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-Technical information on Projects of Common Interest

accompanying the Commission Delegated Regulation (EU) 2016/89 of 18 November 2015 amending Regulation (EU) 347/2013 of the European Parliament and of the Council on guidelines for trans-European energy infrastructure as regards the Union list of projects of common interest

1. Priority Corridor Northern Seas Offshore Grid ('NSOG')

Integration of offshore renewable energy sources and accommodation of flows

No	TYNDP reference	Definition in Delegated Act	Details on location	Promoter(s)	Type / technology employed	Implementation status	Date of commissioning
1.3	.	Cluster Denmark—Germany including the following PCIs:					
	183-1018	**1.3.1** Interconnection between Endrup (DK) and Niebüll (DE)*	**1.3.1** Endrup (DK) to Klixbüll (in the vicinity of Niebüll) (DE)	**1.3.1** TenneT TSO GmbH (DE) Energinet.dk (DK)	**1.3.1** New 380 kV AC lines (OHL) of about 92 km (80 km in Denmark and 12 km in Germany) and new 380 kV-substations for integration of the available and further forecasted onshore wind in Schleswig-Holstein.	**1.3.1** in permitting	**1.3.1** 2022
	258-667	**1.3.2** Internal line between Brunsbüttel and Niebüll (DE)*	**1.3.2** Brunsbüttel (DE) and Klixbüll in the vicinity of Niebüll) (DE)	**1.3.2** TenneT TSO GmbH (DE)	**1.3.2** New 380-kV-line Brunsbüttel – Klixbüll (in the vicinity of Niebüll) insid e Schlesw ig – Holstein (~120 km). Main focus of the project is the integration of onshore -RES – mainly wind – in Western Schlesig-Holstein. It is the southbound connection of PCI 1.3.1. and is necessary to increase the GTC between Denmark/West and Germany by 500 MW	**1.3.2** Under construction	**1.3.2** 2019
1.4		Cluster Denmark—Germany including the following PCIs:					
	39-144	**1.4.1** Interconnection between Kassø (DK) and Audorf (DE) *	**1.4.1** Kassø (DK) to Audorf (DE)	**1.4.1** TenneT TSO GmbH (DE) Energinet.dk (DK)	**1.4.1** Upgrade of existing 220kV AC line to 400 kV thus building a new 400kV route from Denmark to Germany.	**1.4.1** Under construction	**1.4.1** 2020
	251-148	**1.4.2** Internal line between Audorf and Hamburg/Nord (DE)*	**1.4.2** Audorf to Hamburg/Nord (DE)	**1.4.2** TenneT TSO GmbH (DE)	**1.4.2** New 380kV AC double circuit line (OHL) Audorf - Hamburg/Nord in existing 220kV corridor, Main focus of the proje ct is the inte gration of onshore -RES – m ainly wind – in Schleswig-Holst in.It is the southbound connection of PCI 1.4.1. and is necessary to increase the GTC between Denmark /West and Germany by 720/1000 MW.	**1.4.2** Under construction	**1.4.2** 2017

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	251-147	**1.4.3** Internal line between Hamburg/Nord and Dollern (DE)*	**1.4.3** Hamburg/Nord (DE) and Dollern (DE)	**1.4.3** TenneT TSO GmbH (DE)	**1.4.3** New 380kV AC double circuit line (OHL) between Hamburg/Nord –Dollern, including 2 new 400/220kV transformers in substation Hamburg/Nord (of 50Hertz Transmission) and new 400kV switchgear in Kummerfeld.	**1.4.3** Under construction	**1.4.3** 2018
1.8	37-142	**1.8.** Cluster Germany — Norway [currently known as "NordLink"]					
		1.8.1 Interconnection between Wilster (DE) and Tonstad (NO) *	**1.8.1** Tonstad / Ertsmyra substation (NO) to Wilster (DE)	**1.8.1** Statnett SF (NO) TenneT TSO GmbH, KfW (DE)	**1.8.1** A new HVDC subsea cable of 525 kV, 514 km and with a capacity of 1400 MW between Southern Norway and Northern Germany ((total length onshore and offshore 623 km)).	**1.8.1** Under construction	**1.8.1** 2020
	37.406	**1.8.2** Reinforcement of internal lines in southern Norway*	**1.8.2** Southern Norway (NO)	**1.8.2** Statnett SF (NO)	**1.8.2** Voltage uprating of existing 300 kV line Sauda/Saurdal - Lyse - Tonstad - Feda - 1&2, Feda - Kristiansand; Sauda-Samnanger in long term. Voltage upgrading of existing single circuit 400kV OHL Tonstad-Solhom-Arendal. Reactive power devices in 400kV substation	**1.8.2** Under construction	**1.8.2** 2019-2021
1.10		Cluster United Kingdom—Norway interconnections, including one or more of the following PCIs:					
	110-424	**1.10.1** Interconnection between Blythe (UK) and Kvilldal (NO) [currently known as "North Sea Link"]*	**1.10.1** Blythe (UK) to Kvilldal (NO)	**1.10.1** Statnett SF (NO) National Grid Interconnector Holdings Limited (UK)	**1.10.1** A new HVDC subsea interconnection with a capacity of 1400 MW between Norway and the United Kingdom.	**1.10.1** Under construction	**1.10.1** 2021
	190-1382	**1.10.2** Interconnection between Peterhead (UK) and Simadalen (NO) [currently known as "NorthConnect"]*	**1.10.2** Peterhead (UK) to Simadalen (NO)	**1.10.2** NorthConnect KS (UK)	**1.10.2** A new subsea HVDC interconnection with a capacity of 1400 MW between Norway and the United Kingdom	**1.10.2** Permitting	**1.10.2** 2022
1.13	214-1082	**1.13** Interconnection between Iceland and United Kingdom [currently known as "Ice Link"]*	**1.13** Iceland to UK	**1.13** National Grid Interconnector Holdings Limited (UK) Landsnet hf (IC) Landsvirkjun (IC)	**1.13** A new HVDC subsea cable of approximately 1000 km and with a capacity of approximately 800-1200 MW between the UK and Iceland (onshore and offshore), Further details of technology and voltage to be fixed at a later stage.	**1.13** Under consideration	**1.13** 2027

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Achieving the 2020 &2030 interconnection targets and increasing market integration

1.1		Cluster Belgium — United Kingdom [currently known as "NEMO"], including the following PCIs:					
	74-443	**1.1.1** Interconnection between Gezelle (BE) and the vicinity of Richborough (UK)*	**1.1.1** Gezelle (BE) – Richborough (UK)	**1.1.1** Nemo Link Limited	**1.1.1** New DC sea link including 130 km of DC subsea cable with 1000 MW capacity between Richborough and Gezelle (vicinity of Zeebrugge) (offshore + onshore)	**1.1.1** Under construction	**1.1.1** technical commissioning 2019 with operation in 2019
	74-449	**1.1.2** Internal line between the vicinity of Richborough and Canterbury (UK)	**1.1.2** Vicinity of Richborough to Canterbury (UK)	**1.1.2** National Grid Electricity Transmission plc (UK)	**1.1.2** New 400kV substation in Richborough and new 400kV AC double circuit OHL between Richborough and Canterbury (onshore)	**1.1.2** Permitting	**1.1.2** 2018

1.6	107-810	**1.6** France — Ireland interconnection between La Martyre (FR) and Knockraha (IE) [currently known as "Celtic Interconnector"]*	**1.6.** Brittany, most probably La Martyre (FR) to future 400 kV substation at Knockraha (IE)	**1.6.** EirGrid plc (IE) Réseau de Transport d'Electricité /RTE (FR)	**1.6.** A new 320 kV – 500 kV (depending on the technology, to be fixed at a later stage in detailed design studies) HVDC (VSC) subsea connection of approximately 600 km and with a capacity of around 700 MW between Ireland and France (offshore).	**1.6** Under consideration	**1.6** 2026

1.7		Cluster France — United Kingdom interconnections, including one or more of the following PCIs:					
	153-987	**1.7.1** Interconnection between Cotentin (FR) and the vicinity of Exeter (UK) [currently known as FAB project]*	**1.7.1** Cotentin (FR) to the vicinity of Exeter (UK)	**1.7.1** FABLink Ltd, a joint venture of Transmission Investment (UK) and Alderney Renewable Energy; Réseau de Transport d'Electricité / RTE (FR)	**1.7.1** Two 220km HVDC Links with a capacity of 700MW each between France, Britain via the island of Alderney, using Voltage Source Converters in balanced monopole configuration with XLPE or MI cables -	**1.7.1** Permitting	**1.7.1** 2021
	25-62	**1.7.2** Interconnection between Tourbe (FR) and Chilling (UK) [currently known as "IFA2" project] *	**1.7.2** Caen area, most likely Tourbe (FR) to Chilling (UK)	**1.7.2** National Grid Interconnector Holdings Limited (UK) Réseau de Transport d'Electricité/RTE (FR)	**1.7.2** New subsea 320 kV – 390kV HVDC link with a capacity of around 1000 MW (depending on technology to be fixed at a later stage in detailed specification and competitive procurement processes) between the UK and France (offshore).	**1.7.2** Under construction	**1.7.2** 2020

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	172-1005 (1388)	**1.7.3** France — United Kingdom interconnection between Coquelles (FR) and Folkestone (UK) [currently known as "ElecLink" project]*	**1.7.3** Coquelles (FR) to Folkestone (UK)	**1.7.3** ElecLink Limited	**1.7.3** A new 51 km 320 kV DC electricity interconnector with a capacity of 1000 MW between Coquelles and Folkestone, via the Channel Tunnel (onshore and offshore).	**1.7.3** Under Construction	**1.7.3** 2019
	247.1381	**1.7.4** Interconnection between Le Havre (FR) and Lovedean (UK) [currently known as "AQUIND"]*	**1.7.4 Barnabos (in the region of Le Havre) (FR) to Lovedean (UK)**	**1.7.4** Aquind Ltd	**1.7.4.** AQUIND Interconnector is a new 320kV HVDC (VSC) subsea and underground power transmission link between the United Kingdom and France with the total net capacity of 2000MW. The interconnector will connect to the GB grid at Lovedean substation in the South of England and to the French grid – at Barnabos substation in Normandy.	Planning	2020
	285.1383	**1.7.5** Interconnection between the vicinity of Dunkerque (FR) and the vicinity of Kingsnorth (UK) [currently known as "Gridlink"]*	**1.7.5** Dunkerque (FR) to the vicinity of Kingsnorth (UK)	**1.7.5** Elan Energy Ltd	**1.7.5** UK - France 1.5GW HVDC (VSC) Interconnector. The GridLink project is a 1.4GW HVDC (VSC) interconnector between the UK (Kingsnorth) and France (Warande)" Substations in Kemsley (Sittingbourne, UK) and Warande (Gravelines, France)	**1.7.5** Planning	**1.7.5** 2021
1.9	286.1385	**1.9.1** Ireland — United Kingdom interconnection between Wexford (IE) and Pembroke, Wales (UK) [currently known as "Greenlink"]	**1.9.1** Wexford (IE) to Pembroke, Wales (UK)	**1.9.1** Element Power Ireland Ltd Greenlink Interconnector Limited	**1.9.1** A 320KV subsea cable of 172KM and with a capacity of 500-700 MW between the south of Ireland and Wales.	**1.9.1** Planned, but not yet in permitting	**1.9.1** 2023
1.14	167-998	**1.14** Interconnection between Revsing (DK) and Bicker Fen (UK) [currently known as "Viking Link"]*	**1.14** Revsing (DK) to Bicker Fenn (UK)	**1.14** National Grid Interconnector Holdings Limited (UK) Energinet.dk (DK)	**1.14** A new HVDC subsea cable of 500 kV, approximately 740 km and with a capacity of up to 1400 MW between the UK and Denmark (onshore and offshore).	**1.14** Permitting	**1.14** 2022
1.15	121.934	**1.15** Interconnection between the Antwerp area (BE) and the vicinity of Kemsley (UK)*	**1.15** Between BE and UK	**1.15** Elia (BE) and National Grid Interconnector Holdings Limited (UK);	**1.15** This project considers the possibility of a ~ 1 - 1.4 second HVDC interconnector between UK and Belgium at the earliest by 2028 (indicative timing). The timing as well as location, routing, capacity are subject to further studies. In this context, Elia and NGIHL are conducting a bilateral feasibility study.	**1.15** Under Consideration	**1.15** 2028
1.16	260.1255	**1.16** Interconnection between Netherlands and United Kingdom*	**1.16** Netherlands to United Kingdom	**1.16** National Grid Interconnector	**1.16** This project considers the possibility of a second 1 GW HVDC connection, between UK and the	**1.16** Under consideration	**1.16** 2030

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				Holdings Limited (UK); TenneT TSO BV (NL)	Netherlands. The determination of the optimal capacity, location, technology, potentially needed internal grid reinforcements as well as possible synergies with the development of offshore capacity and the long-term concept of a "west-east corridor" in the North Sea area are subject of further studies		

Electricity Storage

1.12		Cluster of electricity storage facilities in United Kingdom, including one or more of the following PCIs:					
	1010	**1.12.1** Compressed air energy storage in Larne	**1.12.1** Larne, Northern Ireland (UK)	**1.12.1** Gasunie	**1.12.1** Compressed Air Energy Storage using air storage caverns to be developed in salt deposits. Storage Capacity 2GWh. Technical capability, per 24 hrs: 250 MW compression x 6 hrs, 330 MW generation x 6 hrs, 250 MW compression x 6 hrs, 330 MW generation x 6 hrs. Envisaged operation over 24 hrs = 250 MW compression 4-6 hrs; generation 70-330 MW over 6-10 hrs	**1.12.1** Planned, but not yet in permitting	**1.12.1** 2021
	1005	**1.12.2** Compressed air energy storage in Cheshire	**1.12.2** Cheshire (England, UK)	**1.12.2** Gasunie	**1.12.2** Compressed air energy storage using air storage caverns to be developed in salt deposits. Storage Capacity 1.608GWh . Technical capability, per 24 hrs: 230 MW compression x 6 hrs, 268 MW generation x 6 hrs, 230 MW compression x 6 hrs, 268 MW generation x 6 hrs. Envisaged operation over 24 hrs = 250 MW compression 4-6 hrs; generation 50-268 MW over 6-10 hrs	**1.12.2** Planned, but not yet in permitting	**1.12.2** 2022
	1022	**1.12. 3** Compressed air Renewable energy storage near Middlewich [currently known as "CARES"]	**1.12. 3** Middlewich (England, UK)	**1.12.3** Storelectric Ltd (UK)	**1.12.3** Transmission grid-scale energy storage innovative adiabatic Compressed Air Energy Storage (CAES) . . Storage Capacity 2.5 GWh. The installations of 500MW, 2.5-21GWh with zero or low emissions, operate at 68-70% round trip efficiency. Potential when rolled out Europe-wideto store the entire continent's energy requirements for over a week.	**1.12.3** Under construction	**1.12.3** 2026
	1015	**1.12.4** Hydro-pumped electricity storage at Cruachan II	**1.12.4** Argyll and Bute (Scotland, UK)	**1.12.4** Scottish Power (UK)	**1.12.4** The Cruachan II development is a reversible pumped-storage hydroelectric power station with capacity of 7.2 GWh and able to generate up to 600MWe. The project would sit adjacent to the existing Cruachan hydro-electric pumped storage generating station. Cruachan II would generate electricity, using water from an upper reservoir on Ben	**1.12.4** Under consideration	**1.12.4** 2025

