and for an important consumer which is at the same time a significant employer in the concerned region.	Improved security of supply.	design & permitting	2013	
297	CCE	Križovany (SK)	Horná Ždaňa (SK)	The new substation Bystričany with transformation 400/110kV will be connected to the 400kV system by two new 2x400kV lines from Horná Ždaňa and Križovany substations by splitting only one circuit in Bystričany substation. In the future the substation will be also equipped with a 220kV switchgear. Line length:112km.	The project is linked to the decommissioning of NPP Jaslovské Bohunice V1. Beyond that, there is a need to enhance power withdrawal from new potential generation units, and ensure electricity supply to the industrial area.	Secure and reliable power output evacuation, improved security of supply and internal power system reinforcement.	Planned	2020	
298	CCE	Veľký Ďur (SK)	Gabčíkovo (SK)	Erection of new 2x400kV line between two important substations and erection of new switching station Gabčíkovo next to the existing one. Line length:93km.	Need to enhance power withdrawal from new potential generation units in Western Slovakia.	Secure and reliable power output evacuation and Improved security of supply. There are new generation units expected in concerned area, therefore the effect of this line is expected in this way. The project might improve exchange capacity on the Slovak - Hungarian profile.	Planned	2020	
299	CCE	Krasikov (CZ)	Horní Životice (CZ)	New single circuit 400kV OHL, 1385 MVA.	Need to strengthen the grid in the direction North-south of the system.	Improved operational security ; reduction of infrastructure vulnerability.	design & permitting	2014	
300	CCE	Chotejovice (CZ)		New 400/110kV substation equipped with transformers 2x350MVA .	Connection point of a new power unit 660MW.	Conventional generation integration ; reduction of infrastructure vulnerability.	design & permitting	2011	
301	CCE	Vyskov (CZ)	Chotejovice (CZ)	New single circuit 400kV OHL; 1385 MVA.	Connection of new 400kV substation (Chotejovice) into the rest of the network system.	Conventional generation integration.	design & permitting	2011	
302	CCE	Vyskov (CZ)	Cechy stred (CZ)	New second circuit 400kV OHL; 1385 MVA.	Need to strengthen the grid in the central part of CZ through doubling the OHL line. Facilitate flow from West to East.	Enhancing security of supply of CZ grid.	planned	2015	
303	CCE	Babylon (CZ)	Bezdecin (CZ)	New second circuit 400kV OHL; 1385 MVA.	Need to facilitate flow from West to East and enhance security of supply; Facilitate flow from West to East.	Improved security of supply.	planned	2016	
304	CCE	Babylon (CZ)	Vyskov (CZ)	New second circuit 400kV OHL; 1385 MVA.	Need to facilitate flow from West to East and enhance security of supply. Facilitate flow from West to East.	Improved security of supply.	planned	2018	
305	CCE	Kletne (CZ)		New 400/110kV substation equipped with transformers 2x350MVA .	Need to increase transformation capacity to distribution.	Reduction of infrastructure vulnerability.	design & permitting	2011	

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306	CCE	Vitkov (CZ)		New 400/110kV substation equipped with transformers 2x350MVA.	Need to facilitate connection of RES power generation from 110kV to 400kV, new 400kV interconnection node to DE.	RES integration.	planned	2015	
307	CCE	Vernerov (CZ)		New 400/110kV substation equipped with transformers 2x350MVA.	Need to facilitate connection of RES power generation from 110kV to 400kV, new 400kV connection node to rest of the network.	RES integration ; reduction of infrastructure vulnerability.	planned	>2015	
308	CCE	Vernerov (CZ)	Vitkov (CZ)	New 400kV double circuit OHL, 1385 MVA.	Need to facilitate connection of RES in CZ and enhance security of supply; facilitate flow between CZ and DE.	RES integration ; improved security of supply.	under consideration	>2015	
309	CCE	Vitkov (CZ)	Prestice (CZ)	New 400kV double circuit OHL, 1385 MVA.	Need to facilitate connection of RES in CZ and enhance security of supply. Facilitate flow between CZ and DE.	RES integration ; improved security of supply.	planned	2020	
310	CCE	Vyskov (CZ)	Reporyje (CZ)	New connection between 2 existing substations line single circuit OHL 1385 MVA.	Need to strengthen the grid in the central part of CZ and enhance security of supply.	Improved security of supply.	under consideration	>2015	
311	CCE	Kocin (CZ)		Upgrade of the existing substation 400/110kV; upgrade transformers 2x350MVA.	Future generation evacuation, prevention of high short - circuit current.	Conventional generation integration ; reduction of infrastructure vulnerability.	planned	2015/2020	
312	CCE	Mirovka (CZ)		Upgrade of the existing substation 400/110kV with two transformers 2x250MVA.	Future generation evacuation.	Conventional generation integration ; reduction of infrastructure vulnerability.	planned	2017/2018	
313	CCE	Kocin (CZ)	Mirovka (CZ)	Connection of 2 existing 400kV substations with double circuit OHL having 120.5km length: and a capacity of 2X1385 MVA.	Future generation evacuation.	Conventional generation integration ; reduction of infrastructure vulnerability.	planned	2017/2018	
314	CCE	Mirovka (CZ)	V413 (CZ)	New double circuit OHL with a capacity of 2x1385 MVA and 26.5km length.	Need to strengthen the grid. Facilitate flow from West to East.	Enhancing security of supply of CZ grid.	planned	2018/2019	
315	CCE	Kocin (CZ)	Prestice (CZ)	Adding second circuit to existing single circuit line OHL upgrade in length of 115.8km. Target capacity 2x1385 MVA.	Need to strengthen the grid.	Enhancing security of supply of CZ grid.	planned	2019/2021	
316	CCE	Mirovka (CZ)	Cebin (CZ)	Adding second circuit to existing single circuit line (88.5km, 2x1385 MVA).	Need to strengthen the grid.	Enhancing security of supply of CZ grid.	planned	2019/2021	
317	CCE	Hradec (CZ)	Reporyje (CZ)	Upgrade of existing 400kV single circuit OHL with length of 116.9km. Target capacity 1385 MVA.	Need to facilitate flow from West to East and enhance security of supply.	Enhancing security of supply of CZ grid; RES integration.	design & permitting	2014	
319	CCE Baltic Sea	Skawina (PL)		A new AC 400/110kV substation next to existing 220/110kV substation in Cracow Agglomeration Area with transformation 400/110kV 2x400 MVA. New substation Skawina is connected by splitting and extending of existing 400kV lines Tarnów - Tucznawa and Rzeszów - Tucznawa. Dismantling of existing 220/110kV transformers.	Connection to the network of power plants.	Conventional generation integration ; improved security of supply.	design & permitting	2015	

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REF on map	RGs	Substation 1	Substation 2	Project characteristics	Investment need alleviated	Expected benefits	Progress status	Expected time of commissioning	TENE
320	CCE Baltic Sea	Dargoleza (PL)		A new AC 400/110kV (400 MVA) substation between existing substations Słupsk and Żarnowiec in Northern Poland. New substation Dargoleza is connected by splitting and extending of existing 400kV line Słupsk - Dargoleza.	Connection to the network of RES.	RES integration ; improved security of supply.	planned	2015	
321	CCE Baltic Sea	Kromolice (PL)	Pątnów (PL)	New 79km 400kV 1870 MVA OHL interconnection line Kromolice - Pątnów - with one circuit from Plewiska to Koninn temporarily on 220kV after dismantling of 220kV line Plewiska - Konin.	Power output from generating units connected to the transmission network.	Conventional generation integration ; improved security of supply.	under construction	2015	X
322	CCE Baltic Sea	Kromolice (PL)		A new AC substation between existing substations Plewiska and Ostrów and Pątnów in Poznań Agglomeration Area with transformation 400/110kV 400 MVA. New substation Kromolice is connected by splitting and extending existing line Ostrów-Plewiska and Pątnów - Plewiska.	Safe operation of the system - increase of the power demand.	Improved security of supply ; increased of NTC.	under construction	2015	
323	CCE Baltic Sea	Warszawa Siekierki (PL)	Piaseczno (PL)	A new AC 220/110kV substation (with transformation 220/110kV 2x275MVA) in Warsaw Agglomeration Area connected by a new 20km 220kV 333 MVA cable/OHL line Warszawa Siekierki - Piaseczno.	Power output from generating units connected to the transmission network.	Conventional generation integration ; improved security of supply.	design & permitting	2015	
324	CCE Baltic Sea	Dobrzeń (PL)	Wrocław/ Pasikowice (PL)	New 50km 400kV 2x1870 MVA OHL double circuit line from Dobrzeń to splitted Pasikowice - Wrocław line.	Power output from generating units connected to the transmission network.	Conventional generation integration ; improved security of supply ; Increased of NTC.	design & permitting	2015	
325	CCE Baltic Sea	Krajnik (PL)	Pomorzany (PL)	A new AC substation in Szczecin Agglomeration Area. New substation Pomorzany is connected by new 24km 220kV 522 MVA line Krajnik - Pomorzany and 220/110kV (275 MVA) transformer to existing 110kV switchgear.	Power output from generating units connected to the transmission network.	Conventional generation integration ; improved security of supply.	planned	2015	
326	CCE Baltic Sea	Grudziądz (PL)	Gdańsk Przyjaźń (PL)	A new AC 400/110kV substation between existing substation Grudziądz and planned substation Gdańsk Przyjaźń with transformation 400 MVA . New substation Pelplin is connected by new 110km 400kV 2x1870 MVA OHL double circuit lines Grudziądz - Pelplin and Pelplin - Gdańsk Przyjaźń after dismantling of 220kV line Jasinieć - Gdańsk.	Power output from generating units connected to the transmission network.	Conventional generation integration ; improved security of supply.	planned	2015	
327	CCE Baltic Sea	Kozienice (PL)	Ołtarzew (PL)	New 130km 400kV 2x1870 MVA OHL double circuit line Kozienice - Ołtarzew.	Power output from generating units connected to the transmission network.	Conventional generation integration ; improved security of supply.	design & permitting	2015	
328	CCE Baltic Sea	Piła Krzewina (PL)	Bydgoszcz Zachód (PL)	New 84km 400kV 1870 MVA OHL interconnection line Piła Krzewina - Bydgoszcz Zachód temporarily on 220kV.	Power output from RES.	RES integration ; improved security of supply.	design & permitting	2015	