*Double labelling as Electricity Highway

	1014	**1.12.5** Hydro-pumped electricity storage at Coire Glas	**1.12.5** Loch Lochy (Scotland, UK)	**1.12.5** SSE	Cruachan to drive the turbines. The turbines to be used at Cruachan II, would operate both as pumps and generators, which would be housed in a new cavern located within Ben Cruachan. **1.12.5** A pumped hydro station with up to 600MW generation capacity and a storage capacity of up to 30GWh. Bulk storage that which could be provided by Coire Glass pumped hydro station would enables saving in generation capacity of 19 - 24 Meuro/year	**1.12.5** Under consideration	**1.12.5** 2023

1.17	1013	**1.17** Compressed air energy storage in Zuidwending (NL)	**1.17** Zuidwending (NL)	**1.17** Gaelectric Energy Storage Ltd	**1.17** Compressed air energy storage using air storage caverns with 2.64 GWh of storage capacity is to be developed in salt deposits. Technical capability, per 24 hrs: 250 MW compression x 6 hrs, 330 MW generation x 6 hrs, 250 MW compression x 6 hrs, 330 MW generation x 6 hrs. Envisaged operation over 24 hrs = 250 MW compression 4-6 hrs; generation 70-330 MW over 6-10 hrs	**1.17** Under consideration	**1.17** 2021

1.18	1002	**1.18** Offshore hydro-pumped electricity storage facility in Belgium [currently known as "iLand"]	**1.18** an artificial island off the coast of Belgium (5 km offshore)(BE)	**1.18** THV iLand (BE)	**1.18** iLand consists in building an innovative hydro-pumped storage facility on an artificial island off the coast of Belgium (approximately 5 km offshore with an imprint of 4 x 2,5 km). iLand should provide a total hydraulic storage capacity of ca. 2,2 GWh, i.e., a total net storage capacity of 2,0 GWh, assuming a 90% efficiency in turbine-mode, and a net annual electricity generation of approximately 750 GWh.	**1.18** Under consideration	**1.18** 2021

1.1.3		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
1.2	N/A	No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
1.5		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
1.9.2		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
1.9.3		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
1.9.4		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
1.9.5		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
1.9.6		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
1.11.1		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
1.11.2		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
1.11.3		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
1.11.4		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A

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2. Priority Corridor North-South Electricity Interconnections in Western Europe ('NSI West Electricity')

Integration of renewable energy sources and accommodation of flows

No	TYNDP reference	Definition	Details on location	Promoter(s)	Type / technology employed	Implementation status	Date of commissioning
2.9	254-660	**2.9** Internal line between Osterath and Philippsburg (DE) to increase capacity at Western borders [currently known as "Ultranet"]	**2.9** Osterath to Philippsburg (DE)	**2.9** Amprion GmbH (DE) TransnetBW GmbH (DE)	**2.9** New 400 HVDC lines (OHL) with a length of 40 km and 300 km of existing routes with new technology and with a total capacity of 2 GW from Osterath to Philippsburg to integrate new wind generation especially from North/Baltic Sea towards Central-South for consumption and storage (onshore).	**2.9** Planned, but not yet in permitting	**2.9** 2021
2.10	235-664	**2.10** Internal line between Brunsbüttel-Groβgartach and Wilster-Grafenrheinfeld (DE) to increase capacity at Northern and Southern borders [currently known as "Suedlink"]*	**2.10** Brunsbüttel (DE) to Groβgartach (DE) and Wilster (DE) to area Grafenrheinfeld (DE)	**2.10** TenneT TSO GmbH (DE) TransnetBW GmbH (DE)	**2.10** New HVDC connection with a total capacity of 4 GW, with one line having a length according to the suggested corridor route of approx. 700 km and the other of 550 km, to integrate new wind generation from Northern Germany towards Southern Germany and Southern Europe for consumption and storage (onshore).	**2.10** Planned, but not yet in permitting	**2.10** 2025

Enhancing reliability and security of supply

2.2	92-146	**2.2.1** First Interconnection between Lixhe (BE) and Oberzier (DE) [currently known as "ALEGrO"]*	**2.2.1**Lixhe, Liège area (BE) to Oberzier, Aachen / Düren region (DE)	**2.2.1** Elia System Operator SA (BE), Amprion GmbH (DE)	**2.2.1** Connection between Lixhe (BE) and Oberzier (DE) including a new 90 km HVDC 1 GW underground cable (voltage: ±320kV) and the extension of existing 380 kV substations.	**2.2.1** Permitting	**2.2.1** 2020
	225.1107	**2.2.4** Second interconnection between Belgium and Germany *	**2.2.4** Between Germany and Belgium	**2.2.4** Elia System Operator SA (BE), Amprion GmbH (DE)	**2.2.4** 2nd interconnector BE-DE: envisions the possibility of a second ~ 1GW HVDC interconnection between Belgium and Germany at the earliest by 2028 (indicative timing). The exact timing as well as location, routing, capacity are subject to further studies. In this context, Elia and Amprion are conducting a bilateral feasibility study.	**2.2.4** Under consideration	**2.2.4** 2028
2.23	297-445, 604, 605	**2.23** Internal lines at the Belgian north border between Zandvliet and Lillo-Liefkenshoek (BE),and between Liefkenshoek and Mercator, including a substation in Lillo (BE)[currently known as "BRABO II + III"]	**2.23** In Northern Belgium close to the border with the Netherlands, in the district of Antwerp	**2.23** Elia System Operator SA (BE)	**2.23** BRABO II + III: realization of a new 380 kV corridor between Zandvliet and Mercator consisting of a double-circuit overhead line, including a new substation 380kV in Lillo	**2.23** Under construction (Brabo II) Permitting (Brabo III)	**2.23** 2020 (Brabo II) 2023 (Brabo III)

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2.24	236-608	**2.24** Internal Belgian Backbone West between Horta-Mercator (BE)	**2.24** Belgian North Border to the Netherlands	**2.24** Elia System Operator SA (BE)	**2.24** The project consists of replacing the conductors of the double circuit 380 kV overhead line between the substations of Horta and Mercator with high performance conductors, hereby doubling its transport capacity. The circuit currently passing Mercator going to Doel will be integrated into the Mercator substation to obtain a better flux balance and avoid an upgrade between Mercator and Doel at this stage.	**2.24** Under construction	**2.24** 2019

High Level Group project for achieving the 10% interconnection target and increasing market integration of the Iberian Peninsula with the rest of Europe

2.7	16-38	**2.7** Interconnection between Aquitaine (FR) and the Basque country (ES) [currently known as "Biscay Gulf"]*	**2.7** Nouvelle Aquitaine (FR) to the Basque Country (ES)	**2.7** RTE - Réseau de Transport d'Electricité (FR), REE - Red Eléctrica de España S.A. (ES)	**2.7** New 320 kV or 500 kV (voltage tbd) HVDC subsea cable interconnection of approximately 370 km with a capacity of 2000 MW (tbc) between Nouvelle Aquitaine and the Basque country, via the the Biscay Gulf (offshore).	**2.7** Permitting	**2.7** 2025

2.27	270.1211;1212;1214;1215	**2.27.1** Interconnection between Aragón (ES) and Atlantic Pyrenees (FR)	**2.27.1** Aragón (ES) to Marsillon in Atlantic Pyrenees (FR)	**2.27.1** REE - Red Eléctrica de España: S.A.U. (ES), RTE - Réseau de Transport d'Electricité (FR)	**2.27.1** A new interconnection between France and Spain in the Central part of the Pyrenees between Marsillon (France) and Aragon area (Spain). The project is considered as a HVDC project of 2x1000 MW. Internal reinforcements in Spain and France complement the cross border section.	**2.27.1** Planning	**2.27.1** 2026
	276.1206; 1207;1208; 1210	**2.27.2** Interconnection between Navarra (ES) and Landes (FR)	**2.27.2** Navarra (ES) and Landes (FR)	**2.27.2** REE - Red Eléctrica de España: S.A.U. (ES), RTE - Réseau de Transport d'Electricité (FR)	**2.27.2** A new interconnection between France and Spain in the Western part of the Pyrenees between Pamplona area (Spain) and Cantegrit (France). The project is considered as a HVDC project of 2x1000 MW. Internal reinforcements in Spain and France complement the crossborder section.	**2.27.2** Planning	**2.27.2** 2026

2.16	1-2	Cluster of internal lines, including the following PCIs:: **2.16.1** Internal line between Pedralva and Sobrado (PT), formerly designated Pedralva and Alfena (PT)	**2.16.1** North Portugal near Spanish border ; Pedralva (PT) – Sobrado (PT)	**2.16.1** REN - Rede Eléctrica Nacional S.A. (PT)	**2.16.1** New 67 km double circuit OHL Pedralva – (formerly designated Alfena) of 400 kV (initially with only one circuit installed), with a capacity of 1630/1860 MVA per circuit correspondent to summer/winter (onshore).	**2.16.1** Planned but not yet in permitting	**2.16.1** 2022-2023

*Double labelling as Electricity Highway

	1-4,474, 941	**2.16.3** Internal line between Vieira do Minho, Ribeira de Pena and Feira (PT), formerly designated Frades B, Ribeira de Pena and Feira (PT)	**2.16.3** North Portugal near Spanish border; V.Minho (by Ribeira de Pena and Fridão) - Feira; including Ribeira de Pena (PT) Substation	**2.16.3** REN - Rede Eléctrica Nacional S.A. (PT)	**2.16.3** New 132 km double circuit OHL 400 kV Vieira do Minho – Ribeira de Pena –Feira, along with the new substation of R. Pena. Capacity is 2x (1630/ 1860 MVA) (summer/winter) between Vieira do Minho and R. Pena, and 2080/2370 MVA (summer/winter) along R. Pena –Feira (onshore).	**2.16.3** Planned but not yet in permitting	**2.16.3** 2022-2024
2.17	4-18,496, 498,499, 500	**2.17** Portugal — Spain interconnection between Beariz — Fontefría (ES), Fontefria (ES) — Ponte de Lima (PT) (formerly Vila Fria / Viana do Castelo) and Ponte de Lima — Vila Nova de Famalicão (PT) (formerly Vila do Conde) (PT), including substations in Beariz (ES), Fontefría (ES) and Ponte de Lima (PT)	**2.17** Portugal — Spain interconnection between Beariz — Fontefría (ES), Fontefria (ES) — Ponte de Lima (PT)	**2.17** REN - Rede Eléctrica Nacional S.A. (PT), REE - Red Eléctrica de España S.A. (ES)	**2.17** New 400 kV AC double circuit (OHL) of 170 km (117 km in Portugal and 53 km in Spain) between Beariz (ES) - Fontefría (ES) - Ponte de Lima (PT) – Vila Nova de Famalicão(PT)), with only one circuit being installed on the Fontefría – Vila Nova de Famalicão section (onshore). New 400 kV substations Fontefría, Beariz, Ponte de Lima and Vila Nova de Famalicão. For the section between Vila Nova de Famalicão and Ponte de Lima it was expected to start construction in 2017, but it still awaits for permit clearance in order to start construction.	**2.17** Permitting	**2.17** 2019

Integration of the single electricity market with a growing share of renewables on the island of Ireland

2.13		Cluster Ireland — United Kingdom interconnections, including the following PCIs:					
	81-462	**2.13.1** Ireland — United Kingdom interconnection between Woodland (IE) and Turleenan (UK)*	**2.13.1** Woodland (IE) to Turleenan, Northern Ireland (UK)	**2.13.1** EirGrid; System Operator for Northern Ireland Ltd/SONI (UK)	**2.13.1** A new 400 kV AC single circuit (OHL) of 138 km and with a capacity of 1,500 MVA between Turleenan 400/275 kV in Northern Ireland (UK) to Woodland 400/220 kV (IE) (onshore).	**2.13.1** Permitting	**2.13.1** 2020
	82-463, 896, 897	**2.13.2** Ireland — United Kingdom Interconnection between Srananagh (IE) and Turleenan (UK)*	**2.13.2** Srananagh in Co. Sligo (IE) to Turleenan in Northern Ireland (UK)	**2.13.2** EirGrid plc; System Operator for Northern Ireland /SONI Ltd (UK)	**2.13.2** A new cross border circuit of approximately 200 km at 220kV or greater with a capacity up to 710MVA between Srananagh 220/110 kV station in Co. Sligo (IE) and Turleenan 400/275 kV station in Northern Ireland (UK).	**2.13.2** Planned, but not yet in permitting	**2.13.2** 2029

Reducing price differentials and enhancing market integration

2.5	21-55	**2.5.1** Interconnection between Grande Ile (FR) and Piossasco (IT) [currently known as Savoie-Piemont project]*	**2.5.1** Grande Ile (FR) to Piossasco (IT), via Frejus motorway tunnel	**2.5.1** Terna - Rete Elettrica Nazionale SpA (IT), RTE - Réseau de Transport d'Electricité (FR)	**2.5.1** New 190 km HVDC (VSC) interconnection between Grande Ile (FR) and Piossasco (IT) via a 320 kV underground cable and converter stations at both ends (two poles, each of them for a 600 MW power capacity). The cables will be laid in the security gallery of the Frejus motorway tunnel and mainly along the existing motorways.	**2.5.1** Under construction	**2.5.1** 2019

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2.14	174-1014	**2.14** Interconnection between Thusis/Sils (CH) and Verderio Inferiore (IT) [currently known as "Greenconnector"]	**2.14** Verderio Inferiore, near Milano (IT) to Thusis, Graubünden Canton (CH)	**2.14** Greenconnector	**2.14** A +/- 400 kV HVDC cable interconnector of 150 km (of which 47 km under Como lake) and with a capacity of 1000 MW (1200 MW continuous overload) between Verderio Inferiore, near Milano (IT) to Thusis, Graubünden Canton (CH) (onshore). Great part of the cables route will exploit a section of an existing oil pipeline, no longer in service since January 1997 and that crosses the Italian and Swiss border at Splügenpass and is running close by the two grid interconnection points of the Greenconnector project (Sils i.D. in Graubünden and Verderio Inferiore, Lecco).	**2.14** Permitting	**2.14** 2022

2.15	31-642	**2.15.1** Interconnection between Airolo (CH) and Baggio (IT)	**2.15.1** All'Acqua (CH) to Baggio (IT)	**2.15.1** Terna - Rete Elettrica Nazionale SpA (IT), Swissgrid (CH)	**2.15.1** A new DC/AC link (OHL) between Switzerland and Italy, connecting All'Acqua (CH), Pallanzeno (IT) and Baggio (IT) of about 160 km, including the following network items: - 400kV AC connection between All'Acqua (CH) and Pallanzeno (IT); - 300 kV ÷ 350 kV HVDC link between the new converter stations (AC to DC) of Pallanzeno (IT) and Baggio (IT)	**2.15.1** Permitting	**2.15.1** 2025