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REF on map	RGs	Substation 1	Substation 2	Project characteristics	Investment need alleviated	Expected benefits	Progress status	Expected time of commissioning	TENE
329	CCE Baltic Sea	Żydowo (PL)	Ślupsk (PL)	A new AC 400/110kV substation next to existing 220/110kV substation in Northern Poland with transformation 400/110kV 400 MVA. New substation Żydowo is connected by new 70km 400kV 2x1870 MVA OHL double circuit lines Żydowo - Ślupsk and Żydowo - Gdańsk Przyjaźń. Dismantling of existing 220/110kV transformers.	Power output from RES.	RES integration ; improved security of supply.	planned	2015	
330	CCE Baltic Sea	Żydowo (PL)	Gdańsk Przyjaźń (PL)	A new AC substation in Gdańsk Agglomeration Area. New substation Gdańsk Przyjaźń is connected by splitting and extending of one circuit of existing line Żarnowiec - Gdańsk Blonia and new 150km 400kV 2x1870 MVA double circuit OHL line Żydowo - Gdańsk Przyjaźń with one circuit from Żydowo to Gdańsk temporarily on 220kV after dismantling of 220kV line Żydowo - Gdańsk.	Power output from RES.	RES integration ; improved security of supply.	planned	2015	
331	CCE Baltic Sea	Gorzów (PL)	Leśniów (PL)	Upgrading of sag limitations (new capacity 461 MVA).	Power output from RES, upgrading of sag limitations.	RES integration ; improved security of supply; Increase of NTC.	planned	2015	
332	CCE Baltic Sea	Reclaw (PL)	Glinki (PL)	A new AC substation in Szczecin Agglomeration Area. New substation Reclaw is connected by new 52km 220kV 522 MVA line Reclaw - Glinki, existing 110kV single circuit line Morzyczyn - Reclaw upgraded to 220kV and two 220/110kV (275 MVA) transformer to existing 110kV switchgear. Splitting of existing 220kV line Morzyczyn - Police and expanding to Glinki substation.	Power output from RES.	RES integration ; improved security of supply.	design & permitting	2015	
333	CCE Baltic Sea	Pasikowice (PL)	Świebodzice (PL)	A new AC substation in Wrocław Agglomeration Area. New substation Wrocław is connected to new 135km (sum) 400kV 1870 MVA lines: Pasikowice-Wrocław and Świebodzice - Wrocław. New 400kV Wrocław substation with 2x400 MVA, 400/110kV transformation. New 400kV Świebodzice substation with 1x500MVA, 400/220kV transformation and 1x400 MVA, 400/110kV transformation. New 400kV OHL interconnection line Wrocław - Świebodzice after dismantling of 220kV line Świebodzice - Biskupice and new 400kV OHL interconnection line Pasikowice - Wrocław, including new Wrocław substation.	Safe operation of the system - change of the voltage in the network (elimination of the network congestions) and safe operation of the system - increase of the reliability (elimination of the network congestions).	Improved security of supply.	under construction	2015	
334	CCE Baltic Sea	Pątnów (PL)	Grudziądz (PL)	New 174km 400kV 2x1870 MVA double circuit OHL line Pątnów - Grudziądz after dismantling of 220kV line Pątnów - Jasiniec (two parallel lines) and Jasiniec - Grudziądz. One circuit from Pątnów to Grudziądz via Jasiniec temporarily on 220kV.	Safe operation of the system - change of the voltage in the network (elimination of the network congestions).	Improved security of supply; Increase of NTC.	design & permitting	2015	X
335	CCE Baltic Sea	Ostrołęka (PL)	Olsztyn Mątki (PL)	New 138km 400kV 2x1870 MVA double circuit OHL line Ostrołęka - Olsztyn Mątki after dismantling of 220kV line Ostrołęka - Olsztyn with one circuit from Ostrołęka to Olsztyn temporarily on 220kV.	Safe operation of the system - change of the voltage in the network (elimination of the network congestions).	Improved security of supply.	design & permitting	2015	

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336	CCE Baltic Sea	Warszawa Praga (PL)		A new AC substation with 2x275 MVA 220/110kV transformation between existing substations Miłosna and Mory in Warszawa Agglomeration Area, New substation Warszawa Praga is connected by splitting and extending existing line Miłosna-Mory.	Safe operation of the system - increase of the power demand.	Improved security of supply.	planned	2015	
337	CCE Baltic Sea	Radkowice (PL)	Kielce Piaski (PL)	New 26km 220kV 522 MVA OHL line Radkowice -Kielce Piaski, in Kielce agglomeration area.	Safe operation of the system - increase of the reliability (elimination of the network congestions).	Improved security of supply.	design & permitting	2015	
338	CCE Baltic Sea	Kozienice (PL)	Mory/ Piaseczno (PL)	Replacement of conductors (high temperature conductors).	Safe operation of the system - increase of the reliability (elimination of the network congestions).	Improved security of supply.	under construction	2015	
339	CCE Baltic Sea	Morzyczyn (PL)		A new AC substation in Szczecin Agglomeration Area with transformation 400/220kV 330 MVA and 400/110kV 330 MVA. New substation Morzyczyn is connected by splitting and extending existing 400kV line Krajnik - Dunowo.	Safe operation of the system - increase of the reliability (elimination of the network congestions).	Improved security of supply.	under construction	2015	
340	CCE Baltic Sea	Lubocza (PL)		An existing substation in Kraków Agglomeration Area. Existing substation will be upgraded by splitting and extending existing 220kV line Siersza- Klikowa and installing second ATR 220/110kV (160 MVA).	Safe operation of the system - increase of the reliability (elimination of the network congestions).	Improved security of supply.	planned	2015	
341	CCE Baltic Sea	Pątnów (PL)	Wrocławek (PL)	Upgrading of sag limitations OHL 220kV (389 MVA).	Safe operation of the system - increase of the reliability (elimination of the network congestions).	Improved security of supply; Increase of NTC.	planned	2015	
342	CCE Baltic Sea	Czarna (PL)	Polkowice (PL)	New 400kV OHL interconnection line Czarna -Polkowice (1870 MVA, 22km), including new Polkowice 400kV substation with 500 MVA, 400/220kV transformation.	Safe operation of the system - couplings 220kV with 400kV transmission network (elimination of the network congestions).	Improved security of supply; Increase of NTC.	design & permitting	2015	
343	CCE Baltic Sea	Byczyna (PL)		Upgrading of existing AC 220kV substation Byczyna. A new 400kV AC substation in Silesia Agglomeration Area with transformation 400/220kV 2x 500 MVA. New substation Byczyna is connected by splitting and extending existing line Tarnów - Tuczna.	Safe operation of the system - couplings 220kV with 400kV transmission network (elimination of the network congestions) and Power output from generating units connected to the transmission network.	Conventional generation integration ; improved security of supply.	under construction	2015	
344	CCE Baltic Sea	Lublin Systemowa (PL)	Abramowice (PL)	New 220kV cable/OHL interconnection line Lublin Systemowa - Abramowice, in Lublin agglomeration area (522 MVA, 18km).	Safe operation of the system - couplings 220kV with 400kV transmission network (elimination of the network congestions).	Improved security of supply.	design & permitting	2015	
345	CCE Baltic Sea	Łagisza (PL)		A new AC 400kV switchgear in existing substation Łagisza (with transformation 400/220kV 500 MVA and 400/110kV 330 MVA) is connected by splitting and extending of existing 400kV lines Rokitnica - Tuczna.	Connection to the network of power plants.	Conventional generation integration ; improved security of supply.	under construction	2015	
346	CCE Baltic Sea	Halemba (PL)		Halemba substation is connected by splitting and extending of existing 220kV lines Kopanina - Katowice.	Power output from generating units connected to the transmission network.	Conventional generation integration ; improved security of supply.	planned	2015	

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347	CCE Baltic Sea	Gdańsk I (PL)		A new AC 400kV switchgear in existing substation Gdańsk I is connected by splitting and extending of existing 400kV lines Żarnowiec - Gdańsk Blonia.	Safe operation of the system - couplings 220kV with 400kV transmission network (elimination of the network congestions).	Improved security of supply.	under construction	2015	
348	CCE Baltic Sea	several substations in PSE O control area		Installation additional and exchange existing transformers (400/110kV and 220/110kV), capacitors and SVC in substations, upgrading of substations.	Safe operation of the system - increase of the power demand and voltage and reactive power control.	Improved security of supply.	planned	2015	
349	CCE Baltic Sea	Puławy (PL)		A new AC 400kV switchgear in existing substation Puławy (with transformation 400/220kV 500 MVA) will be connected by splitting and extending existing 400kV lines: Koźnice- Lublin Systemowa and Koźnice - Ostrowiec.	Connection to the network of power plants.	Conventional generation integration ; improved security of supply.	planned	2020	
350	CCE Baltic Sea	"East" Power Plant (PL)		A new AC substation "East" Power Plant + Construction of a new 400kV OHL East Power Plant -Siedlce Ujrzanów (2x1870 MVA)+ Construction of a new 400kV OHL East Power Plant -Chelm with single circuit (1870 MVA) + Construction of a new 400kV OHL East Power Plant - Lublin Systemowa (2x1870 MVA). A new AC 400kV switchgear in existing substation Chelm with transformation 400/220kV 500 MVA.	Connection to the network of power plants and Power output from generating units connected to the transmission network.	Conventional generation integration ; improved security of supply.	planned	2020	
351	CCE Baltic Sea	Blachownia (PL)		A new AC 400kV switchgear in existing substation Blachownia (with transformation 400/220kV 500 MVA and 400/110kV 400 MVA) will be connected by splitting and extending existing 400kV line Joachimów - Wielopole and 220kV line Kedzierzyn - Groszowice.	Connection to the network of power plants.	Conventional generation integration ; improved security of supply.	planned	2020	
352	CCE Baltic Sea	Dunowo (PL)	Plewiska (PL)	Construction of a new double circuit 400kV OHL Dunowo - Żydowo (2x1870 MVA) partly using existing 220kV line + Construction of a new 400kV OHL Plewiska - Piła Krzewina - Żydowo (2x1870 MVA); single circuit temporarily working as a 220kV + A new AC 400kV switchgear in existing substation Piła Krzewina with transformation 400/220kV 500 MVA.	Power output from RES and connection to the network of RES.	RES integration ; improved security of supply.	design & permitting	2020	X
353	CCE Baltic Sea	Krajnik (PL)	Baczyna (PL)	Construction of a new double circuit 400kV OHL Krajnik - Baczyna (2x1870 MVA, 91km); single circuit temporarily working at 220kV on Krajnik - Gorzów part + New substation 400kV Baczyna will be connected by splitting and extending existing line Krajnik-Plewiska + Upgrading of limitations line Krajnik - Plewiska.	Power output from RES + Reinforcement of Polish internal grid.	RES integration ; improved security of supply; Increase of NTC.	planned	2020	
354	CCE Baltic Sea	Byczyna (PL)	Podborze (PL)	Double line 400kV Byczyna-Czeczott-Podborze (2x1870 MVA, 155km) will be built in parallel with 220kV line Byczyna-Bieruń-Poręba-Podborze in the same road + New substation 400 and 220kV Podborze (with transformation 400/220kV 500 MVA) will be connected by splitting and extending existing lines Wielopole-Nosowice, Kopanina-Liskovec, Bujaków-Liskovec, Komorowice-Bieruń, Moszczenica-Poręba and new double circuit line 400kV Podborze-Czeczott.	Safe operation of the system - change of the voltage in the network (elimination of the network congestions) and safe operation of the system - increase of the reliability (elimination of the network congestions).	Improved security of supply.	design & permitting	2020	

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355	CCE Baltic Sea	Mikulowa (PL)	Świebodzice (PL)	Double circuit line 220kV Mikulowa-Świebodzice will be upgraded to 400kV - single circuit temporarily working at 220kV (2x1870 MVA).	Safe operation of the system - change of the voltage in the network (elimination of the network congestions).	Improved security of supply; Increase of NTC.	planned	2020	X
356	CCE Baltic Sea	Janów (PL)		New substation 400kV Janów (with transformation 400/110kV 400 MVA) will be connected by splitting and extending existing line Rogowiec-Plock.	Safe operation of the system - increase of the power demand.	Improved security of supply.	planned	2020	
357	CCE Baltic Sea	Joachimów (PL)		Replacement of a transformer 400/220kV (500 MVA).	Safe operation of the system - increase of the power demand.	Improved security of supply.	planned	2020	
358	CCE Baltic Sea	Ostrów (PL)	Kromolice (PL)	Installation of a 2nd 400kV circuit along an already existing line on the same voltage. (1870 MVA, 212km).	Safe operation of the system - increase of the reliability (elimination of the network congestions).	Improved security of supply; Increase of NTC.	planned	2020	
359	CCE Baltic Sea	Morzyczyn (PL)	Pomorzany/ Glinki (PL)	New line 220kV (522 MVA).	Safe operation of the system - increase of the reliability (elimination of the network congestions).	Improved security of supply.	planned	2020	
360	CCE Baltic Sea	Miłosna (PL)	Siekierki (PL)	New cable connection 220kV Miłosna - Warszawa Siekierki (333 MVA, 10km).	Safe operation of the system - increase of the reliability (elimination of the network congestions).	Improved security of supply.	planned	2020	
361	CCE Baltic Sea	Ołtarzew (PL)	Mory (PL)	Replacement of conductors (high temperature conductors). (new capacity 461 MVA).	Safe operation of the system - increase of the reliability (elimination of the network congestions).	Improved security of supply.	planned	2020	
362	CCE Baltic Sea	Wielopole (PL)	Moszczenica (PL)	Replacement of conductors (high temperature conductors). (new capacity 461 MVA).	Safe operation of the system - increase of the reliability (elimination of the network congestions).	Improved security of supply.	planned	2020	
363	CCE Baltic Sea	Byczyna (PL)	Siersza (PL)	Replacement of conductors (high temperature conductors). (new capacity 461 MVA).	Safe operation of the system - increase of the reliability (elimination of the network congestions).	Improved security of supply.	planned	2020	
364	CCE Baltic Sea	Czarna (PL)	Polkowice (PL)	New line will be second 400kV circuit to existing line in the same direction. (1870 MVA, 22km).	Safe operation of the system - couplings 220kV with 400kV transmission network (elimination of the network congestions).	Improved security of supply and increase of NTC.	planned	2020	
365	CCE Baltic Sea	Wyszków (PL)		New substation 400kV Wyszków (with transformation 400/110kV 400 MVA) will be connected by splitting and extending line Ostrołęka-Stanisławów.	Safe operation of the system - increase of the power demand.	Improved security of supply.	design & permitting	2020	
366	CCE Baltic Sea	Rzeszów (PL)	Chmielnicka (UA)	Establish existing 750kV interconnection between Poland and Ukraine. Mode of operation on border lines (synchronous/asynchronous) depends on results of future study concerning possibility of synchronous connection of Ukraine and Moldova to continental part of ENTSO-E and bilateral Polish - Ukrainian agreement.	The project is the modernisation and resumption of existing 750kV interconnection between Poland and Ukraine.	Increase of NTC and Improved security of supply.	planned	2020	