Improving reliability and security of supply

2.4	299*.1458	**2.4** Interconnection between Codrongianos (IT), Lucciana (Corsica, FR) and Suvereto (IT) [currently known as "SACOI 3"]	**2.4** Codrongianos (IT), Lucciana (Corsica, FR) and Suvereto (IT)	**2.4** Terna Rete Elettrica Nazionale S.p.A. (IT); EDF (FR)	**2.4** The project will replace the existing link (SACOI 2) close to the end of its lifetime. The project consists in a revamping of the HVDC link and new DC/AC converter stations in Corsica, Tuscany and Sardinia replacing the existing ones. The new HVDC converter stations will ensure an improvement in technological performance and an increase of the transmission capacity among the three areas involved.	**2.4** Design and permitting	**2.4** 2023

Electricity Storage

2.18	222	**2.18** Capacity increase of hydro-pumped storage in Austria — Kaunertal, Tyrol (AT)	**2.18** Location Austria / Tyrol / Kaunertal; Innt l/Ötztaler Alps - Connection point to transmission network : 220 kV Dis tribution Network der TINETZ -Tiroler Netze GmbH at UW Prutz..	**2.18** TIWAG-Tiroler Wasserkraft AG	**2.18** Total pump capacity (4 x Francis Type): 390 MW Storage capacity: : 64 GWh related to Versetz and 152 GWh related to Prutz 2. Expected net annual generation of storage function: 1,050 GWh/a Connection point to transmission infrastructure: Integration via DSO TINETZ (220 kV level) at UW Prutz and UW Westtirol as well as connection to TSO APG (380 kV level) at existing UW Westtirol and planned UW Prutz.	**2.18** Permitting	**2.18** 2034

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2.28	1011	**2.28.1** Hydro-pumped electricity storage Mont-Negre (ES)	**2.28.1** Mont-Negre (ES) is located at the Segre River (Mequinenza, Zaragoza)"	**2.28.1** Ingenieria Pontificia S.L.	**2.28.1** "MONT-NEGRE" is a reversible pumped-storage hydro-electric plant of 3300 MW power and storage capacity of 75.11 GWh The upper water pond (Mont-Negre), to be constructed, will have a capacity of 118Hm3 and a water surface of 330Has. The lower intake, will be located at the Segre River. The maximum height between the upper pond and the lower intake is 330m. There is an underground power plant fully equipped with medium voltage transformers, alternators and twelve turbines.	**2.28.1** Permitting	**2.28.1** 2020
	1012	**2.28.2** Hydro-pumped electricity storage Navaleo (ES)	**2.28.2** Navaleo – Leon (ES)	**2.28.2** CDR TREMOR S.L. (ES)	**2.28.2** P-PHES NAVALEO is pure pumped plant with an installed capàcity of 552 Mw. (3 x 184 Mw.) and total rated flow of 90 m3/s in generating mode and capacity of 548 Mw and flow of 70 m3/s in pumping mode, with an annual generation capacity between 700 - 1000 Gwh. The project consists in two reservoirs with a volume of 2,23 Mio m3. Normal static head is 710 m. The cycle efficiency is up to 79%.	**2.28.2** Permiting	**2.28.2** 2023
	1019	**2.28.3** Hydro-pumped electricity storage Girones & Raïmats (ES)	**2.28.3** Terres de l'Ebre, Tarragona (ES)	**2.28.3** Grupo Romero Polo	**2.83.3** The two Pumped Hydroelectric Storage stations, GIRONES & RAÏMATS of 3400 MW pumping and storage capacity of 34.9 GWh (34904 Mwh) will be build in two phases depending of the demand scenario. The total flow requested of 762 m3/s comes to pump the volume of water between the elevation 70 (normal maximum level of the Riba-roja's reservoir) and a decrease of 1.5 m over a period of 8 hours on continued operation.	**2.28.3** Under consideration	**2.28.3** 2024

2.2.2		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
2.2.3	N/A	No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
2.3.1		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
2.3.2		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
2.5.2		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
2.6		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
2.8		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
2.11.1		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
2.11.2		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
2.11.3		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
2.12		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A

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2.15.2		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
2.15.3		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
2.15.4		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
2.16.2		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
2.19		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
2.20		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
2.21		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
2.22		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
2.25.1		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
2.25.2		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
2.26		No longer considered a PCI	N/A	N/A	N/A	N/A	N/A

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3. Priority Corridor North-South Electricity Interconnections in Central Eastern and South Europe ('NSI East Electricity')

CESEC Electricity Priority Projects

3.7		Cluster Bulgaria — Greece between Maritsa East 1 and N. Santa and the necessary internal reinforcements in Bulgaria, including the following PCIs:					
	142-256	**3.7.1** Interconnection between Maritsa East 1 (BG) and N. Santa (EL)	**3.7.1** Maritsa East 1 (BG) to Nea Santa (EL)	**3.7.1** Elektroenergein Sistemen Operator EAD/ESO (BG) Interdependent transmission operator (IPTO)	**3.7.1** Construction of a new AC 400 kV single-circuit interconnector (OHL) between substation Maritsa East 1 (BG) and substation Nea Santa (EL) with a length of 151 km (122 km on Bulgarian territory and 29 km on Greek territory) and a capacity of 1500 MW2000 MVA (onshore).	**3.7.1** Permitting	**3.7.1** 2023
	142-257	**3.7.2** Internal line between Maritsa East 1 and Plovdiv (BG)	**3.7.2** Maritsa East 1 to Plovdiv (BG)	**3.7.2** EAD/ESO (BG)	**3.7.2** Construction of aA new AC 400kV line (OHL) between substation Maritsa East and substation Plovdiv with a length of 100 km and a capacity of 1500 MW 1700 MVA (onshore).	**3.7.2** Permitting	**3.7.2** 2020
	142-258	**3.7.3** Internal line between Maritsa East 1 and Maritsa East 3 (BG)	**3.7.3** Maritsa East 1 to Maritsa East 3 (BG)	**3.7.3** EAD/ESO (BG)	**3.7.3** Construction of a new AC 400kV line 400 kV AC line (OHL) between substation Maritsa East and switchyard of TPP Maritsa East 3 with a length ofof 13 km and with a capacity of 1500 MW 1700 MVA between Maritsa East 1 and Maritsa East 3 (onshore).(onshore).	**3.7.3** Permitting	**3.7.3** 2019
	142-262	**3.7.4** Internal line between Maritsa East 1 and Burgas (BG)	**3.7.4** Maritsa East 1 to Bourgas (BG)	**3.7.4** EAD/ESO (BG)	**3.7.4** Construction of a new AC 400kV line 400 kV AC line (OHL) between substation Maritsa East and substation Burgas with a length of 150 km and with a capacity of 1500 MW 1700 MVA between Maritsa East 1 and Bourgas (onshore).	**3.7.4** Permitting	**3.7.4** 2021

3.8		Cluster Bulgaria — Romania capacity increase [currently known as "Black Sea Corridor"], including the following PCIs:					
	138-800	**3.8.1** Internal line between Dobrudja and Burgas (BG)	**3.8.1** Dobrudja to Bourgas (BG)	**3.8.1** Electroenergien Sistemen Operator EAD/ESO (BG)	**3.8.1** Construction of a new AC 400kV AC single-circuit line (OHL) between substation Varna (Dobrudja) and substation Burgas with a length of 87 km and with a capacity of 1500 MW 1700 MVA connecting Dobrudja and Bourgas (onshore).	**3.8.1** Permitting	**3.8.1** 2021

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	138-273,715	**3.8.4** Internal line between Cernavoda and Stalpu (RO)	**3.8.4** Cernavoda (RO) to Stalpu (RO)	**3.8.4** C.N.T.E.E. TRANSELECTRICA S.A. (RO)	**3.8.4** A new 400 kV AC OHL double circuit of 159 km and with a capacity of 2x1380 MVA shall be built between the 400 kV substation Cernavoda and the existing 220/110 kV Stalpu substation, which shall be replaced with a 400/110 kV substation (onshore). One of the two circuits shall be connected in-out to the 400 kV substation Gura Ialomitei, situated in the vicinity of the new line.	**3.8.4** Permitting	**3.8.4** 2020
	138-275	**3.8.5** Internal line between Gutinas and Smardan (RO)	**3.8.5** Gutinas (RO) to Smardan (RO)	**3.8.5** C.N.T.E.E. TRANSELECTRICA S.A. (RO)	**3.8.5** A new 400 kV AC OHL double circuit (one circuit wired) of 137.5 km with a capacity of 1380 MVA shall be built between the existing 400 kV substations Gutinas and Smardan.	**3.8.5** Permitting	**3.8.5** 2020
3.9	141-223	**3.9.1** Interconnection between Žerjavenec (HR)/Hévíz (HU) and Cirkovce (SI)	**3.9.1** Cirkovce (SI) to Héviz (HU)/Žerjavinec (HR)	**3.9.1** Elektro Slovenija d. ELES d.o.o. (SI)	**3.9.1** Construction of a new 400 kV double circuit OHL, which will be connected to one circuit of the existing Hévíz (HU)-Žerjavinec (HR) double circuit 400kV OHL by erecting a new AC 80 km double circuit 400 kV OHL with a capacity of 2x1330 MVA in Slovenia. The project will result in two new cross-border circuits: Hévíz (HU) - Cirkovce (SI) and Cirkovce (SI) - Žerjavinec (HR) (onshore). The new line will be connected in a new 400 kV substation of Cirkovce (SI).	**3.9.1** Permitting	**3.9.1** 2019
3.16	48-214	**3.16.1** Interconnection between Gabčikovo (SK) — Gönyű (HU) and Veľký Ďur (SK)	**3.16.1** Gabčíkovo (SK) -Gönyű (HU) – Veľký Ďur (SK)	**3.16.1** MAVIR (HU), SEPS (SK)	**3.16.1** New AC 400 kV double circuit interconnection between the substations Gabčíkovo (SK) and Gönyű (HU) with one circuit connected to the substation Veľký Ďur (SK). The length of the interconnector is approximately 20 km with a total capacity of 2 772 MVA. Clusters 3.16 and 3.17 are co-dependent.	**3.16.1** Permitting	**3.16.1** 2020
3.17	48-695,696,697	**3.17** Interconnection Hungary – Slovakia between Sajóvánka (HU) and Rimavská Sobota (SK)	**3.17** Sajóivánka (HU) to Rimavská Sobota (SK)	**3.17** MAVIR (HU), SEPS (SK)	**3.17** Connection of the two existing substations R. Sobota (SK) and Sajóivánka (HU) by a new 400 kV AC double circuit line (preliminary armed only with one circuit) , with an approximate total length of 49 km and a capacity of 1386 MVA, including the installation of the necessary equipment at the R. Sobota (SK) substation and the installation of 2x70 Mvar shunt reactors and a second 400/120 kV transformer in the substation of Sajóivánka (HU). Clusters 3.16 and 3.17 are co-dependent.	**3.17** Permitting	**3.17** 2020

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3.22		Cluster Romania — Serbia [currently known as "Mid Continental East Corridor"] and Italy – Montenegro, including the following PCIs:					
	144-238	**3.22.1** Interconnection between Resita (RO) and Pancevo (RS)	**3.22.1** Resita (RO) to Pancevo (RS)	**3.22.1** C.N.T.E.E. TRANSELECTRICA S.A. (RO) Elektromreža Srbije (RS)	**3.22.1** New 400 kV AC double circuit OHL with a length of 131 km (63 km on RO side and 68 km on RS side) and with a capacity of 2x1380 MVA between substations Resita and Pancevo (onshore).	**3.22.1** Construction	**3.22.1** 2017
	144-269,701	**3.22.2** Internal line between Portile de Fier and Resita (RO)	**3.22.2** Portile de Fier to Resita (RO)	**3.22.2** C.N.T.E.E. TRANSELECTRICA S.A.(RO)	**3.22.2** New 400 kV AC OHL of 116 km and with a capacity of 1380 MVA between existing substation 400 kV Portile de Fier and new 400 kV substation Resita, extension with one bay of 400 kV substation Portile de Fier, new 400 kV substation Resita, with 400/220 kV and 400/110 kV transformers, as development of the existing 220/110 kV substation.	**3.22.2** Permitting	**3.22.2** 2017
	144-270,705	**3.22.3** Internal line between Resita and Timisoara/Sacalaz (RO)	**3.22.3** Resita (RO) to Timisoara/Sacalaz (RO)	**3.22.3** C.N.T.E.E. TRANSELECTRICA S.A.(RO)	**3.22.3** Upgrade of an existing 220 kV AC double circuit line (OHL) between Resita – Timisoara (RO) to 400 kV double circuit line Resita-Timisoara/Sacalaz of which: 74 km from Resita to Timisoara with a capacity of 1380 MVA and 92 km from Resita to Sacalaz with a capacity of 1380 MVA, both overhead lines will be built on common towers up to Icloda on 58 km. Moreover, the project includes the new 400 kV substation Timisoara and replacement of 220 kV substation Sacalaz with 400 kV substation.	**3.22.3**Permitting	**3.22.3** 2022
	144-270	**3.22.4** Internal line between Arad and Timisoara/Sacalaz (RO)	**3.22.4** Arad to Timisoara/Sacalaz (RO)	**3.22.4** C.N.T.E.E. TRANSELECTRICA S.A.(RO)	**3.22.4** Upgrade of the existing 220 kV AC double circuit line (OHL) Timisoara/Sacalaz-Arad to 400 kV as follows: 14 km of line will be build single circuit between Sacalaz-C.Aradului-connection point, 11 km single circuit from Timisoara to connection point and the rest 42 km of the line will be double circuit from connection point to Arad.	**3.22.4** Planned, but not yet in permitting	**3.22.4** 2022
	28 (70)	**3.22.5** Interconnection between Villanova (IT) and Lastva (ME)	**3.22.5** Villanova (IT) and Lastva (ME)	**3.22.5** CGES (ME); TERNA (IT)	**3.22.5** A new HVDC interconnection between Villanova (Italy) and Lastva (Montenegro) – about 425 km subsea cable and 25 km underground cable.	**3.22.5** Under construction	**3.22.5** 2019

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Increase of cross-border transmission capacity & integration of renewable energy sources