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367	CCE Baltic Sea	several substations in PSE O control area		Installation of an additional transformer + replacement of an existing one (400/110kV and 220/110kV) and shunt reactors in substations, upgrading and decommissioning of substations.	Safe operation of the system - increase of the power demand and voltage and reactive power control.	Improved security of supply.	planned	2020	
368	CCE Baltic Sea	Elk (PL)	PL-LT border (LT)	Construction of a new 400kV OHL Elk to PL-LT border. (2x1870 MVA, 108km).	Reinforcement in Polish internal grid in connection with project: Elk (PL) - Alytus (LT).	Increase of NTC and Improved security of supply with expected additional 600MW capacity between PL and LT. Interconnection LT-PL allow import/export between Poland and Baltic. Also this interconnection is crucial to make possible a synchronous interconnection of Baltic with other ENTSO-E countries.	design & permitting	2015	
369	CCE Baltic Sea	Siedlce Ujrzanów (PL)	Miłosna (PL)	Construction of a new 400kV OHL Siedlce Ujrzanów - Miłosna (1870 MVA, 84km) + A new AC 400kV switchgear in existing substation Siedlce Ujrzanow with transformation 400/110kV 400 MVA.	Reinforcement in Polish internal grid in connection with project: Elk (PL) - Alytus (LT).	Improved security of supply and increase of NTC.	design & permitting	2015	
370	CCE Baltic Sea	Elk (PL)	New substation (Rutki)	Construction of a new 400kV double circuit OHL Elk - Rutki (2x1870 MVA, 95km) + A new AC 400kV switchgear in existing substation Elk (in two stages) + A new AC substation Rutki.	Reinforcement in Polish internal grid in connection with project: Elk (PL) - Alytus (LT).	Improved security of supply and increase of NTC.	design & permitting	2015	X
371	CCE Baltic Sea	Ostrołęka (PL)	Narew (PL)	Construction of a new 400kV OHL Ostrołęka-New substation (Rutki)-Narew (1870 MVA, 120km) + A new AC 400kV switchgear in existing substation Ostroleka (in two stages) with transformation 400/220kV 500 MVA and with transformation 400/110kV 400 MVA.	Reinforcement in Polish internal grid in connection with project: Elk (PL) - Alytus (LT).	Improved security of supply and increase of NTC.	design & permitting	2015	
372	CCE Baltic Sea	Oltarzew (PL)		A new AC substation with two transformers 400/220kV 2x500 MVA and one 400/110kV 400 MVA will be connected by splitting 400kV line Rogowiec-Miłosna and Miłosna-Plock and 220kV line Mory-Sochaczew and Mory-Janów.	Reinforcement in Polish internal grid in connection with project: Elk (PL) - Alytus (LT).	Improved security of supply and increase of NTC.	under construction	2015	
373	CCE Baltic Sea	Ostrołęka (PL)	Stanisławów (PL)	Single circuit line 220kV Ostrołęka-Miłosna will be partly upgraded to double circuit line 400kV (2x1870 MVA, 106km) with development of Ostrołęka 400kV substation + New substation 400kV Stanisławów will be connected by splitting and extending existing line Miłosna-Narew and Miłosna-Siedlce.	Reinforcement of Polish internal grid to make possible power transfer capacity (between PL and LT) of 1000MW.	Improved security of supply and increase of NTC.	design & permitting	2020	
374	CCE Baltic Sea	Kozienice (PL)	Siedlce Ujrzanów (PL)	Existing single circuit line will be upgraded to 400kV line in the same direction (1870 MVA, 90km).	Reinforcement of Polish internal grid to make possible power transfer capacity (between PL and LT) of 1000MW.	Improved security of supply and increase of NTC.	design & permitting	2020	
375	CCE Baltic Sea	Plock (PL)	Olsztyn Mątki (PL)	New single circuit line 400kV (1870 MVA, 180km) with development of Olsztyn Mątki 400kV substation.	Reinforcement of Polish internal grid to make possible power transfer capacity (between PL and LT) of 1000MW.	Improved security of supply and increase of NTC.	design & permitting	2020	

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376	CCE Baltic Sea	Alytus (LT)	PL-LT border (PL)	Construction of Back-to-Back convertor station near Alytus 330kV substation. Construction of double circuit 400kV OHL between Alytus and PL-LT border. Construction of 330kV AC line Alytus-Kruonis. Length of line: 46km.	Project: Elk (PL) - Alytus (LT).	Currently there are no connections between LT and PL. Increase of NTC and Improved security of supply.	design & permitting	2015	
377	Baltic Sea	Klaipeda (LT)	Telsiai (LT)	New single circuit 330kV OHL (943 MVA, 85km).	The new line is required to take advantage of full capacity of HVDC line to Sweden.	Increase of NTC and Improved security of supply.	design & permitting	2013	
378	Baltic Sea	Panevezys (LT)	Musa (LT)	New single circuit 330kV OHL (1080 MVA, 80km).	The new line is required to take advantage of full capacity of HVDC line to Sweden.	Increase of NTC.	planned	2016	
379	Baltic Sea	Kruonis (LT)	Alytus (LT)	New double circuit 330kV OHL (2x1080 MVA, 53km).	new line is required to take advantage of full capacity of link to Poland.	Increase of NTC and Improved security of supply.	planned	2020	
380	Baltic Sea	Visaginas (LT)	Kruonis (LT)	New single circuit 330kV OHL (1080 MVA, 200km).	new line is required to take advantage of full capacity of link to Poland.	Increase of NTC.	planned	2020	
381	Baltic Sea	Visaginas (LT)	Liksna (LV)	Upgrade single circuit OHL (943 MVA, 50km).	new line is required to take advantage of full capacity of link to Poland.	Increase of NTC.	under consideration	2020	
382	Baltic Sea	Vilnius (LT)	Neris (LT)	New single circuit 330kV OHL (943 MVA, 50km).	Additional line could be required when new Visaginas NPP will be build.	Improved security of supply.	planned	2020	
382a	Baltic Sea	Bitenai (LT)		New 330kV switching station.	Switching station will be build near Kaliningrad district border and will connect existing 330kV OHL Klaipeda-Sovetsk and Jurbarkas-Sovetsk.	Improved security of supply.	under construction	2011	
383	Baltic Sea	Klaipeda (LT)	Nybro (SE)	(NordBalt) A new 300kV HVDC VSC partly subsea and partly underground cable between Lithuania and Sweden. (440km).	Connection between Lithuania and Sweden. 440km long.	Improved the market integration Nordic Baltic. Currently is no connection between LT and Sweden.	design & permitting	2015/2016	
384	Baltic Sea	RigaCHP1 (LV)	Imanta (LV)	A new 12.5km AC 330kV cable will be built from RigaCHP1 substation to Imanta substation. Both substations will be reconstructed, according new line connecting. New cable will be underground and one part will be underwater (under Daugava river). Expected capacity: 880MW.	New line will increase transmission capacity in the Riga region. Reliability and security of supply in town Riga and Latvia.	Improved security of supply and increase of NTC.	design & permitting	2012	X
385	Baltic Sea	Grobina (LV)	Imanta (LV)	"Kurzeme Ring" is a Latvian grid reinforcement project with 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. Upgrade of double circuit 330kV double circuit OHL new 380 330. (Capacity 800MW).	New interconnection lines between Western and Central part of Latvia. New transmission line will increase Security of Supply in Western and Central part of Latvia. Platform for integration of new renewable power generation.	Improved security of supply; RES integration ; Increase of NTC. Mentioned line reinforcement is part of the NordBalt project and planned connection point to Estonian-Latvian third interconnection.	planned	2016	X

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386	Baltic Sea	EE (Lihula-Sindi)	LT (Ventspils-Dundaga- TEC2)	Latvian-Estonian third interconnection will consist of OHL Harku-Sindi-Lihula in Estonian part, OHL Imanta-Tume-Dundaga-Ventspils in Latvian part, and sea cable between cross-border DC or AC cable. Final interconnection type and final interconnection and transmission line route will be selected in middle of 2010. At present three alternative route variants researched. Final interconnection length, DC voltage and transmission capacity will be selected in feasibility and technical study in the middle of 2010. The connection would be as a new single circuit line mixed (OHL+subsea cable) up to 500kV.	Need to increase the current transfer capacity between Estonia and Latvia. Need to increase Security of Supply in Latvia, Estonia and all Baltic countries. Platform for integration of new renewable power generation in both countries.	Increase of NTC, improved security of supply and RES integration. Increasing security of supply in Baltic. Capacity congestion and number of hours with market division will be reduced. Risk of shortage of energy will be reduced in the Nordic and Baltic power system. Expected NTC 600-1200MW.	under consideration	2020	X
387	Baltic Sea	Tartu (EE)	Sindi (EE)	A new 162km internal connection will be established on existing route resulting in double circuit line with 2 different voltages (330kV / 110kV).	Depending on market situation the cross-border connection between Latvia and Estonia can be congested. In addition it has positive impact to security of supply in Baltic.	Improved security of supply, RES integration and increase of NTC. New internal connection is for ensuring voltage stability in Western part of Estonia and it is also related to transfer capacity regarding new interconnections between Estonia and Latvia and power exchanges between Nordic and Continental Europe.	design & permitting	2014	
388	Baltic Sea	Harku (EE)	Sindi (EE)	New single circuit 400 - 220 OHL. (Capacity 1200 MVA, 140-160km). Major part of new internal connection will be established on existing right of way on the Western part of Estonian mainland and the line voltage will be 330kV.	Depending on market situation the cross-border connection between Latvia and Estonia can be congested. In addition it has positive impact to Security of Supply in Baltic.	Increase of NTC ; RES integration ; improved security of supply in Baltic. The new internal connection will ensure transfer capacity between Estonia and Latvia and facilitate power exchanges between Nordic and Continental Europe.	planned	2018	
389	Baltic Sea	Eesti (EE)	Püssi (EE)	Reinforcement of existing 57km single circuit 330kV OHL. Expected capacity:1200 MVA.	Depending on market situation the cross-border connection between Finland and Estonia can be congested. In addition it has positive impact to security of supply in Baltic.	Increase of NTC, reduction of infrastructure vulnerability and improved security of supply. New internal connection is for ensuring transfer capacity concerning second interconnection between Estonia and Finland.	under construction	2010	
390	Baltic Sea	Balti (EE)	Püssi (EE)	Reconstruction of 68km single circuit 400-220kV OHL.	Depending on market situation the cross-border connection between Finland and Estonia can be congested. In addition it has positive impact to security of supply in Baltic.	Increase of NTC, reduction of infrastructure vulnerability and improved security of supply. New internal connection is for ensuring transfer capacity concerning second interconnection between Estonia and Finland.	design & permitting	2011	