No	TYNDP reference	Definition	Details on location	Promoter(s)	Type / technology employed	Implementation status	Date of commissioning
3.1		Cluster Austria — Germany, including the following PCIs:					
	47-212	**3.1.1** Interconnection between St. Peter (AT) and Isar (DE)	**3.1.1** St. Peter (AT) to Isar/Altheim/ Ottenhofen (DE)	**3.1.1** TenneT TSO GmbH (DE) Austrian Power Grid AG (AT)	**3.1.1** 380 kV AC OHL between Isar and St. Peter with a total thermal capacitiy of 3.600 A per circuit, including 110 km of new line in DE (including Pirach), 61 km of new circuit on an existing line, new 380 kV switchgears in Altheim, Simbach, Pirach and St. Peter and one new 380/220 kV transformer in the substations Altheim and St. Peter.	**3.1.1** Permitting (finalised on Austrian side)	**3.1.1** 31.12.2021
	47-216	**3.1.2** Internal line between St. Peter and Tauern (AT)	**3.1.2** St. Peter (AT) to Tauern (AT)	**3.1.2** Austrian Power Grid AG (AT)	**3.1.2** Completion of the 380 kV AC line (OHL) with a length of approximately 174km and a capacity of approximately 2 x 2400 MVA between St.Peter and Tauern (as an important part of the 380 kV Ring) and namely: the upgrade of the existing 380 kV line between St.Peter and Salzburg from 220 kV operation to 380 kV operation and the erection of a new internal double circuit 380 kV line connecting Salzburg and Tauern, replacing the existing 220-kV-line on an optimized route (onshore). Moreover, the erection of the new substation Wagenham and Pongau and the integration of the existing substations Salzburg and Kaprun are planned.	**3.1.2** Permitting	**3.1.2** 2023
	47.219	**3.1.4** Internal line between Westtirol and Zell-Ziller (AT)	**3.1.4** Westtirol to Zell-Ziller (AT)	**3.1.4** APG	**3.1.4** Upgrade of the existing 220kV-line Westtirol - Zell-Ziller and erection of additional 220/380kV-Transformers. Line length: 105km.	**3.1.4** Planning	**3.1.4** 2024
3.2	26.218	**3.2.2** Internal line between Lienz and Obersielach (AT)	**3.2.2** Lienz (AT) to Obersielach (AT)	**3.2.2** Austrian Power Grid AG	**3.2.2** **A 380kV AC line (OHL) with a length of approximately 190 km and a capacity of approximately 3000 MVA connecting the substations Lienz and Obersielach to close the Austrian 380kV Ring in the southern grid area (onshore).”**	**3.2.2** Planned but not yet in permitting	**3.2.2** 2026

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3.4	210-1380	**3.4** Interconnection between Wurmlach (AT) and Somplago (IT)	**3.4** Carinthia Region (AT) to Friuli Venezia Giulia Region (IT)	**3.4** Alpe Adria Energia S.r.l.	**3.4** A new 220 kV AC line with a capacity of 300 MW.	**3.4** Permitting	**3.4** 2021

3.11		Cluster of internal lines in Czech Republic including the following PCIs:					
	200-306,307,308	**3.11.1** Internal line between Vernerov and Vitkov (CZ)	3.11.1 Vernerov (CZ) to Vitkov (CZ)	**3.11.1** ČEPS, a.s.	**3.11.1** Building a new 400 kV substation at Vítkov with 400/110kV transformer of rating power 350 MVA as an additional reinforcement to the existing 220 kV substation. Building a new 400 kV AC double circuit OHL of 83 km with a capacity of 2x1730 MVA between Vernerov and Vitkov (onshore).	**3.11.1** Permitting	**3.11.1** 2025
	200-309	**3.11.2** Internal line between Vitkov and Prestice (CZ)	**3.11.2** Vitkov (CZ) to Prestice (CZ)	**3.11.2** ČEPS, a.s.	**3.11.2** Building a new 400kV AC double circuit OHL of 86 km with a capacity of 2x1730 MVA between Vitkov and Prestice (onshore). The proje ct includes the extension and upgrading of the existing substation Prestice 420 kV	**3.11.2** Permitting	**3.11.2** 2022
	200-311,315	**3.11.3** Internal line between Prestice and Kocin (CZ)	**3.11.3** Kocin (CZ) to Prestice (CZ)	**3.11.3** ČEPS, a.s.	**3.11.3** Extension and upgrade of the existing substation 400/110kV at Kocin that will enable connection of 5 new OHL (onshore). Reinforcement of the existing 400 kV AC OHL of 116.8 km between Kocin and Prestice from single circuit with a capacity of 1360 MVA to double circuit with a capacity of 2x1730 MVA (onshore). The project will have to include partial construction of the new double-circuit 400 kV OHL Chrast – Prestice and Kocin-Dasny	**3.11.3** Permitting	**3.11.3** 2028
	200-312, 313,	**3.11.4** Internal line between Kocin and Mirovka (CZ)	**3.11.4** Kocin (CZ) to Mirovka (CZ), V413 (CZ) looping to Mirovka	**3.11.4** ČEPS, a.s.	**3.11.4** Extension and upgrade of the existing substation 420kV at Mirovka that will enable the connection of new 400kV AC OHLs of about 26.5 km and capacity of 2x1730 MVA between the existing 400 kV OHL V413 and 420 kV substation Mirovka (onshore) . Building of a new 400 kV AC OHL with a length of 120.5 km and a capacity of 2x1730 MVA between Kocin and Mirovka (onshore).	**3.11.4** Permitting	**3.11.4** 2025

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	200-, 314	**3.11.5** Internal line between Mirovka and line V413 (CZ)	**3.11.5** Mirovka (CZ) to V413 (CZ)	**3.11.5** ČEPS, a.s. (CZ)	**3.11.5** Building a new double-circuit 400 kV overhead line between Mirovka and V413.	**3.11.5** Permitting	**3.11.5** 2019
3.12	130-665	**3.12** Internal line in Germany between Wolmirstedt and Bavaria to increase internal North-South transmission capacity *	**3.12** Wolmirstedt (DE) to Isar, Bavaria (DE)	**3.12** 50Hertz Transmission (DE) TenneT TSO GmbH (DE)	**3.12** New HVDC connection with a capacity of minimum 2 GW from North-East Germany (Area of Wolmirstedt, with high installed capacities of RES), to the South of Bavaria (area of Isar with high consumption and connections to storage capabilities. Further investigations for capacity extension are ongoing (see TYNDP project 130). . There was a change in technical layout due to German law: project promoters are obliged to build this connection as underground cable. Current planning investigates the execution of a 540 km HVDC underground cable system (525 kV or 320 kV).	**3.12** Planned but not yet in permitting	**3.12** 2025
3.14		Internal reinforcements in Poland [part of the cluster currently known as "GerPol Power Bridge"], including the following PCIs:					
	230-353, 1035	**3.14.2** Internal line between Krajnik and Baczyna (PL)	**3.14.2** Krajnik (PL) to Baczyna (PL)	**3.14.2** PSE S.A.(PL)	**3.14.2** Construction of new 400 kV AC double circuit OHL of about 90 km with thermal capacity of 2x1870 MVA between Krajnik and Baczyna. One circuit temporarily working at 220 kV on the section between Krajnik and Gorzów. The project provides additional capacity (NTC – Net Transfer Capability) of 1500 MW in terms of import and 500 MW export; greater level of safety and reliability of operation of the transmission network in Poland due to enhanced control of power flow. Construction of new 400 kV substation Baczyna which will be connected by splitting and extending of the existing line and upgrading limitations between Krajnik and Plewiska.	**3.14.2** Design and permitting	**3.14.2** 2021
	230-355	**3.14.3** Internal line between Mikułowa and Świebodzice (PL)	**3.14.3** Mikułowa (PL) to Świebodzice (PL)	**3.14.3** PSE S.A.(PL)	**3.14.3** Construction of new 400 kV double circuit line of about 100 km with thermal capacity of 2x1870 MVA between Mikułowa and Świebodzice with one circuit temporarily working at 220 kV. The project provides additional capacity (NTC – Net Transfer Capability) of 1500 MW in terms of import and 500 MW export.	**3.14.3** Planned but not yet in permitting	**3.14.3** 2023

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	230-1232	**3.14.4** Internal line between Baczyna and Plewiska (PL)	Baczyna(PL) to Plewiska(PL)	**3.14.4** PSE S.A. (PL)	**3.14.4** Construction of 2x400 kV line Baczyna-Plewiska. The project provides additional capacity (NTC – Net Transfer Capability) of 1500 MW in terms of import and 500 MW export; greater level of safety and reliability of operation of the transmission network in Poland due to enhanced control of power flow.	**3.14.4** Planned but not yet in permitting	**3.14.4** 2024

3.21	150-616	**3.21** Interconnection between Salgareda (IT) and Divača — Bericevo region (SI)	**3.21** Salgareda (IT) to Divača/Bericevo (SI) (still under consideration)	**3.21** Terna - Rete Elettrica Nazionale SpA.(IT), ELES d.o.o. (SI)	**3.21** The project includes a new 300-500 kV HVDC marine cable and an onshore connection (underground cable/overhead line) between Italy and Slovenia with a length between about 150 and 250 km and a capacity up to 1000 MW.	**3.21** Under consideration on Slovenian side; Under permitting on Italian side.	**3.21** 2022/2025

3.27	29 .635	**3.27** Interconnection between Sicily (IT) and Tunisia node (TU) [currently known as "ELMED"]*	**3.27** Sicily (IT) to Tunisia (TU)	**3.27** TERNA ENERGY S.A (IT)	**3.27** **ELMED is a new 600 MW interconnection between Tunisia and Sicily via HVDC submarine cable.**	**3.27** **Design and permitting**	**3.27** 2022

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Ending energy isolation

3.10		Cluster Israel — Cyprus — Greece between Hadera and Attica region [currently known as "EUROASIA Interconnector"], including the following PCIs:			**3.10:** The project consists of a 500 kV DC underwater electric cable and any essential equipment and/or installation for interconnecting the Cypriot, Israeli and the Greek transmission networks (offshore). The project will have a capacity of 2000 MW and a total length of around 820 nautical miles/around 1518 km (329 km between CY and IL, 879 km between CY and Crete and 310 km between Crete and Athens). Converter stations will be of the Voltage Source Converter (VSC) and will allow for reverse transmission of electricity. The dumping depth of the cable in some areas between IL and CY is expected to reach 2200 m and the respective depth in some areas between CY and EL is expected to reach 3000 m.		
	219-1407	**3.10.1** Interconnection between Hadera (IL) and Kofinou (CY)*	**3.10.1** Hadera (IL) to Kofinou (CY)	**3.10.1** EuroAsia Interconnector Ltd		**3.10.1** Permitting	**3.10.1** 2022
	219-1409	**3.10.2** Interconnection between Kofinou (CY) and Korakia, Crete (EL)*	**3.10.2** Kofinou (CY) to Korakia (EL)	**3.10.2** Euro Asia Interconnector Ltd		**3.10.2** Permitting	**3.10.2** 2021
	219-1410	**3.10.3** Internal line between Korakia, Crete and Attica region (EL)*	**3.10.3** Korakia (EL) to Attica (EL)	**3.10.3** Euro Asia Interconnector Ltd, in cooperation with ADMIE (EL)		**3.10.3** Permitting	**3.10.3** 2020

Electricity storage

3.23	218	**3.23** Hydro-pumped electricity storage in Yadenitsa (BG)	**3.23** Yadenitsa site is located about 20 km to the South of Belovo, along the valley of Belovska River Connection point to transmission network: substation Vetren	**3.23** NATSIONALNA ELEKTRICHESKA KOMPANIA EAD (NEK EAD)	**3.23** Chaira PSHPP with its 788 MW pumping capacity is the most significant regulating capacity in the Bulgarian EPS. increasing the production potential of Chaira PSHPP by the construction of Yadenitsa Dam at the level of Chaira Dam and their connecting by pressure derivation will allow transfer of waters in a gravity way from one reservoir to the other, which will mean volume increase of the lower reservoir of Chaira PSHPP by 9 mln m^3.	**3.23** Permitting	**3.23** 2022

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3.24	217	**3.24** Hydro-pumped electricity storage in Amfilochia (EL)	**3.24** Location: Municipality of Amfilochia, Prefecture of Aitoloakarnania (EL) Connection point to transmission network: Ultra H.V. Substation Acheloos (150/400 kV)	**3.24** TERNA ENERGY S.A	**3.24** Pumped Storage Complex with two independent upper reservoirs: Agios Georgios and Pyrgos, using as lower reservoir the artificial reservoir of Kastraki (owner Public Power Corporation). The equipment for energy production and energy pumping will be installed in two independent power houses, near Kastraki reservoir.	**3.24** Permitting	**3.24** 2021

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4.Priority Corridor Baltic Energy Market Interconnection Plan ('BEMIP Electricity')

Integration of offshore and onshore renewable generation in the system

No	TYNDP reference	Definition	Details on location	Promoter(s)	Type / technology employed	Implementation status	Date of commissioning
4.1	36-141	**4.1** Denmark — Germany interconnection between Ishøj / Bjæverskov (DK) and Bentwisch (DE) via offshore windparks Kriegers Flak (DK) and Baltic 1 and 2 (DE) [currently known as "Kriegers Flak Combined Grid Solution"]*	**4.1** Ishøj / Bjæverskov (DK) to Bentwisch (DE)	**4.1** 50Hertz Transmission (DE) Energinet.dk (DK)	**4.1** The Kriegers Flak Combined Grid Solution is a new 400 MW offshore interconnection between Bentwisch (DE) and Ishøj/ Bjæverskov (DK) via the offshore wind farms Kriegers Flak (DK), Baltic 1 and 2 (DE). As Eastern Denmark and Germany are two different synchronous areas, the frequency transformation is necessary. This will be done by two voltage source converters (VSC) as back to back solution (B2B) that convert the alternating current (AC) from the Nordic synchronous area into direct current (DC) and directly back to AC, now adapted to the Continental European synchronous area. The project envisages three main components: 400MW HVDC VSC B2B onshore converter station, offshore substation extensions, approximately 2x25 km sea cables with a voltage of 150 kV, as well as the extention of onshore substations in Bentwisch and Ishøj/ Bjæverskov, C-T ype-Filter (MSCDN) and shunt reactor.	**4.1** Under construction	**4.1** 12/2018

4.10		Cluster Finland – Sweden [currently known as "Third interconnection Finland – Sweden"], including the following PCIs:					
	111.396	**4.10.1** Interconnection between northern Finland and northern Sweden	**4.10.1** Messsaure (SE1) to Keminmaa (FI)	**4.10.1** Fingrid (FI) SVK (SE)	**4.10.1** Third AC 400 kV overhead line interconnector between Finland north and Sweden SE1. Strengthening the AC connection between Finland and Sweden is necessary due to market needs, security of supply in Finland, new wind power generation and larger conventional units.	**4.10.1** Permitting	2025
	96.801	**4.10.2** Internal line between Keminmaa and Pyhänselkä (FI)	**4.10.2** Keminmaa to Pyhänselkä (FI)	**4.10.2** Fingrid (FI)	**4.10.2** The project is 400 kV overhead line in North Finland. It is part of the 3rd AC cross border project between Finland and Sweden. Will also allow for the integration of new RES generation at Bothnian bay.	**4.10.2** Permitting	2024

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Increasing market integration in the Baltic region

4.2		Cluster Estonia – Latvia between Kilingi-Nõmme and Riga [currently known as "Thirdinterconnection] including the following PCIs:					
	62-386	**4.2.1** Interconnection between Kilingi-Nõmme (EE) and Riga CHP2 substation (LV)	**4.2.1** Kilingi-Nomme (EE) Riga CHP2 (LV)	**4.2.1** AS Augstsprieguma Tikls (LV), Elering AS (EE)	**4.2.1** Estonia – Latvia third interconnection will consist of 211 km of 330 kV AC OHL with a capacity of 1143 MVA, constructed mostly on the existing transmission line routes between Kilingi-Nõmme and RigaCHP2 substations (onshore).	**4.2.1** Under construction	**4.2.1** 2020
	62-735	**4.2.2** Internal line between Harku and Sindi (EE)	**4.2.2** Harku to Sindi (EE)	**4.2.2** Elering AS (EE)	**4.2.2** New double circuit AC OHL with 2 different voltages 330 kV and 110 kV, with a capacity of 1143 MVA/240 MVA and a length of 175 km. Major part of new internal connection will be established on existing lines on the Western part of Estonian mainland (onshore).	**4.2.2** Under construction	**4.2.2** 2020
	163-1062	**4.2.3** Internal line between Riga CHP2 and Riga HPP (LV)	**4.2.3** Riga CHP2 to Riga HPP (LV)	**4.2.3** AS Augstsprieguma Tikls (LV)	**4.2.3** Reinforcement of the existing 330 kV OHL between Riga CHP2 and Riga HPP (onshore) with a length of 12 km and a planned capacity of 600 MW (onshore).	**4.2.3** Permitting	**4.2.3** 2020

4.4	60(124)-385	**4.4.1** Internal line between Ventspils, Tume and Imanta (LV)	**4.4.1** Ventspils to Imanta (LV)	**4.4.1** AS Augstsprieguma Tikls (LV)	**4.4.1** The PCI represents the third stage of the Kurzeme Ring project, which consists of a transmission network reinforcement project in Latvia with the construction of new 330 kV OHL in the Western part of Latvia, connecting Grobina substation with Imanta substation (Riga) by 330 kV network. The PCI covers the section Ventspils-Tume-Imanta (Riga), with a length of 210 km and a capacity of 940 MVA (onshore).	**4.4.1** Under construction	**4.4.1** 2019
	124-733	**4.4.2** Internal line between Ekhyddan and Nybro/Hemsjö (SE)	**4.4.2** Part 1: Ekhyddan to Nybro Part 2: Nybro to Hemsjö	**4.4.2** Svenska Kraftnät (SE)	**4.4.2** New 400 kV AC single circuit OHL of 70-100 km between Ekhyddan and Nybro and a new 400 kV AC single circuit OHL of 85-90 km between Nybro and Hemsjö with total capacity of 2200 MVA (onshore).	**4.4.2** Permitting	**4.4.2** 2023

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4.5	123-373	**4.5.2** Internal line between Stanisławów and Ostrołęka (PL)	**4.5.2** Stanisławów to Ostrołęka (PL)	**4.5.2** PSE S.A.(PL)	**4.5.2** Construction of new 400 kV AC double-circuit OHL line with a length of 108 km and capacity of 2x1870 MVA between Ostrołęka and Stanisławów will partly use route the existing 220 kV single-circuit line between Ostrołęka and Miłosna. In one circuit of 400 kV line, the Wyszków substation will be enabled. After the construction of 400 kV line, the 220 kV line will be dismantled. Expansion of 400 kV Ostrołęka substation and construction of a new 400 kV substation in Stanisławów, which will be connected by splitting and extending of 400 kV lines Miłosna - Narew and Miłosna - Siedlce.	**4.5.2**: Planned, but not yet permitting	**4.5.2** 2023

Integration and synchronisation of the Baltic States' electricity system with the European networks

4.8		Integration and synchronisation of the Baltic States' electricity systemwith the European networks, including the following PCIs:					
	163-1010	**4.8.1** Interconnection between Tartu (EE) and Valmiera (LV)	**4.8.1** Tartu (EE) to Valmiera (LV)	**4.8.1** AS Augstsprieguma Tikls (LV), Elering AS (EE)	**4.8.1** Reinforcement of existing 330 kV OHL between Tartu (EE) and Valmiera (LV) with a length of 133 km (48 km in LV and 85 km in EE) and a planned capacity of 1000 MVA.	**4.8.1** Planning, but not yet permitting	**4.8.1** 2024
	163-1012	**4.8.2** Internal line between Balti and Tartu (EE)	**4.8.2** Balti to Tartu (EE)	**4.8.2** Elering AS (EE)	**4.8.2** Reinforcement of existing 330 kV OHL between Balti and Tartu (EE) with a planned capacity of 1143 MVA.	**4.8.2** 1 Planning, but not yet permitting	**4.8.2** 2024
	163-1011	**4.8.3** Interconnection Tsirguliina (EE) and Valmiera (LV)	**4.8.3** Tsirguliina (EE) to Valmiera (LV)	**4.8.3** AS Augstsprieguma Tikls (LV), Elering AS (EE), Latvijas elektriskie tikli(LV)	**4.8.3** Reinforcement of existing 330 kV OHL between Tsirguliina (EE) and Valmiera (LV) with a length of 62 km (49 km in LV and 13 km in EE) and a planned capacity of 1000 MVA.	**4.8.3** Planning, but not yet permitting	**4.8.3** 2024
	163-1013	**4.8.4** Internal line between Eesti and Tsirguliina (EE)	**4.8.4** Eesti to Tsirguliina (EE)	**4.8.4** Elering AS (EE)	**4.8.4** Reinforcement of existing 330 kV OHL between Eesti and Tsirguliina (EE) with a planned capacity of 1143 MVA.	**4.8.4** Planned, but not yet in permitting	**4.8.4** 2025
	170-1034	**4.8.5** Internal line between substation in Lithuania and state border (LT)	**4.8.5** A substation (tbd)(LT). to state border (LT)	**4.8.5** LITGRID AB (LT)	**4.8.5** New 400 kV OHL between new planned 400 kV Marijampole substation in Lithuania and the state	**4.8.5** Under consideration	**4.8.5** 2031

					border (onshore). New line routing and implementation time depends from decisions for project “Baltic synchronization"		
	170.1004	**4.8.7** Internal line between Paide and Sindi (EE)	**4.8.7** Paide to Sindi (EE)	**4.8.7** Elering AS (EE)	**4.8.7**. Internal reinforcement of Paide-Sindi 330kV overhead line. The operational procedure to overcome the overloading issues has been developped,	**4.8.7** Postponed	**4.8.7** 2025
	170.382	**4.8.8** Internal line between Vilnius and Neris (LT)	**4.8.8** Vilnius to Neris (LT)	**4.8.8** LITGRID AB (LT)	**4.8.8** New single circuit 330kV OHL (943 MVA, 62,5 km lentgh). Investment implementation time depends on the project "Baltic synchronization”	**4.8.8** Planning	**4.8.8** 2024
		4.8.9 Further infrastructure aspects of the synchronisation of the Baltic States’ electricity system with the European networks	**4.8.9** Estonia, Latvia, Lithuania	**4.8.9** AS Augstsprieguma Tikls (LV), Elering AS (EE),) LITGRID AB (LT)	**4.8.9** This generic project will aim at assessing all possible options for the enhanced integration of the Baltic States’ electricity network into the European Network, including their synchronous operation. The project is focusing on several synchronizing scenarios using HVAC interconnections and HVDC-links	**4.8.9 N/A**	

Electricity storage

4.6	211	**4.6** Hydro-pumped storage in Estonia	**4.6** Paldiski (EE)	**4.6** Energia sa lvPakri OÜ (EE)	**4.6** Estonian Hydro-pumped storage of 500 MW and storage capacity of 6 GWh . Technically feasible: enough water column in Ribaroja’s reservoir, independently of the alternation of dry/wet years; enough backpressure in pumps. This storage project of Estonia enables saving in generation capacity of 16 - 20 Meuro/year. Idealfor future offshore wind farm project associated to the Zèfir Project, allowing energy denuclearization of the area.	**4.6** Permitting	**4.6** 2027

4.7	1009 –(212)	**4.7** Capacity increase of hydro-pumped electricity storage in Lithuania — Kruonis (LT)	**4.7** Kruonis (LT)	**4.7** Lietuvos Energija (LT)	**4.7** Installation of a new 225 MW variable speed (asynchronous) unit in Hydro-pumped storage in Kruonis with current installed capacity of 900 MW (4 units of 225 MW each). Existing units have 74% of cycle efficiency in maximum power output and can operate in the range of 160–225 MW in generation mode but have no flexibility in pump mode. The new unit will have pump mode ranging from 110 to 225 MW and the cycle efficiency of up to 78%.	**4.7** Under consideration	**4.7** 2022-2023

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5. Priority Corridor North-South Gas Interconnections in Western Europe ('NSI West Gas')

Increasing the bidirectional flows between the Iberian Peninsula and the internal gas market

5.4	TRA-N-168 TRA-N-283 TRA-N-729 TRA-N-284 TRA-N-285	**5.4.1** Interconnection ES-PT (3rd interconnection) – 1st phase **5.4.2** Interconnection ES-PT (3rd interconnection) – 2nd phase	**5.4.1** Zamora (ES) to the Portuguese border (PT) **5.4.2** Guitiriz-Zamora - Adradas pipeline Compressor station Cantanhede Pipeline Cantanhede – Mangualde	**5.4.1** Enagás Transporte SAU (ES) REN Gasodutos (PT) **5.4.2** Enagás Transporte SAU (ES) REN Gasoductos (PT)	**5.4.1** This first phase consists of a pipeline between Celorico da Beira (PT) and Zamora (ES) (700 mm, 248 km) , with a bidirectional capacity of 70.0 GWh/d. In addition, compression reinforcements (+4 MW) are also included in the compressor station of Zamora (Spain). **5.4.2** The second phase of the third interconnection between Spain and Portugal project comprises: - In Spain, the construction of a Guitiriz-Zamora-Adradas gas pipeline with a total length of 625km (with different diameters between 600-800 mm); - In Portugal, the project will include the installation of a compressor station in Cantanhede (12 MW) and the construction of a pipeline with a length of 67 km connecting Cantanhede to Mangualde (line duplication, with a diameter of 500 mm). The final capacity values are: - From ES to PT will be 139 GWh/d ; - From PT to ES will be 126 GWh/d.	**5.4.1** Planned but not yet in permitting (Spain). Permitting phase (Portugal). **5.4.2** Planned.	**5.4.1** 2022 **5.4.2** 2025

5.5	TRA-N-252	**5.5.1** South Transit East Pyrenees [currently known as "STEP"]	**5.5.1** Hostalrich (ES) – Barbaira (FR)	**5.5.1** TIGF (FR) Enagás Transporte S.A.U. (ES)	**5.5.1** In Spain (Enagás Transporte section): · a pipeline from Castelnou to Villar de Arnedo (length 214 km, diameter 640 mm, parallel to the existing one) and the reinforcement of the Compressor Station in Zaragoza (compressor power+5 MW) · a pipeline from Tivissa to Arbos (length 114 km, diameter 740 mm, parallel to the existing one), and	**5.5.1** Planned	**5.5.1** 2022

	TRA-N-727; TRA-N-256;	**5.5.2** Eastern Gas Axis Spain — France — interconnection point between Iberian Peninsula and France, including the compressor stations at St-Avit, Palleau and St. Martin de Crau [currently known as "Midcat"]	**5.5.2 Villar de Arnado (ES) to St Arnoult des Bois (FR)**	**5.5.2** GRTgaz (FR); TIGF (FR); Enagás Transporte SAU (ES)	reinforcements of the Compressor Stations in Tivissa and Arbos (compressor power +21 MW) In France, a reinforcement of the French network on a total length of 793 km and 4 compressor stations : · Midi pipeline (TIGF section 40 km, GRT section 200 km, both with a diameter of 1050 mm) **5.5.2** Iberian-French corridor, Eastern Axis-Midcat.: - a loop from Castelnou to Vilar de Arnedo (and Compressor Station Zaragoza) (length 214 km, compressor power 5 MW; capacity 135 GWh/d); - a loop from Tivissa to Arbos (Compressor Station Tivissa and Arbos) (length 114 km; compressor power 21 MW, capacity 110 GWh/d) - a 793 km pipeline from Arc Lyonnais to Perche (capacity of 160-230 GWh/d.) and 2 new stations in Palleau (50 MW) and St-Martin de Crau (30MW) This pipeline consists of following sections : • Arc Lyonnais (GRTgaz section) 150 km • Barbaira - Border (TIGF section) 120 km • Eridan (GRTgaz section) 220 km • Midi pipeline (GRTgaz section) 200 km • Midi pipeline (TIGF section) 40 km • Perche (GRTgaz section) 63 km	**5.5.2** Planned	**5.5.2** 2022-2024

Ending the energy isolation of Malta

5.19	TRA-N-031	**5.19** Connection of Malta to the European Gas network — pipeline interconnection with Italy at Gela	**5.19** MT to IT – interconnection point at Gela	**5.19** The Ministry for Energy and Water Management (MT)	**5.19** A 159 km gas pipeline interconnection between Gela (Sicily) to Delimara (Malta) including terminal stations (diameter of 560mm and daily capacity of 56 GWh/day); intended for the importation of natural gas from the Italian gas network to Malta.	**5.19** Permitting	**5.19** 2024

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Increasing the interoperability of gas ssytems in North Western Europe

No	TYNDP reference	Definition	Details on location	Promoter(s)	Type / technology employed	Implementation status	Date of commissioning
5.1	TRA-N-059	**5.1.1** Physical reverse flow at Moffat interconnection point (IE/UK)	**5.1.1** Moffat Entry Point in South West Scotland (UK)	**5.1.1** GNI(UK) Ltd.	**5.1.1** Physical reverse flow at the Moffat interconnection point, which is currently uni-directional, supporting forward flow only from UK to IE, the Isle of Man and Northern Ireland (onshore). The planned capacity 38.5 GWH/d.	**5.1.1** Planned	**5.1.1** 2020
	TRA-N-027	**5.1.2** Upgrade of the SNIP (Scotland to Northern Ireland) pipeline to accommodate physical reverse flow between Ballylumford and Twynholm	**5.1.2** Twynholm, Scotland (UK) to Ballylumford, Northern Ireland (UK)	**5.1.2** Premier Transmission Limited	**5.1.2** Installation of bi-directional compression on Scotland to Northern Ireland pipeline (SNIP); pipework modifications to allow bi-directional metering and flow control and moving gas odourisation point to a new point downstream of the bidirectional transmission system.The power of compressor station is 9.5 MW. The planned capacity is 132 GWh/d.	**5.1.2** Under consideration	**5.1.2** 2021
5.10	TRA-N-208	**5.10** Reverse flow interconnection on TENP pipeline in Germany	**5.10** Cross-border interconnection point (GÜP) Walbach (DE) –VTP (DE)	**5.10** Fluxys TENP GmbH (DE)	**5.10** Creation of minimum 10 GWh/h entry capacity at the cross-border interconnection point (GÜP) Wallbach towards the Virtual Trading Point (VTP) of the market area NetConnect Germany (NCG) through two main measures: - Adding of a reverse flow functionality through the reversal of the compressor station Hügelheim and the adaptation of further TENP installations and hence allow the import of gas from Italy via Switzerland into Germany as from end summer 2018. - Construction of the first industrial-scale deodorisation plant in Europe to remove the odorant Tetrahydrothiophene (THT) which is injected into the French high pressure transmission system but not allowed in the German high pressure transmission network. The new plant will hence allow the import of gas from France via Switzerland into Germany as from end 2019.	**5.10** Permitting	**5.10** 2019