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391	Baltic Sea	Püssi (EE)	Anttila (FI)	A new HVDC (450kV) connection will be built between Estonia and Finland. On the Finnish side, a 14km DC overhead line will be built to a new substation Anttila where the converter station will be placed. On the Estonian side, a 11km DC cable line will be built to an existing substation Püssi where the converter station will be placed. Length of marine cable is 140km. Expected capacity: 650MW.	Depending on market situation the cross-border connection between Finland and Estonia can be congested. In addition it has positive impact to security of supply in Baltic.	Increase of NTC; improved security of supply; RES integration ; 650MW ; Increasing Security of Supply in Baltic. Capacity congestion and number of hours with market division will be reduced. Risk of shortage of energy will be reduced in the Nordic and Baltic power system.	design & permitting	2013	
392	Baltic Sea	Ylikkälä (FI)	Huutokoski (FI)	New 155km single circuit 400kV OHL and renovation of 400kV substations in Ylikkälä and Huutokoski. Expected capacity: 1850 MVA.	High imports from Russia + high local surplus of power.	Increase of NTC and Improved security of supply.	design & permitting	2013	
393	Baltic Sea	Seinäjoki Ulvila Ventusneva Kemnmaa (FI)	Tuovila Kristinestad Pyhänselkä (FI)	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. Commissioning of first section in year 2011, second in 2014 third in ca. 2018 and fourth ca 2020. total length of lines: 520 km. Expected capacity: 1850 MVA.	Integration of new generation + replacement of ageing 220kV system + increased transmission capacity demand.	Increase of NTC, RES integration and Improved security of supply.	under construction	2011/2020	
394	Baltic Sea	Hikiä (FI)	Forssa (FI)	New 80km single circuit 400kV OHL. Expected capacity:1850 MVA.	Changed exchange patterns.	Increase of NTC.	under consideration	2015	
395	Baltic Sea	Rauma (FI)	Finnböle (SE)	A new 500kV HVDC connection will be built in parallel with the existing one between Finland and Sweden. On the Swedish side, a 70km direct current overhead line will be built to a new substation Finnböle where the converter station will be placed. Total length of line: 300km and capacity: 800MW.	Depending on a hydro situation and market situation the cross-border connection between Finland and Sweden can be congested. In addition there is a large generator under construction in the vicinity of the Finnish side of the border.	Increase of NTC, improved security of supply and annual losses reduction. Congestion and number of hours with market division will be reduced. Redispatching of load flow between 400kV interconnectors at North and Fenno-Skan will reduce power losses. Cost of ancillary services can be decreased. Risk of shortage of energy will be reduced in the Nordic power system.	under construction	2011	
396	Baltic Sea	Finland Nord (FI)	Sweden North (SE)	Third single circuit 400kV AC OHL between Sweden and Finland. Expected capacity: 1850 MVA.	New wind power generation + larger units + decommissioning of 220kV interconnector.	New wind power generation + larger units + decommissioning of 220kV interconnector.	under consideration	2018/2020	
397	Baltic Sea North Sea	Varangerbotn (NO)	Pirttikoski or Petäjäskoski (FI)	New single circuit 380 - 400kV OHL (500km).	Enabling RES (wind and small scale hydro power) to connect to the grid (currently limited grid capacity). Enhance the Security of Supply for the Finnmark area, including critical oil and gas installations.	Security of Supply for the Finnmark area. Enabling new demand in critical oil and gas installations. Enabling RES (wind power) in Northern Norway.	under consideration	2020/2025	

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398	Baltic Sea North Sea	Under consideration (SE)		New series compensation of OHL.	Power flow limited by reactive power issues.	Increased power flow.	under consideration	2016/2020	
399	Baltic Sea	Vasteras (SE)	Lindbaka (SE)	Upgrade/Replacement of existing single circuit 220kV lines to 400kV.	Increase power flow.	Increase of NTC, improved security of supply and annual losses reduction.	under consideration	2016/2020	
400	Baltic Sea	Ekhyddan (SE)	Barkeryd (SE)	New single circuit 400kV OHL.	Increased installed nuclear capacity.	Improved security of supply.	under consideration	2016/2020	
401	Baltic Sea	Västervik (SE)	Gotland (SE)	New AC or DC subsea cable interconnection 400kV (1000 MW).	Integration of new renewable power generation.	RES integration.	under consideration	2016/2020	
402	Baltic Sea North Sea	Hurva/Hallsberg (SE)	Tveiten (NO)	"South West link" consisting of three main parts: 1) New 400kV line between Hallsberg and Barkeryd 2) New double HVDC VSC underground cable line between Barkeryd and Hurva 3) New HVDC VSC line between Barkeryd and Tveiten/Norway. The project also include new substations and converter stations in the connection points line double circuit new OHL Hallsberg - Barkeryd 170km, underground VSC Barkeryd - Hurva 250km and VSC Barkeryd - Tveiten with 103km on the Norwegian side. Expected capacity: 1200MW.	Market integration. Integration of new renewable power generation.	Increase of NTC, improved security of supply and RES integration.	planned	2014	
403	Baltic Sea North Sea	Scandinavia North (NO)	Scandinavia South (SE)	A joint Statnett & Svenska Kraftnat study north - south reinforcement (AC or VSC), expected length: 400 - 500km under study.	Integration of new renewable power generation / limit to renewable export.	RES integration.	under consideration	long term	
405	Baltic Sea North Sea	Kristiansand (NO)	Rød (NO)	Voltage upgrading of an existing single circuit 300kV OHL and a new section of OHL between Rød and Bamle. Total length: 175km.	New interconnection lines between Southern Norway and Europe. Security of supply for the Oslo region.	Increase of NTC and reduction of infrastructure vulnerability. Voltage upgrading required in the AC grid to enable the increase of cross-border capacities in 142, 425, 426.	design & permitting	2014	
406	Baltic Sea North Sea	Kristiansand (NO)	Tonstad - Saurdal (NO)	Voltage upgrading of existing single circuit 300kV OHL Kristiansand-Feda-Tonstad-Lyse-Saurdal Seen as an extension of the new HVDC cables.	New interconnection lines between Southern Norway and Europe. Integration of new renewable power generation.	Increase of NTC, RES integration. Voltage upgrading required in the AC grid to enable the increase cross-border capacities in 142, 425, 426.	design & permitting	2013/2016	
407	Baltic Sea North Sea	Tonstad (NO)	Arendal (NO)	Voltage upgrading of existing single circuit 300kV OHL Tonstad-Solhom-Arendal.	New interconnection lines between Southern Norway and Europe. Integration of new renewable power generation.	Increase of NTC, RES integration. Voltage upgrading required in the AC grid to enable the increase cross-border capacities in 142, 425, 426.	planned	2016/2018	
408	Baltic Sea North Sea	Kristiansand, Feda (NO)		Reactive compensation due to HVDC links NorNed and Skagerak 4. Reactive power devices in 400kV substations.	Increased market integration. Reactive compensation due to HVDC links NorNed and Skagerak 4.	Improved security of supply and reduction of infrastructure vulnerability.	planned	2011/2014	