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5.11	TRA-F-214	**5.11** Reverse flow interconnection between Italy and Switzerland at Passo Gries interconnection point	**5.11** Passo Gries interconnection point, North area of IT	**5.11** Snam Rete Gas SpA (IT)	**5.11** The project consists in expanding the capacity of existing gas network from East to West of the Po Valley and will allow to make available 22 MScm/day of firm capacity at Passo Gries Exit point and 18MScm/day of competing capacity between Passo Griess and Tarvisio Exit Point from October 2018. The length of the new onshore pipeline is 80 km and has a daily capacity of 421 GWh/day as overall reverse flow capacity increment. The power of the compressor station is 95 MW.	**5.11** Under construction	**5.11** 2018
5.21	TRA-N-429 TRA-N-500	**5.21** Adaptation low to high calorific gas in France and Belgium	**5.21** Hauts de France area (FR), including Taisnières/Blareignie Interconnection point In Belgium : works at different locations depending of conversion phase and network configuration	**5.21** Fluxys (BE), GRTgaz (FR), and Storengy (FR)	**5.21** The L-gas exports to Belgium and to France will be gradualy reduced as from 2018 until cancellation in 2030, because of the depletion of the Groningen gas field and of the earthquakes resulting from gas production. The PCI covers both the required infrastructure to ensure access to H-gas supply , to transport H gas to the newly converted L-zones in Belgium and in France and all actions for the switch to H-gas. In France, the project consists in creating 9 new connections between H-gas and L-gas grids, the construction of a new 10km pipeline of 300 mm of diameter in Bethune and Lens area, the adaptation of facilities at Taisnières entry point (GRTgaz) and the conversion to H-gas of the Gournay underground storage (Storengy). In Belgium, the project consists in constructing or adapting pressure reduction stations, in installing new isolation valves and in integrating the H-gas and L-gas backbones at different locations in order to supply progressively the domestic L-market and the L Interconnection Points with H-gas by 2029.	**5.21** Planned	**5.21** From 2018 to 2029

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Increasing diversification and storage capacity

	UGS-N-294	**5.1.3** Development of the Islandmagee Underground Gas Storage (UGS) facility at Larne (Northern Ireland)	**5.1.3** Northern Ireland near the town of Larne, nearest interconnection point is 23 (UK) The facility will connect to the Northern Ireland Gas Transmission System at Ballylumford	**5.1.3** Islandmagee Storage Ltd	**5.1.3** UGS is planned to consist of eight caverns, capable of storing up to a total of 420 MCM of gas., allowing for a withdraw capacity of 22 MCM/day and an injection capacity of 12 MCM/day.	**5.1.3** Permitting	**5.1.3** 2021
5.3	LNG-N-030	**5.3** Shannon LNG Terminal and connecting pipeline (IE)	**5.3** Between Tarbert and Ballylongford in County Kerry (IE)	**5.3** Shannon LNG Limited	**5.3** Construction of a liquefied natural gas (LNG) regasification terminal (and an associated 500 MW High Efficiency CHP plant) with capacity of 17MCM/d at commissioning and 28.3MCM/d at full build out on the southern shore of the Shannon Estuary in County Kerry, Ireland. Construction of the 26 km gas pipeline to export up to 26.8 MCM/day to the national grid at Foynes, Co. Limerick (initial deliverability of 16.1 MCM/d). Terminal will consist of up to 4 tanks of 200,000 m3 each and a jetty capable of receiving LNG ships of up to 266,000 m3 cargo capacity	**5.3** Planning Permitting	**5.3** 2022

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6. Priority Corridor North-South Gas Interconnections in Central Eastern and South Eastern Europe ("NSI East Gas")

Central and South Eastern Europe Energy Connectivity ("CESEC") Gas Priority Projects

6.24		**6.24** Cluster: Phased capacity increase on the Bulgaria — Romania — Hungary — Austria bidirectional transmission corridor (currently known as "ROHUAT/BRUA") to enable 1.75 bcm/a in the 1st phase and 4.4 bcm/a in the 2nd phase, and including new resources from the Black Sea in the 2nd and/or 3rd phase::					
	TRA-N-286; TRA-N-358; TRA-N-423	**6.24.1** ROHUAT/BRUA – 1st phase, including: - Romanian-Hungarian reverse flow: Hungarian section 1st stage CS at Csanádpalota (1st phase) ; - Development of the transmission capacity in Romania from Podișor to Recas, including, a new pipeline, and three new compressor stations in Podisor, Bibesti and Jupa; - GCA Mosonmagyaróvár CS (development on the Austrian side) (1st phase)	**6.24.1** Bacia – Nadlac route (RO); Podisor – Corbu – Hateg – Horia route; Mosonmagyaróvár GCA (AT),	**6.24.1** SNTGN TRANSGAZ SA (RO) ;FGSZ Ltd. (HU);Gas Connect Austria GmbH (AT)	**6.24.1** - A new compressor station at Csanádpalota with 2 units (4.5 MW each) - necessary to create pressure conditions for the transportation capacity of 1.75 bcm/a from and towards Romania.New onshore pipeline with a length of about 280 km with a capacity of 4.4 bcm/year and two new compressor stations located along the route. The power of the compressor stations amounts to a total of 33 MW. - The scope of the project is the construction of a new gas transmission pipeline to enable the connection between the Technological Node Podișor and GMS Horia and the construction of compressor stations along the route (CS Jupa, CS Bibești and CS Podișor). The new onshore Podișor - Hațeg - Recas pipeline with a length of 479 km and with a transmission capacity of 1.75 bcma – towards Hungary and 1.5 bcma towards Bulgaria diameter: 800 mm. The power of the compressor station(s) amounts to a total 27.6 MW ISO . The project will create the link between the existing interconnection points of the Romanian transmission system with the Bulgarian transmission system (at Giurgiu IP) and of the Hungarian transmission system (at Csanád palota IP), and 3 new gas compressor stations- -Compressor station at Baumgarten including pipeline works in order to generate freely allocable capacity (FZK) at Entry Mosonmagyaróvár of 153.08 GWh/d	**6.24.1** -Planned but not yet in permitting; -Procurement of long lead items and construction services -Planned but not yet in permitting	**6.24.1** - 2019; - 2019 - 2020

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6.5		Cluster Krk LNG terminal and evacuation pipelines towards Hungary and beyond, including the following PCIs:					
	LNG-N-082 TRA-N-090	**6.5.1** Development of a LNG terminal in Krk (HR) up to 2.6 bcm/a– Phase I and connecting pipeline Omišalj – Zlobin (HR)	**6.5.1** Omišalj, on the island of Krk (HR); Omišalj to Zlobin (HR)	**6.5.1** LNG Hrvatska d.o.o.; Plinacro d.o.o.	**6.5.1** LNG terminal based on a migration concept: 1st Phase: - FSRU, with correspondent capacity of up to 2.6 bcm/year in the first transmission system development phase and up to 3.5 bcm/year after upgrade of transmission system. ; The pipeline of 18 km and 1000 mm diameter connected to the future LNG solution in Omišalj will connect the LNG to the Croatian gas transmission system, and will be a continuation of the existing Hungary-Croatia interconnection (Városföld – Slobodnica). The pipeline represents the first phase of the LNG evacuation pipelines and will allow the flow of 2,6 BCM/year from the LNG terminal.	**6.5.1** Permitting	**6.5.1** Pipeline – 2019- LNG: 2019
	TRA-N-075 TRA-N-1058	**6.5.6** Expansion of LNG terminal in Krk (HR) above 2.6 bcm/a – Phase II and evacuation pipelines Zlobin – Bosiljevo – Sisak – Kozarac – Slobodnica (HR)	**6.5.6** Zlobin via Bosiljevo, Sisak, the gas node Kozarac to Slobodnica (HR); Krk (HR)	**6.5.6** LNG Hrvatska d.o.o. Plinacro Ltd	**6.5.6** LNG terminal based on a migration concept: 2nd Phase: onshore LNG terminal, with a correspondent annual send-out capacity of interconnection pipeline HR-HU. Construction of new, upgrade and extension of existing pipelines with a total distance of 308 km, namely: II phase: Zlobin – Bosiljevo pipeline – 58 km; Bosiljevo – Sisak pipeline - 100 km; Sisak – Kozarac pipeline – 22 km; Capacity of up to 3,5 BCM/year III phase: Kozarac – Slobodnica pipeline – 128 km. Capacity up to max technical capacity of interconnection pipeline HR-HU. .	**6.5.6** permitting	**6.5.6** LNG : After 2030 Pipeline II phase : 2020 Pipeline III phase: 2023

6.8		Cluster Interconnection Greece - Bulgaria and necessary reinforcements in Bulgaria, including the following PCIs:					
	TRA-N-378 TRA-N-128 TRA-N-957	**6.8.1** Interconnection Greece – Bulgaria [currently known as IGB] between Komotini (EL) – Stara Zagora (BG);	**6.8.1** Komotini (EL) to Stara Zagora (BG); Kipi (EL); Komotini (EL)	**6.8.1** ICGB AD;for pipeline and metering station,	**6.8.1** New onshore pipeline with a length of 185 km and a daily capacity of approximately 13.7 MCM/day. The power of the compressor station(s) (CS) is of	**6.8.1** Permitting (for pipeline) Under consideration (for CS) - Owner's engineer	**6.8.1** pipeline : 2020**;** 2020 cs 2020

		compressor station at Kipi (EL) and metering station at Komotini		DESFA S.A. for compressor station at Kipi (EL)	approximately ~~20~~ 9 MW. A compressor station at Kipi will be needed to ensure the supply with gas of the IGB from the DESFA system. The metering station at Komotini will enable the Gas Transmission System of Greece to supply gas into the IGB pipeline.	procurement launched - Line pipe supply procurement launched - EPC procurement planed Q1, 2018 - Construction Permit Bulgaria territory obtained - Constraction Permit Greek territory Q2, 2018	
	TRA-N-298	**6.8.2** Necessary rehabilitation, modernization and expansion of the Bulgarian transmission system	**6.8.2** BG Existing gas transmission infrastructure on the territory of Bulgaria	**6.8.2** Bulgartransgaz EAD (BG)	**6.8.2.** Activities related to the overall rehabilitation, modernization, reinforcement and expansion of the existing gas transmission infrastructure on the territory of Bulgaria (modernization and rehabilitation of compressor stations, inspections, repair and replacement of sections; expansion and modernization of the existing network)	**6.8.2** Permitting	**6.8.2** 2021

6.10	TRA-N-137	**6.10** PCI Gas interconnection Bulgaria — Serbia [currently known as "IBS"]	**6.10** Sofia district, from Sofia to Kalotina (BG), and through Dimitrovgrad to Nis (RS)	**6.10** Ministry of Energy Bulgaria (BG) Srbijagas (RS)	**6.10** New onshore pipeline with a length of 150 km and a daily capacity of 4.93 MCM/day interconnecting Bulgarian and Serbian gas systems between Sofia (BG) and Nis (RS). The gas interconnection IBS connecting the national gas transmission networks of Bulgaria and Serbia will involve the use of: - potential and existing gas transmission infrastructure on the territories of Bulgaria and Serbia - Chiren UGS capacity (Bulgaria) - the existing UGS Banatski Dvor and future Banatski Itebej (Serbia). and will include new entry/exit points	**6.10** Permitting	**6.10** 2022

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North-South Gas Interconnections in Central Eastern and South Eastern Europe Corridor between Poland and Croatia

No	TYNDP reference	Definition	Details on location	Promoter(s)	Type / technology employed	Implementation status	Date of commissioning
6.2		**6.2** Interconnection between Poland, Slovakia, Czech Republic and Hungary with the related internal reinforcements, including one or more of the following PCIs groups::					
	TRA-N-190 **TRA-N-275**	**6.2.1** Poland – Slovakia interconnection	**6.2.1** Strachocina (PL) – Veľké Kapušany (SK)	**6.2.1** Gas Transmission Operator GAZ-SYSTEM S.A. (PL) Eustream, a.s.(SK)	**6.2.1** New cross-border pipeline with the length of approximately 164 km and maximum daily capacity of 15.6 MCM/day in the direction SK-PL and of 12.9 MCM/day in the direction PL-SK. Construction of new compressor station in Strachocina (Poland), modification of the compressor station at Veľké Kapušany (Slovakia) and construction of border gas metering station on the Slovak territory. The interconnection will offer the Slovak market the access to gas supplies coming from LNG terminal in Świnoujście and the Baltic Pipe project	**6.2.1** Design and Permitting	**6.2.1** 2021
	TRA-N-245	**6.2.2** North – South Gas Corridor in Eastern Poland	**6.2.2** Rembelszczyzna to Strachocina (PL) and Tworóg to Strachocina (PL)	**6.2.2** Gas Transmission Operator GAZ-SYSTEM S.A. (PL)	**6.2.2** New onshore pipelines and compressor stations in Eastern Poland which are required to ensure an effective and efficient cross-border network expansion: Rembelszczyzna - Wronow pipeline – 135 km; Rozwadów – Końskowola - Wronów pipeline – 103 km; Jarosław - Rozwadów pipeline – 60 km; Hermanowice - Jarosław pipeline – 39 km; Hermanowice - Strachocina pipeline – 72 km; Tworóg – Tworzeń pipeline – 56 km; Pogórska Wola - Tworzeń pipeline – 160 km; Strachocina - Pogórska Wola pipeline – 98 km; Gustorzyn - Wronów pipeline – 316 km.	**6.2.2** Rembelszczyzna to Strachocina (PL) : Feasibility studies Tworóg to Strachocina (PL) : Design and Permitting	**6.2.2** 2023 2020
	TRA-N-273 **TRA-N-136**	**6.2.10** Poland — Czech Republic Interconnector [currently known as "Stork II"]	**6.2.10** Libhošť (CZ) – Hať (CZ/PL) – Kędzierzyn (PL) – Wroclaw (PL)-	**6.2.10** Gas Transmission Operator GAZ-	**6.2.10** New onshore cross-border pipeline with a maximum daily capacity of 153.2 GWh/d (13.7 mcm/day) in the direction PL->CZ and 219.1 GWh/d	**6.2.10** PL-CZ interconnector: Permitting completed in PL Czeszów to Kędzierzyn (PL):	**6.2.10** 12/2022