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409	Baltic Sea North Sea	Fedra, Tonstad (NO)		Reactive power devices in 400kV substations.	Increased market integration. Reactive compensation due to HVDC links.	Improved security of supply.	planned	2017/2018	
410	Baltic Sea North Sea	Kristiansand (NO)		Spare transformer for the HVDC Skagerak interconnection transformer.	Increased market integration.	Improved security of supply and reduction of infrastructure vulnerability.	under construction	2010	
411	Baltic Sea North Sea	Rød (NO)	Sylling (NO)	Voltage upgrading of existing single circuit 300kV OHL Rød-Tveiten-Flesaker-Sylling in connection with the new HVDC line to Sweden, the Syd Vest link.	Increased market integration.	Increase of NTC and improved security of supply.	under consideration	2012/2016	
412	Baltic Sea North Sea	Rød (NO) - Sylling (NO) - Flesaker (NO) -	Hasle (NO) Tegneby (NO) Tegneby (NO)	Reinvestment and capacity increase Oslofjord 400kV subsea cables. Three cables: Filtvedt - Brenntangen, Solberg - Brenntangen, and Teigen - Evje.	Enhance the Security of Supply for the Oslo area, increase cross-border capacity.	Improved security of supply and increase of NTC.	design & permitting	2011/2013	
413	Baltic Sea North Sea	Ørskog (NO)	Fardal (NO)	New 300km single circuit 400kV OHL.	Critical situation with security of supply in the Mid-Norway area.	Improved security of supply, RES integration and increase of NTC.	design & permitting	2013/2014	
413a	Baltic Sea North Sea	Sima (NO)	Samnanger (NO)	New 420kV line Sima-Samnanger to ensure security of supply in the region of Hordaland/ Bergen, and to integrate new hydro power.	Enhance the Security of Supply for the Hordaland area. Enabling RES small scale hydro power in Western Norway to connect to the grid (currently limited grid capacity).	Improved security of supply; RES integration.	design & permitting	2013/2014	
414	Baltic Sea North Sea	Fardal (NO)	Aurland (NO)	Voltage upgrading of existing single circuit 300kV OHL Fardal-Aurland Extension of 413 - Ørskog - Fardal.	RES integration.	Improved security of supply, RES integration and increase of NTC.	planned	2015/2017	
415	Baltic Sea North Sea	Namsos (NO)	Klæbu (NO)	Voltage upgrading of existing single circuit 300kV OHL Namsos-Klæbu.	Enabling RES (wind and small scale hydro power) to connect to the grid (currently limited grid capacity).	RES integration.	planned	2013	
416	Baltic Sea North Sea	Klæbu (NO)	Aura/ Viklandet (NO)	Voltage upgrading of existing single circuit 300kV OHL Klæbu-Aura.	Enabling RES (wind and small scale hydro power) to connect to the grid (currently limited grid capacity).	RES integration.	planned	2016	
417	Baltic Sea North Sea	Aura/Viklandet (NO)	Fåberg (NO)	Voltage upgrading of existing single circuit 300kV OHL Aura/Viklandet-Fåberg.	Enabling RES (wind and small scale hydro power) to connect to the grid (currently limited grid capacity).	RES integration.	under consideration	2016/2020	
418	Baltic Sea North Sea	Nedre Røssåga (NO)	Namsos (NO)	Voltage upgrading of existing single circuit 300kV Nedre Røssåga-Tunnsjødal-Namsos OHL to 400kV.	Enabling RES (wind and small scale hydro power) to connect to the grid (currently limited grid capacity).	RES integration.	planned	2015	
419	Baltic Sea North Sea	Namsos (NO)	Storheia (NO)	New 119km 800MVA single circuit Namsos-Roan-Storheia OHL to connect new wind power generation at Fosen.	Enabling RES (wind and small scale hydro power) to connect to the grid (currently limited grid capacity).	RES integration.	design & permitting	2013	

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420	Baltic Sea North Sea	Storheia (NO)	Orkdal / Trollheim (NO)	New Storheia-Snillfjord-Orkdal/Trollheim single circuit 400kV line to connect new wind power generation in the Snillfjord area; part of the line will be a subsea cable.	Enabling RES (wind and small scale hydro power) to connect to the grid (currently limited grid capacity).	RES integration.	design & permitting	2015	
421	Baltic Sea North Sea	Ofofen (NO)	Balsfjord (NO)	New 150km single circuit 400kV OHL.	Enabling RES (wind in Northern Norway) to connect to the grid (currently limited grid capacity). Enhance the Security of Supply of the Finnmark area, including critical oil and gas installations.	Improved security of supply; RES integration.	design & permitting	2014/2015	
422	Baltic Sea North Sea	Balsfjord (NO)	Hammerfest (NO)	New 355km single circuit 400kV OHL.	Enabling RES (wind in Northern Norway) to connect to the grid (currently limited grid capacity). Enhance the Security of Supply for the Finnmark area, including critical oil and gas installations.	Improved security of supply; RES integration.	design & permitting	2016	
423	Baltic Sea North Sea	Skaidi (NO)	Varangerbotn (NO)	New single circuit 400kV OHL.	Enabling RES (wind in Northern Norway) to connect to the grid (currently limited grid capacity). Enhance the Security of Supply for the Finnmark area, including critical oil and gas installations.	Improved security of supply; RES integration.	planned	2020/2025	
424	Baltic Sea North Sea	kVilldal (NO)	UK (substation to be determined)	A new 1400MW HVDC bipolar installation connecting Western Norway and the UK via 800km subsea cable; DC voltage is to be determined.	Currently there is no connection between UK and Norway.	1400MW increase of NTC; RES integration; diversity of supply: connection between a hydro and a thermal power system.	under consideration	2017/2020	
424b	North Sea	Triton Knoll (UK)		Establish new 400kV double busbar collector substation.	Provision for additional wind capacity from the North Sea.	RES integration.	under consideration	2018	
424c	North Sea	Triton Knoll (UK)	Bicker Fenn (UK)	New 400kV double circuit.	Limit to renewable export.	Reduce congestion.	under consideration	2018	
424d	North Sea	Near Triton Knoll (UK)		Establish new 400kV double busbar collector substation.	Provision for additional wind capacity from the North Sea.	RES integration.	under consideration	2018	
424e	North Sea	Triton Knoll (UK)	Walpole (UK)	New 400kV double circuit.	Limit to renewable export.	Reduce congestion.	under consideration	2018	
424f	North Sea	Triton Knoll (UK)	Grimsby West (UK)	New 400kV double circuit.	Limit to renewable export.	RES integration.	under consultation	2019	
424g	North Sea	Bicker Fenn (UK)	Near Bainton (UK)	New 400kV double circuit.	Limit to renewable export.	RES integration.	under consideration	2018	
424h	North Sea	Near Bainton (UK)		Establish new 400kV double busbar substation.	Limit to renewable export.	RES integration.	under consideration	2018	
424i	North Sea	Killinghome South (UK)		Establish new 400kV double busbar substation and construct new 400kV double circuit to Grimsby West.	Limit to renewable export.	RES integration.	under consideration	2020	

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424j	North Sea	Bramford (UK)	Twinstead(UK)	New 400kV double circuit.	Limit to renewable and nuclear export.	Reduce congestion.	under consideration	2017	
425	Baltic Sea North Sea	Feda (NO)	to be determined (NL)	NorNed 2: a 2nd HVDC connection between Norway and The Netherlands via 570km 450kV DC subsea cable with 700 - 1400MW capacity.	Need to increase the current transfer capacity between both countries.	700-1400MW increase of NTC; RES integration; diversity of supply: connection between a hydro and a thermal power system.	under consideration	2015/2017	
426	Baltic Sea North Sea	Kristiansand (DK)	Tjele (NO)	Skagerak 4: 4th HVDC connection between Southern Norway and Western Denmark, built in parallel with the existing 3 HVDC cables; new 700MW including 230km 500kV DC subsea cable.	Need to increase the current HV transfer capacity between both countries.	700 MW increase of NTC ; Diversity of supply: connection between a hydro and a thermal power system. Enabling increased RES integration.	design & permitting	2014	X
427	Baltic Sea North Sea	Endrup (DK)	Eemshaven (NL)	COBRA: New single circuit HVDC connection between Jutland and the Netherlands via 350km subsea cable; the DC voltage will be up to 450kV and the capacity 600-700MW.	Need to increase the current transfer capacity between both countries.	Increase of NTC ; improved security of supply; RES integration ; 600-700MW ; The purpose of the link is to allow for the exchange and integration of wind energy and increase the value of renewable energy into the Dutch and Danish power systems and to increase security of supply.	design & permitting	2016	
428	Baltic Sea North Sea	Kassø (DK)	Tjele (DK)	Rebuilding of a 400kV OHL of 173km from a single-circuit to a double-circuit . This increases the transfer capacity with approx 1000 MW.	Need for increased capacity Norway-Jutland-Germany.	1000MW increase of NTC; RES integration.	design & permitting	2012/2014	
429	Baltic Sea North Sea	Ferslev (DK)	Vester Hassing (DK)	New 20km single circuit 400kV line via a cable with a capacity of approx 800 MW.	Need for improving the ability to transport Læsø off-shore wind power in N-1 security conditions.	RES integration ; improved security of supply.	Planned	2018	
430	Baltic Sea North Sea	Revsing (DK)	Landerupgård (DK)	New 18km single circuit 400kV line via cable with capacity of approx. 1200 MW.	Need for transporting wind power from the West Coast to the consumption centre on the East Coast.	RES integration; improved security of supply.	Planned	2017	
431	Baltic Sea North Sea	Tjele (DK)	Trige (DK)	New 46km single circuit 400kV line via cable with capacity of approx. 1200 MW.	Need for transporting wind power from the West Coast to the consumption centre on the East Coast.	RES integration; improved security of supply.	Planned	2017	