			Wierzchowice(PL)	SYSTEM S.A.; (PL) NET4GAS, s.r.o.(CZ)	(19.6 mcm/d) in the direction CZ->PL. Polish part : Total 249 km: Zdzieszowice - Kędzierzyn pipeline – 19 km; Zdzieszowice - Wrocław pipeline – 130 km; Czeszów - Kiełczów pipeline – 32 km; Czeszów - Wierzchowice pipeline – 14 km; Compressor station Kedzierzyn 30 MW PL-CZ interconnection polish (Czech Section) - 52 km: Libhošť (CZ) – Hať (CZ/PL) PL-CZ interconnector (Polish section) – 54 km	Under construction	
	TRA-N-247	**6.2.11** North-South Gas corridor in Western Poland	**6.2.11** Wroclaw to Kędzierzyn (PL); Kiełczów – Wierzchowice (PL)	**6.2.11** Gas Transmission Operator GAZ-SYSTEM S.A. (PL)	**6.2.11** New onshore pipelines and compressor stations in Western Poland required to ensure an effective and efficient cross-border network expansion. The corridor is planned to be connected to PL-CZ interconnection and PL-SK interconnection. Transmission infrastructure projects between Lwówek and Kędzierzyn (PL) , total length 205 km consists in: Lwowek-Odolanow pipeline (diameter 1,000 mm; length 162 km) Odolanow compressor station 20 MW Tworóg - Kędzierzyn pipeline (diameter 1,000 mm; lenght 43 km)	**6.2.11** Under construction	**6.2.11** 2020
	TRA-N-136	**6.2.12** Tvrdonice-Libhošť pipeline, including upgrade of CS Břeclav (CZ)	**6.2.12** Tvrdonice (CZ) – Libhošť (CZ) and CS Břeclav (CZ)	**6.2.12** NET4GAS, s.r.o.(CZ)	**6.2.12** New onshore Tvrdonice – Libhošť (CZ) DN 1000 pipeline with a length of ca. 155 km and upgrade of Břeclav compressor station at Breclav (CZ) by 18+6 MW are required to ensure an effective and efficient cross-border network expansion. The total pipeline's Tvrdonice (CZ)-Libhošť-Hat (CZ-PL) length(the CZ side of CZ-PL	**6.2.12** Permitting	**6.2.12** 12/2022
	TRA-N -636 **TRA-N-524**	**6.2.13** Increase of the transmission capacity at the Slovakia – Hungary interconnection	**6.2.13** Szada-Balassagyarmat	**6.2.13** Magyar Gáz Tranzit Zrt.(HU)	**6.2.13** Reducing the flow direction switch operation time. Developing the transmission capacity in HU>SK and SK>HU direction from interruptible capacity to non-interruptible (firm) capacity. Enhancement of Exit transmission capacity with 102 GWh/day in HU>SK direction and enhancement of Entry transmission capacity with 26 GWh/day in SK>HU direction at Balassagyarmat with new compressors on Szada Compressor station. The available bi-directional transmission capacities will	**6.2.13** Planning	**6.2.13** 2019 2020

					be the same in both direction at the Slovak-Hungarian interconnector.		
	TRA-N-831	**6.2.14** Enhancement of the Hungarian transmission system between Vecsés and Városföld required for the increased capacity at the Slovakia-Hungary interconnection	**6.2.14** Vecsés to Városföld (HU)	**6.2.14** Magyar Gáz Tranzit Zrt.(HU)	**6.2.14** Building of a new bi-directionnal high pressure transit pipeline of 80 km , diameter 800 mm between Vecsés and Városföld to extend the Slovak-Hungarian interconnection into south directon with hub and metering station at Városföld.	**6.2.14** Planning	**6.2.14** 2021
6.4	TRA-N-021 TRA-N-133	**6.4** PCI Bidirectional Austrian — Czech interconnection (BACI) between Baumgarten (AT) – Reinthal (CZ/AT) — Břeclav (CZ) with capacity up to 6.57 bcm/a[1]	**6.4** Baumgarten (AT) – Reinthal (CZ/AT) — Břeclav (CZ)	**6.4** GAS CONNECT AUSTRIA GmbH, NET4GAS, s.r.o.	**6.4** New DN800 BACI pipeline will be a new infrastructure directly connecting the Austrian and Czech market for the first time. It will be connected to the existing Czech transmission system via CS Břeclav and to the Austrian transmission system via Baumgarten. Capacity will reach up to 6.57 bcm/a. Implementation of BACI as a PCI will depend on the outcome of the pilot market connecting facility project "Trading Regional Upgrade". The TRU pilot project connects the Austrian and Czech gas transmission systems via Slovakia by using existing infrastructure only. The evaluation of the pilot project will be carried out after its completion, without delay, by the involved three Member States.	**6.4** Planned	**6.4** 2021
	TRA-F-334	**6.5.5** "Compressor station 1" at the Croatian gas transmission system	**6.5.5** Sisak (HR)	**6.5.5** Plinacro Ltd	**6.5.5** Construction of new compressor station to provide sufficient transmission capacities and natural gas delivery pressure conditions. Compressor station is integral part of the transmission system, and concerns investment in reverse flow capacity in accordance of EU Regulation EC 1938/2017	**6.5.5** Under construction	**6.5.5** 2019

[1] Implementation of BACI as a PCI will depend on the outcome of the pilot project "Trading Regional Upgrade".

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6.23	TRA-N-112 TRA-N-325	**6.23** Hungary – Slovenia interconnection (Nagykanizsa — Tornyiszentmiklós (HU) — Lendava (SI) – Kidričevo)	**6.23** Nagykanizsa — Tornyiszentmiklós (HU) — Lendava (SI) – Kidričevo	**6.23** Plinovodi d.o.o., FGSZ Zrt.	**6.23** Interconnector between the Hungarian and Slovenian transmission systems on the route Nagykanizsa - Tornyiszentmiklós (HU) - Lendava (SI) – Kidričevo, enabling access to underground storages in Hungary for Slovenian gas suppliers, to LNG terminals in northern Adriatic and other gas sources for Hungarian gas suppliers. The length of the gas pipeline is approximately 114 km and the expected maximum transmission capacity is up to 3.4MCM/day (38.1 GWh/day)	**6.23** Permitting	**6.23** 2020
6.26	TRA-N-086 TRA-N-094 TRA-N-105734 TRA-N-361 TRA-N-389 TRA-N-390	Cluster Croatia (HR) — Slovenia (SI) — Austria (AT) at Rogatec, including: **6.26.1** Interconnection Croatia — Slovenia (Lučko — Zabok - Rogatec) **6.26.2** Compressor station Kidričevo, 2nd phase of upgrade (SI) **6.26.3**. Compressor stations 2 and 3 at the Croatian gas transmission system **6.26.4** GCA 2015/08 Entry/Exit Murfeld (AT) **6.26.5** Upgrade of Murfeld/Ceršak interconnection (AT-SI) **6.26.6** Upgrade of Rogatec interconnection	- **6.26.1** Lučko (HR) — Zabok (HR) – Rogatec (SI); - **6.62.2** CS Kidričevo (SI); - **6.26.3** CS - 2, CS - 3 (HR); - **6.26.4** Murfeld (AT); - **6.26.5** IP at SI-AT border Murfeld (AT) to Ceršak (SI); - **6.26.6** Rogatec (SI)	Plinacro d.o.o. (HR); Plinovodi d.o.o. (SI); GAS CONNECT AUSTRIA GmbH (AT)	**6.26.1** a new pipeline of the capacity up to 5 bcm/y in both directions: Lučko-Zabok DN 700/75 bar - L36 km, - Zabok-Rogatec (SI) DN 700/75 bar - L34 km, **6.26.2** Upgrade of CS Kidričevo for higher operational pressure in M1/1 pipeline, higher flow and bidirectional operation, **6.26.3** two compressor stations at Croatian gas transmission system (in Slobodnica andZabok (HR)) that will enable reverse flow with the neighbouring countries, transport of gas from LNG solution of Krk to neighbouring countries, **6.26.4** New Gas compressor station of 13,7 MW in Murfeld (AT) and a pipe of 26,1 km ensures physical reverse flow capacity between Slovenia and Austria, 6.26.5 Murfeld/Ceršak interconnection: Adjustment of SI part to operating parameters of the transmission system of the Austrian TS; **6.26.6** Adjustment to operating parameters of the transmission system of the Slovenian and Croatian TSO, increasing the transmission capacity and enabling bidirectional operation (length 3.8 km).	**6.26.1** Permitting **6.26.2** Permitting **6.26.3** Planned but not yet in permitting **6.26.4** Planned but not yet in permitting **6.26.5** Permitting **6.26.6** Permitting	**6.26.1** 2020 **6.26.2** 2020 **6.26.3** 2022 **6.26.4** 2022 **6.26.5** 2020 **6.26.6** 2020

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Supporting production of natural gas from indigenous sources in the Black Sea

	TRA-N-018; TRA-N-061; TRA-N-123; TRA-N-358; TRA-N-362; TRA-N-377	**6.24.4** ROHUAT/BRUA – 2nd phase, including: - Városföld-Ercsi– Győr pipeline (HU) (2nd phase); - Ercsi-Százhalombatta pipeline (HU); - Városföld compressor station (HU); - Expansion of the transmission capacity in Romania towards Hungary up to 4.4 bcm/year (2nd phase) - Black Sea shore — Podișor (RO) for taking over the Black sea gas; Romanian-Hungarian reverse flow: Hungarian section 2nd stage Csanádpalota or Algyő (HU)(2nd phase)	**6.24.4** In Hungary, between - Városföld (Southern Great Plain), Ercsi (Central Hungary) and Győr (Western Transdanubia). - between Ercsi and Százhalombatta (Central Hungary). - close to the existing compressor station at Városföld (Central Hungary). - Jupa, Bibești and Podișor; - Black Sea shore – Podisor route - close to the existing measuring station at Csanádpalota (RO/HU border)	**6.24.4** FGSZ Ltd. (HU); SNTGN TRANSGAZ SA (RO)	**6.24.4** --Pipeline between Városföld-Ercsi and Győr nodes, DN1000, PN100, 210 km.This project will enable the Mosonmagyarovar interconnection point to reach its full capacity of 153 GWh/d from Austria to Hungary.It will also enable the Mosonmagyarovar interconnectionThe pipeline contains two main parts, one is a 98 km long DN1000, PN100 onshore natural gas pipeline between Városföld and Ercsi , the other one is a 112 km long DN1000, PN100 onshore natural gas pipeline between the Ercsi and Győr. New onshore pipelines, which will improve the daily capacity of Csanádpalota IP (RO/HU) and (HU/RO) directions up to 11.4 Mcm/day (4,17 Bcm/a (0oC)), and Mosonmagyaróvár IP (HU/AT) and (AT/HU) directions up to 13.6 Mcm/day (4,93 Bcm/a (0oC)) together with the Városföld CS and Romanian-Hungarian reverse flow Hungarian section 2nd stage projects. - New 11 km long DN800, PN63 onshore natural gas pipeline Ercsi and Százhalombatta (Central Hungary), enabling potential transmission towards Vecsés IP up to 13.6 Mcm to prepare the increased SK/HU bidirectional capacity deliveries - One 5.7 MW additional compressor unit. The improved power of the compressor station at Városföld ensures the needed operational pressure and enables the 13,6 Mcm/day (4,93 Bcm/a (0oC)) capacity up to the Austrian and/or Vecsés 4 IP (Slovak border) and Mosonmagyaróvár IP (AT/HU) and (HU/AT) directions; it improves the daily capacity of Csanádpalota IP (RO/HU) and (HU/RO) directions up to 11.4 Mcm/day (4,17 Bcm/a (0oC)), - New pipeline between Recas and Horia with a length of 50 km , diameter 800 mm; upgrade of the existing compressor stations Jupa , Bibesti and Podisor with a	**6.24.4** - planned, but not yet in permitting; - planned, but not yet in permitting; - planned, but not yet in permitting; - permitting; permitting; - planned, but not yet in permitting;	**6.24.4** - 2022 - 2022 -2022 - 2022 - 2020

					total additional power of 13.8 MW ISO ., expansionof Horia measuring station - the project consists in the construction of a new onshore telescopic pipeline with a length of 308 kmand with a capacity of 6 bcm/year, with diameters of 48" (Dn 1200) and 40" (Dn 1000). - One 4.5 MW additional compressor unit at Csanadpalota and enlargement the measuring station up to 500 000 cm /h, which will improve the daily capacity of Csanádpalota IP (RO/HU) and (HU/RO) directions up to 11.4 Mcm/day (4,17 Bcm/a (0oC)).		
6.24.10	TRA-N-139; TRA-N-959; TRA-N-964	**6.24.10** ROHUAT/BRUA – 3rd phase, including: - Enhancement of the Romanian transmission system between Onesti-Isaccea and reverse flow at Isaccea - Enhancement of the Romanian transmission system between Onesti – Nadlac - Extension of the Romanian transmission system for taking over gas from the Black Sea shore	**6.24.10** Isaccea; Onesti to Nadlac Black Sea Shore - T1	**6.24.10** SNTGN Transgaz SA (RO)	**6.24.10** The project consists of: Phase I (commissioning 2018): - Interconnection between the NTS and the Transit 1 international transmission pipeline in the area of the Isaccea metering station; -Repair works to the Dn 800 mm Cosmesti - Onesti pipeline (66.0 km) Phase II (commissioning 2019): - Upgrades and developments within the Silistea Compressor Station, additional power of 5.94 MW; -Upgrades within the Onesti Compressor Station, additional power of 3.34 MW; -Changes within the TN Silistea and the TN Onesti. -Works within the TN Sendreni. The project consists in the development of the gas transmission capacity on the Onesti-Coroi-Hateg-Nadlac route: total length 843 km.. This requires: the rehabilitation of some existing pipelines; replacement of some of the existing pipelines with new pipelines or the building of new pipelines installed in parallel with the existing ones and the development of 4 or 5 new compressor stations having a total installed power of approximately 66- 82.5MW;- the project consists in the construction of a 25 km long Dn 500 transmission pipeline from the Black Sea shore to the T1 international transmission pipeline.	**6.24.10** Permitting Pre-feasibility study; Permitting	**6.24.10** 2019 2023; 2019

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Bringing further diversification to Central and South Eastern Europe

6.9	LNG-N-062 TRA-N-063 TRA-N-1090 TRA-N-128	**6.9.1** LNG terminal in Northern Greece	**6.9.1** Region of Thrace (EL) – Sea of Thrace (NE part of EL), 17.6 km SW from Alexandroupolis)	**6.9.1** Gastrade S.A. for the FSRU and the pipeline. DESFA S.A. for the Metering/Regulating Station and the Kipi Compressor Station.	**6.9.1** New offshore LNG FSRU near Alexandroupolis (mooring position 17.6 km SW of Alexandroupolis port), with a daily send out capacity of 15,1 MCM/day (168,7 GWh/day). The project consists of : - an LNG offshore Floating Storage and Regasification Unit (FSRU), a Mooring and a pipeline system, connecting the floating unit to the Greek National Natural Gas Transmission System (NNGTS). The FSRU will have a storage capacity of up to 170.000m^3 of LNG and a gas send out capacity of up to 900,000 Nm^3/h (with out redundancy) corresponding to 8.3 bln Nm^3/y. The FSRU will be permanently moored and will connect to the pipeline through two 12" flexible risers. - a gas transmission pipeline with a total length of 28 km (4 km onshore and 24 km subsea), a nominal diameter of 30" and a design pressure of up to 110 barg also comprising a line valve station near the shore crossing point. - a Metering and Regulating Station which will be constructed and operated by DESFA, the NNGS TSO, near the connection point of above pipeline with the NNGS. -a Compressor Station at Kipi that will allow the flow of gas, from Turkey to the NNGS, to continue, after the entry in operation of the FSRU which will inject gas to the NNGS at higher pressure.	**6.9.1** Permitting	**6.9.1** 2020