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432	Baltic Sea North Sea	Asvæsværket ((DK)	Kyndbyværket (DK)	New 60km single circuit 400kV line via cable with capacity of approx. 1200 MW.	Need for reinforcing and meshing the 400kV grid on Zealand.	Improved security of supply.	Planned	2014	
433	Baltic Sea North Sea	Glentegård (DK)	Amagerværket & H.C. Ørstedværket (DK)	New 22km single circuit 400kV line via cable with capacity of approx. 1200MW.	Creating a 400kV ring around Copenhagen.	Improved security of supply.	Planned	2016	
434	Baltic Sea North Sea	Fraugde (DK)	Herslev(DK)	New single circuit HVDC-LCC installation including a 56km 450kV DC subsea cable with 600MW capacity.	Need for interconnection between Eastern and Western Denmark to exchange wind power & regulation power.	Improved security of supply; RES integration.	under construction	2010	
435	Baltic Sea North Sea	Endrup (DK)	Revsing(DK)	Upgrade of 50km double-circuit 400kV OHL to reach a capacity of approx. 2000MW.	Need to connect COBRA line; improve n-1 security; need to increase transport capacity between West coast to East coast.	RES integration; improved security of supply.	Planned	2017	
436	Baltic Sea North Sea	Idomlund (DK)	Tjele (DK)	New 74km single circuit 400kV line via cable with capacity of approx. 1200MW.	Need for a second 400kV connection to Idomlund for security of supply and to evacuate wind power from Western Jutland.	RES integration; improved security of supply.	under consideration	2018/2020	
437	North Sea	Grain (UK)	Maasvlakte (NL)	New 1290MW HVDC bipolar installation including 260km of 450kV DC subsea cable.	Currently there is no connection between UK and Netherlands.	Project results in 1000MW NTC between both countries; enhanced diversity and security of supply for both markets open access for all market parties by explicit auction and market coupling increase of interconnection capacity and market transparency.	under construction	2010	X
438	North Sea	Eemshaven (NL)	Diemen (NL)	New 175-200km AC overhead line with capacity of 2x2650 MVA of 380kV.	need for connection from the generation locations in the vicinity of Eemshaven to the Dutch 380kV central ring.	Conventional generation integration; RES integration.	design & permitting	2016	
439	North Sea	Borssele (NL)	Geertruidenberg (NL)	New 100-130km double-circuit 380kV OHL with 2x2650 MVA capacity.	Need for connection from the generation locations in the vicinity of Borssele to the Dutch 380kV central ring.	Conventional generation integration; RES integration.	design & permitting	2014	
440	North Sea	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.	Need for connection from the generation locations in the vicinity of Rotterdam and Amsterdam to the Dutch 380kV central ring.	Conventional generation integration; feed of load increase; RES integration.	under construction	2013	

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441	North Sea	Zwolle (NL)	Hengelo (NL)	Upgrade of the capacity of the existing 60km double circuit 380kV OHL to reach a capacity of 2x2650 MVA.	Need to increase the capacity of the existing line to avoid overloads due to different flow patterns in the grid.	Improved security of supply; conventional generation integration; RES integration.	under consideration	tbd	
442	North Sea	Krimpen aan de IJssel (NL)	Maasbracht (NL)	Upgrade of the capacity of the existing 150km double circuit 380kV OHL to reach a capacity of 2x2650 MVA.	Need to increase the capacity of the existing line to avoid overloads due to different flow patterns in the grid.	Improved security of supply; conventional generation integration; RES integration.	under consideration	tbd	
443	North Sea	Richborough (UK)	Zeebrugge (BE)	Nemo project: new DC sea link including 135km of 250kV DC subsea cable with 1000MW capacity.	Currently there is no connection between BE and UK.	Increase of NTC by 1000MW.	planned	2016	
444	North Sea	Zomergem (BE)	Zeebrugge (BE)	New approx 50km double-circuit 380kV 5000MVA OHL line between Zomergem and Zeebrugge to evacuate the locally (offshore) produced power line.	Required to further realise the renewable offshore resources available to Belgium.	RES integration; Increase of NTC.	design & permitting	2014	
445	North Sea	Zandvliet (BE)	Lillo (BE)	Doubling of the axis Zandvliet-Mercator via Lillo by erecting a new 35km 380kV double circuit OHL with 1500 MVA capacity.	Needed to avoid overloading of the line during certain contingencies as a result of new generation and increasing demand.	Conventional generation integration; improved security of supply; Increase of NTC.	design & permitting	2014	
445a	North Sea	Gramme (BE)	Van Eyck (BE)	Doubling of 380kV the axis Gramme-Van Eyck.	Increase of NTC and connection of new generation units.	Market integration and power plants connection.	planned	2014	
446	North Sea	Bascharage (LU)	Aubange (BE)	New interconnection between Creos grid in LU and ELIA grid in BE via a 16km double circuit 225kV underground cable with a capacity of 1000 MVA.	Grid studies promote a new interconnection in the south of the grid line for improving security of supply.	Improved security of supply; Increase of NTC; Diversity of supply; new capacity between LU and BE.	design & permitting	2013	
447	North Sea	Heisdorf (LU)	Berchem (LU)	New 20km double-circuit mixed (underground cable+OHL) 225kV project with 1000 MVA capacity including substations for infeed in lower voltage levels.	Need for increased infeed to lower voltage levels, the project will also close a mesh in the south of the grid.	Improved security of supply; Increase of NTC.	design & permitting	2012/2020	
448	North Sea	Thames estuary (UK)		Double-circuit 400kV line upgrade around the Thames estuary.	Low cross border capacity.	Increase of NTC (investment needed to accommodate additional interconnectors and integrate offshore RES).	under construction	2011	
449	North Sea	Richborough (UK)	Canterbury (UK)	New double-circuit 400kV OHL and new 400kV substation in Richborough.	Low cross border capacity.	Increase of NTC (investment needed to accommodate additional interconnectors).	planned	2019	
449a	North Sea	Gravir (UK)	Beaulieu (UK)	Western Isles link. New 450MW HVDC link, +/- 150kV. Route length 156km (80km subsea, 76km onshore underground cable).	Limit to renewable export.	RES integration & reduced reliance on diesel generation.	design & permitting	2013	
450	North Sea	Sellindge (UK)	Dungeness (UK)	Reconductoring existing double-circuit 400kV OHL.	Low cross border capacity.	Increase of NTC (investment needed to accommodate additional interconnectors).	planned	2019	

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450a	North Sea	Kergord and Caithness (UK)	Blackhillock (UK)	The Moray Firth HVDC development - Shetland and Caithness links with offshore HVDC hub. Three ended HVDC link, 2 x 600MW legs and common 1200MW leg. Total route length 395km.	Limit to renewable export.	RES integration.	design & permitting	2014	
451	North Sea	Rowdown (UK)		New 400kV quadboosters.	Low cross border capacity.	Increase of NTC (investment needed to accommodate additional interconnectors).	planned	2019	
451a	North Sea	Dounreay (UK)	Beaully (UK)	String a second 275kV OHL circuit on existing towers.	Limit to renewable export.	RES integration.	design & permitting	2012	
452	North Sea	Deeside (UK)	Hunterston (UK)	New 2000MW HVDC link via 360km 500kV DC subsea cable on the West coast of the UK and new 400kV substation in Deeside - CSC Technology.	Limit to renewable export.	RES integration.	planned	2015	
452a	North Sea	Beaully (UK)	Kintore (UK)	Reconductor existing 275kV overhead line route.	Limit to renewable export.	RES integration.	design & permitting	2014	
453	North Sea	Peterhead (UK)	Hawthorn Pit (UK)	New 1800MW HVDC link via 365km 500kV DC subsea cable on the East coast of the UK and new 400kV substation in Hawthorn Pit - CSC Technology.	Limit to renewable export.	RES integration.	planned	2018	
453a	North Sea	Blackhillock (UK)	Kincardine (UK)	Reinsulate existing 275kV route for 400kV operation and establish three new 400kV substations en-route.	Limit to renewable export.	RES integration.	design & permitting	2015	
454	North Sea	Hawthorn Pit (UK)	Norton (UK)	Upgrade of double circuit OHL from 275 to 400kV.	Limit to renewable export.	RES integration.	planned	2018	
455	North Sea	Beaully (UK)	Denny (UK)	New double circuit 400kV OHL (220km) with new terminal substations and substation extensions en route.	Limit to renewable export.	RES integration.	under construction	2014	
456	North Sea	Harker (UK)	Hutton (UK)	Upgrade to double-circuit Harker - Hutton 400kV OHL.	Limit to renewable export.	RES integration.	planned	2013	
456b	North Sea	Harker(UK)	Quernmore(UK)	New 400kV double circuit.	Limit to renewable and nuclear export .	Reduce congestion.	under consideration	2020	
456c	North Sea	Quernmore(UK)	Padiham(UK)	New 400kV double circuit.	Limit to renewable and nuclear export.	Reduce congestion.	under consideration	2020	
457	North Sea	Harker (UK)	Stella (UK)	New 400kV series compensation at a number of locations across the Anglo-Scottish border.	Limit to renewable export.	RES integration.	planned	2014	
458	North Sea	Hinkley (UK)	Seabank (UK)	New 60km double-circuit 400kV overhead line for renewables off the South West peninsula, replanting of Hinkley Point nuclear power station and further CCGT at Seabank.	Integration of nuclear plant and limit to renewable export.	RES and conventional integration.	design & permitting	2016	

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459	North Sea	New substation (UK)	Ironbridge (UK)	New 400kV substation and 85km line to connect the TAN-08 wind farms in mid Wales.	Limit to renewable export.	RES integration.	design & permitting	2016	
459b	North Sea	Wylfa (UK)	Central Wales (UK)	New HVDC (VSC) bipolar interconnection.	Limit to renewable export.	RES integration.	under consideration	>2020	
460	North Sea	Pentir (UK)	Trawsfynydd (UK)	Upgrade of existing 48km single circuit 400kV line to double circuit to accommodate new wind generation off Anglesey and nuclear replanting at Wylfa.	Integration of nuclear plant and limit to renewable export.	RES and conventional integration.	under consideration	2015	
460b	North Sea	Wylfa(UK)	Pentir(UK)	New 400kV double circuit to connect offshore wind.	Limit to renewable export.	RES integration.	under consideration	2017	
461	North Sea	Woodland (IE)	Deeside (UK)	A new 260km HVDC (380kV DC) underground and subsea connection between Ireland and Britain with 500MW capacity. On the Irish side, a 45km direct current underground cable will be built to the Woodland substation where the VSC converter station will be placed. The link will consist of two identical circuits.	Future generation import and export to and from Ireland respectively.	RES integration; improved security of supply; diversity of supply. The project will enhance market opportunities and benefit competition.	under construction	2011	X
462	North Sea	Moyhill (IE)	Turleenan (UK)	A new 80km single circuit 400kV 1500MVA OHL from a new Moyhill 400/220kV substation in Ireland to a new Turleenan 400/275kV substation in Northern Ireland. This project is an integral part of the new interconnection project Moyhill- Woodland between Ireland and Northern Ireland.	Low cross border capacity.	Increase of NTC up to 1000MW NTC from IE to NI (today <450MW); improved security of supply; improved access for renewable generation.	design & permitting	2012	X
463	North Sea	IE (substation to be determined)	UK (substation to be determined)	Strengthening of EHV networks (partial uprate and new) into Donegal and West of Northern Ireland and enhanced links between the two systems.	This project needs to be completed to facilitate the development of renewable energy in the North-West and Border Regions.	RES integration; improved security of supply; Annual losses reduction.	under consideration	>2015	
464	North Sea	Moyhill (IE)	Woodland (IE)	A new 60km single circuit 400kV 1500MVA OHL from Woodland station north of Dublin up to a new Moyhill 400/220kV station in Co. Meath. This project together with Moyhill-Turleenan constitute the new interconnection project between Ireland and Northern Ireland.	Low cross border capacity.	Increase of NTC up to 1000 MW NTC from IE to NI (today <450MW); improved security of supply; improve access for renewable generation.	design & permitting	2012	X
465	North Sea	Loughteeog (IE)		A new 500 MVA 400/110kV substation connected into the Moneypoint-Dunstown 400kV line and the Athy-Portlaoise 110kV line, and with two 400/110kV 250 MVA transformers. This project also comprises a new 110kV line from Loughteeog to Ballyragget 38kV station and upgrading of Ballyragget station and the Ballyragget-Kilkenny 38kV line from 38kV to 110kV substation.	Demand growth at Kilkenny city and surrounding region.	Improved security of supply for counties Kilkenny, Carlow and Laois; reduce losses.	design & permitting	2014	
466	North Sea	Flagford (IE)	Srananagh (IE)	The construction of a new 55km single circuit 220kV line connecting the existing Flagford 220/100kV station to a new Srananagh 220/110kV station.	This development is needed to reinforce the network in the North-West area by supporting the voltage and reducing the risk of loss of supply during the winter peaks and the summer maintenance outages. This project will help alleviate constraints on the network in the South-West Region.	Improved security of supply; RES integration; reduce Losses.	under construction	2011	

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467	North Sea	Moneypoint (IE)	Tarbert or Kilpaddoge (IE)	A new 10km single circuit 220kV 500MVA (underground+subsea) cable constructed across the River Shannon Estuary from Moneypoint in Co. Clare to Tarbert or a new Kilpaddoge station in Co. Kerry. A new 400/220kV transformer at Moneypoint station is included in this project.	This project will provide an alternative route to import to or export power from the south West.	Improved security of supply; RES integration; Reduce Losses.	planned	2012	
468	North Sea	South-West Substation tbd (IE)	Mid-West Substation tbd (IE)	Increased capacity between the South-West and the Mid-West regions.	This new circuit is required to facilitate the evacuation of generation from the South-West region. This project will help alleviate constraints on the network in the South-West Region.	RES integration; improved security of supply; Reduce Losses.	under consideration	tbd	
469	North Sea	South-West Substation tbd (IE)	Mid-East Substation tbd (IE)	Increased capacity between the South-West and the Mid-East regions.	This new development is required to facilitate the evacuation of generation from the south-West region. This project will help alleviate constraints on the network in the South-West Region.	RES integration; improved security of supply; Reduce Losses.	under consideration	tbd	
470	North Sea	Mayo Substation tbd (IE)	Mid-East Substation tbd (IE)	The construction of new EHV transmission circuit(s) from north West Mayo to the EHV system.	This circuit(s) will facilitate the evacuation of generation from the North-West Region towards the main load centre in the East.	RES integration; improved security of supply; Reduce Losses.	under consideration	tbd	
471	North Sea	Dunstown (IE)	Woodland (IE)	Uprate of the 62-km single circuit 400-kV line between the Dunstown and Woodland stations for increasing the capacity	Following the construction of this circuit, large quantities of generation can be transferred through the Mid-East Region without having to pass through the Dublin city system.	Improve security of supply; Conventional generation integration; RES integration;	under consideration	tbd	

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TEN support for studies concerning: Lada-Velilla, Boimente-Narcea, Soto-Penagos, Penagos-Gueñes and Gueñes-Ichaso, Santurce evacuation
TEN: La Serna-Magallon

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Comments
European Coordinator Mr. Mario Monti appointed by DG TREN. There is a political agreement on the proposed solution.

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Comments
This project is the consequence of the 2006 cancellation of the permit for a new 400 kV OHL between Boutre and Broc-Carros.
This project complements Project 50 just above; needs DSM measures and new generation units in order to be fully efficient.

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Comments
connection of a customer

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Comments
Common agreement between IT and SI TSOs
Merchant line

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Comments

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Comments
conversion of the existing 220 kV double circuit line Krajinik (PSE Operator) - Vierraden (5 Hertz Transmission) into a 400 kV line is a top priority project according to German act for acceleration of transmission grid extension (EnLAG)
Top priority project according to German act for acceleration of transmission grid extension (EnLAG); German-Polish project development company is in preparation
http://www.energinet.dk/en/menu/Transmission/New+projects/New+electricity+transmission+installations/Kriegers+Flak/

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Comments
A similar non-TSO project "NorGer" is also under development
In parallel with this project there is a proposal for a new merchant line NorGer.
EnLAG (German Law for new lines)
EnLAG (German Law for new lines)
Due to the German act "EnLAG"

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Due to the German act "EnLAG"
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Comments
EnLAG (German Law for new lines)
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EnLAG (German Law for new lines)

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Comments
Top priority project according to German act for acceleration of transmission grid extension (EnLAG)
Top priority project according to German act for acceleration of transmission grid extension (EnLAG)
Top priority project according to German act for acceleration of transmission grid extension (EnLAG); project is also part of the European Energy Programme for Recovery
option for an interconnection project between Germany, Denmark and Sweden via offshore wind farms Kriegers Flak is part of the European Energy Programme for Recovery

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Comments
Top priority project according to German act for acceleration of transmission grid extension (EnLAG)
Suitable project extension under consideration of ongoing long term system studies.

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Comments
signed contract between governments of Italy and Montenegro regarding construction of the AC interconnector IT/ME
signed contract between governments of Italy and Montenegro regarding construction of the AC interconnector IT/ME

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Comments
Decision regarding funding from BIDSF is expected in following months.
The project is associated to the new Slovak - Hungarian interconnection from Gabčíkovo substation (see project 214).

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Comments
<p>necessary documentation is under preparation</p>
<p>Project is the part of the big project of Latvian grid reinforcement (Kurzeme Ring). This project is strong reinforcement of Riga transmission network, security of supply increasing and start connection point to Kurzeme Ring</p>

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Comments
The project will be part of a future/potential "Arctic Circle", including reinforcements in Finland, Sweden and Norway.

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Comments
<p>Seen as an extension of the new HVDC cables (142, 424, 425, 426).</p>
<p>Seen as an extension of the new HVDC cables (142, 424, 425, 426).</p>
<p>Seen as an extension of the new HVDC cables (142, 424, 425, 426).</p>
<p>Seen as an extension of the new HVDC cables (142, 424, 425, 426).</p>

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Comments
Seen as an extension of the new HVDC cables (142, 424, 425, 426).

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http://www.energinet.dk/en/menu/Transmission/New+projects/New+electricity+transmission+installations/Cable+action+plan/Cable+action+plan.htm
http://www.energinet.dk/en/menu/Transmission/New+projects/New+electricity+transmission+installations/Cable+action+plan/Cable+action+plan.htm
<p>commissioned in 2010 but commercial operation as from 2011</p>

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Comments
EC grant of €74m awarded to SHETL under the European Energy Programme for Recovery. Grant relates to the offshore hub element and rating increase to 1200MW.

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Comments