6.25		Cluster infrastructure to bring new gas to the Central and South-Eastern European region with the aim of diversification, including one or more of the following PCIs, developed in a coordinated and efficient manner:					
	TRA-N-654 TRA-N-655 TRA-N-656	6.25.1 Pipeline system from Bulgaria via Romania and Hungary to Slovakia [currently known as "Eastring"]	**6.25.1** B Velke Kapusany (SK-UA Border) - new IP at external border of the EU on	**6.25.1** Bulgartransgaz EAD, Transgaz SA,	**6.25.1** Eastring proje c t (Length: 1029 km) connects IP Veľké Kapušany with IP at the BG/TR border in the following routing options (in territory of Romania):	**6.25.1** Planned but not yet in permitting	**6.25.1** 2021

	TRA-N-628		the Bulgarian territory;	FGSZ Ltd, Eastring B.V.	– Option A: new pipeline passing production and storage areas and continuing to IP Isaccea and then to BG/TR border by utilizing existing RO-BG transit assets – Option B: new pipe line passing production and storage areas and continuing to BG/TR or an external border of the EU on the Bulgarian territory		
	TRA-N-592 TRA-N-593 TRA-N-594	**6.25.4** Infrastructure to allow the development of the Bulgarian gas hub	**6.25.4** Bulgaria - Several routes are envisaged	**6.25.4** Bulgartransgaz EAD (BG)	**6.25.4** The project shall include construction of new infrastructure and modernization and expansion of the existing one aimed at increasing the capacity of interconnectivity of Bulgartransgaz EAD national gas transmission network. - Looping CS Valchi Dol - Line valve Novi Iskar - Varna-Oryahovo gas pipeline - Construction of a Looping CS Provadia – Rupcha village	**6.25.4** Under consideration	**6.25.4** 2022

Gas storage projects

6.20		Cluster increase storage capacity in South-Eastern Europe, including one or more of the following PCIs:					

	UGS–N-138	**6.20.2** Chiren UGS expansion	**6.20.2** Chiren (BG)	**6.20.2** Bulgartransgaz EAD (BG)	**6.20.2** Expansion of the underground gas storage facility in depleted gas field in Chiren, Bulgaria, with following technical characteristics: Projected working gas volume of between 1000 MCM (existing + new); Projected withdrawal capacity maximum 10 MCM/day (existing +new); Injection capacity 8-10 MCM/day (existing +new). Cycling rate 1 times/year.	**6.20.2** Permitting	**6.20.2** 2024
	UGS-N-385 TRA-N-1092	**6.20.3** South Kavala UGS facility and metering and regulating station (EL) and one of the following PCIs:	**6.20.3** UGS South Kavala (GR)	**6.20.3** HRADF for the development of the UGS DESFA S.A.for the Metering/Regulating station at the connection with the transmission network	**6.20.3** Construction of: - one Metering and Regulating Station of 44-55 GWh/d capacity at Kavala for the potential interconnection of the Greek transmission system with the UGS in South Kavala. -New underground storage facility in depleted gas field, connected via a 34 kmpipeline (of which 32 km offshore) to the National Natural Gas System. Projected Working Gas Volume 360 MCM; Withdraw capacity 4 MCM/day; Injection capacity 5 MCM/day; Cycling rate 2 times/year.	**6.20.3** Under condideration	**6.20.3** 2023
	UGS-N-233	**6.20.4** Depomures storage in Romania	**6.20.4** Targu Mures (RO)	**6.20.4** Engie Romania S.A. (RO)	**6.20.4** The project consists in the revamping and expansion of an existing gas storage facility of 300 MCM situated in Targu Mures, Central Romania. The rationale of the project is three fold (i) increase operational independence by building its own compression unit as currently compression services are rented from another party and connection of the storage to high pressure gas transport network, (ii) expand the storage capacity from 300 MCM to 400 MCM in a first stage and to 600 MCM in a second stage and (iii) increase flexibility of the storage by increasing injection and withdrawing capacity from an existing average of 1.7 MCM/ day to approx. 5.MCM/day after implementation of the second stage.	**6.20.4** Construction	**6.20.4** ph1: 2020 ph2: 2023
	UGS-N-371	**6.20.6** Sarmasel underground gas storage in Romania	**6.20.6** Sarmasel, 35 km N-V of Targu Mures (RO), 35km N of Ludus (RO), 48 km E of Cluj Napoca (RO)	**6.20.6** Romgaz S.A. RO	**6.20.6** Extension and upgrading of storage facility in depleted field Sarmasel, with the following technical characteristics: Working Gas Volume 1550 MCM (900 existing + 650	**6.20.6** Fesability	**6.20.6**2024

					new) with a cushion gas of 1,130 mln m3; - Supplementing the gas cushion by approximately 400 MCM; Withdraw capacity 10 (6,75 existing + 3,25 new) MCM/day; Injection capacity 10 (6 existing + 4 new) MCM/day; Cycling rate 1 times/year - Drilling new infill wells for injection/withdrawal; - Upgrading and completing the surface facilities of the injection/withdrawal wells		

6.5.3	N/A	No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
6.5.4	N/A	No longer considered a PCI	N/A	N/A	N/A	N/A	
6.8.3	N/A	No longer considered a PCI	N/A	N/A	N/A	N/A	
6.9.3	N/A	No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
6.11	N/A	No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
6.12	N/A	No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
6.20.5	N/A	No longer considered a PCI	N/A	N/A	N/A	N/A	
6.25.2	N/A	No longer considered a PCI	N/A	N/A	N/A	N/A	

Updated in April 2018

7. Priority Corridor Southern Gas Corridor ('SGC')

Bringing diversitifcation of gas sources – connecting to the Caspian Basin

No	TYNDP reference	Definition	Details on location	Promoter(s)	Type / technology employed	Implementation status	Date of commissioning
7.1		PCI Cluster of integrated, dedicated and scalable transport infrastructure and associated equipment for the transportation of a minimum of 10 bcm/a of new sources of gas from the Caspian Region, crossing Azerbaijan, Georgia and Turkey and reaching EU markets in Greece and Italy, and including the following PCIs:					
	TRA-N-339 (TCP)	**7.1.1** Gas pipeline to the EU from Turkmenistan and Azerbaijan, via Georgia and Turkey, [currently known as the combination of "Trans-Caspian Gas Pipeline" (TCP), "South-Caucasus Pipeline FutureExpansion" (SCPFX) and "Trans Anatolian Natural Gas Pipeline" (TANAP)]	**7.1.1 TCP:** From Turkmenistan (tie-in to the East-West Pipeline or offshore collection points) to Azerbaijan through the Caspian Sea	**7.1.1 TCP:** W-Stream Caspian Pipeline Company Ltd	**7.1.1 TCP:** Offshore pipeline in the Caspian Sea with a length of 300 km and an ultimate capacity of 32 bcm/a will branch-off at a connection with the East-West pipeline in Turkmenistan or, for the first stage, from a collection point of offshore Caspian production/treatment in Turkmenistan. It will feed into Sangachal terminal/SCP in Azerbaijan.	**7.1.1 TCP:** Pre-feasibility	**7.1.1 TCP:** 2020
	TRA-N-1138 (SCPFX)		**SCPFX:** From Sangachal Terminal (AZ) through Azerbaijan and Georgia to Georgia/Turkey border with subsequent tie-in to TANAP	**SCPFX:** SOCAR MIDSTREAM OPERATIONS	**SCPFX:** Upgrade of the existing SCP pipeline system between Azerbaijan and Turkey via Georgia with throughput capacity upgrades of 5 bcm/a by 2022 (on top of the expanded capacities under SCPX project). SCPFX project currently envisages the addition of a compressor station in Azerbaijan and pipeline looping along the route of SCP.	**SCPFX:** Feasibility studies	**SCPFX:** 2022
	TRA-F-221 (TANAP)		**TANAP:** From the Georgia/Turkey border (tie-in to the SCP to the Greece/Turkey border at Kipi (tie-in to TAP)	**TANAP:** SOCAR/TANAP Natural Gas Transmission Company	**TANAP:** New onshore and offshore pipeline between the Eastern and Western borders of Turkey with a length within the borders of Turkey of 1807 km on the section up to Greece connection to TAP Pipeline Project and an initial throughput capacity of 16 bcm/a (up to 490.0 GWh/d). Offshore section for the Dardanelle crossing through the Sea of Marmara.	**TANAP:** Under construction	**TANAP:** 2018 Turkish exit point 2019 Greek Cross Border exit point
	TRA-F-051 TRA-N-941 TRA-N-	**7.1.3** Gas pipeline from Greece to Italy via Albania and the Adriatic Sea [currently known as "Trans-Adriatic Pipeline" (TAP)] including metering and regulating station and compressor station at Nea	**7.1.3** From the Greece-Turkey border point at Kipoi (tie-in to TANAP) to Province of Lecce (IT) via Nea Messimvria (EL), Albania and	**7.1.3** Trans Adriatic Pipeline A.G. for TAP Pipeline	**7.1.3** TAP Pipeline: new onshore and offshore pipeline between Greece/Turkey and Italy with a total length of 878 km (773 km onshore and 105 km offshore). Connecting with TANAP at the Greek-Turkish border, TAP will cross Northern Greece, Albania and the	**7.1.3** TAP Pipeline: Under construction Metering and Regulating station: FEED phase	**7.1.3** TAP Pipeline: 2020 Metering /Regulating station 2019

	971	Messimvria	the Adriatic Sea	DESFA S.A. for the metering and regulating station and compressor station at Nea Messimvria	Adriatic Sea before reaching Southern Italy, where it connects to the Italian gas network. The initial capacity is 10 bcm/a. The power of the compressor station(s) is 90 MW. For the interconnection of TAP with the Greek transmission system a metering and Regulating station (capacity of 142 GWh/d) will be built in Nea Messimvria. Furthermore, a compressor station (27 MW) will be built in Nea Messimvria in order to enable flow from the Greek system to TAP	Compressor station: Planning	Compressor station: 2022

Bringing further diversification of gas sources – connecting to the Eastern Mediterranean Basin

7.3		PCI Cluster infrastructure to bring new gas from the East Mediterranean gas reserves, including:					
	TRA-N-330 TRA-N-1091	**7.3.1** Pipeline from the East Mediterranean gas reserves to Greece mainland via Crete [currently known as "EastMed Pipeline"], with metering and regulating station at Megalopoli and dependent on it the following PCIs:	**7.3.1** The pipeline will connect the recently discovered gas fields in the Levantine Basin and in the south east Mediterranean, with Greece mainland via Crete	**7.3.1** IGI Poseidon S.A. DESFA S.A.for the Megalopoli Metering & Regulating Station	**7.3.1** New onshore and offshore pipeline (excluding upstream pipeline section) of approximately 1870 km. The pipeline will have the initial capacity of 10 bcm/y. The total power of the compressor stations to be installed will be around 225 MW. The Metering & Regulating station at Megalopoli, will give the potential to connect the Greek gas transmission system with the East-Med pipeline.	**7.3.1** Pipeline: FEED phase Metering/Regulating station: Planned	**7.3.1** Pipeline: 2024/25 Metering/Regulating station: 2022
	TRA-N-010	**7.3.3** Offshore gas pipeline connecting Greece and Italy [currently known as "Poseidon Pipeline"]	**7.3.3** Thesprotia (EL) to Otranto (IT)	**7.37.3** IGI Poseidon S.A.	**7.3.3.** The Poseidon project includes: - compression station in Thesprotia (120MW); - onshore pipeline between the compression station and the Greek landfall; - new offshore pipeline of approximately 216km with a capacity of up to 329.4 GWh/day between the Greek and Italian landfalls; - onshore pipeline between the Italian landfall and the metering station in Otranto. Poseidon project is designed to initially transport 14 bcm/y of gas	**7.3.3** Permitting	**7.3.3** 2022
	TRA-N-007	**7.3.4** Reinforcement of the South-North internal transmission capacities in Italy [currently known as "Adriatica Line"]	**7.3.4** Central Italy; Pipeline from Sulmona to Minerbio; Compressor station in	**7.3.4** Snam Rete Gas S.p.A. (IT)	**7.3.4** The project consists in a new onshore pipeline of 430 km and in a new compressor station of 33 MW that allow to realize new transmission capacity of approximately 24 MCM/day (264 GWh/day) to	**7.3.4** Permitting	**7.3.3** 2023

			Sulmona		transport gas from new or existing entry points in the south of Italy.		

7.5	TRA-N-1146	**7.5** Development of gas infrastructure in Cyprus [currently known as "Cyprus Gas2EU"]	**7.5** Cyprus	**7.5** Ministry of Energy Commerce Industry and Tourism (MECIT) (CY)	**7.5** The CyprusGas2EU project involves 2 technological options: FSRU for LNG imports to Cyprus and gas storage	**7.5** Planned but not yet in permitting	**7.5** 2020

7.1.2	N/A	No longer considered a PCI	N/A	N/A	N/A
7.1.7	N/A	No longer considered a PCI	N/A	N/A	
7.4.1	N/A	No longer considered a PCI	N/A	N/A	
7.4.2	N/A	No longer considered a PCI	N/A	N/A	

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8. Priority Corridor Baltic Energy Market Interconnection Plan in Gas ('BEMIP Gas')

Ending the isolation of the Baltic States and Finland

No	TYNDP reference	Definition	Details on location	Promoter(s)	Type / technology employed	Implementation status	Date of commissioning
8.1	TRA-N-895 TRA-N-928	**8.1.1** Interconnection Estonia - Finland [currently known as "Balticconnector"]	**8.1.1** Siuntio (FI) to Kiili (EE)	**8.1.1** Baltic Connector OY (FI) and Elering AS (EE)	**8.1.1** New bidirectional offshore pipeline (Inkoo-Paldiski, DN500, 80 bar) of 80 km, plus 50 km onshore pipeline in EE (Kiili-Paldiski pipeline, DN 700, 55 bar) and 20 km onshore pipeline in FI (Siuntio-Inkoo pipeline, DN500, 80 bar) including metering and compressor stations at both ends with a daily nominal capacity of 7.2 mcm/day. The power of each compressor station is 10 MW.	**8.1.1** Procurement and construction	**8.1.1** 2019
8.5	TRA-N-212 TRA-N-341	**8.5** Poland-Lithuania interconnection [currently known as "GIPL"]	**8.5** Holowczyce (PL) - Jauniunai (LT),	**8.5** Gas Transmission Operator GAZ-SYSTEM S.A. (PL) and AB Amber Grid (LT)	**8.5** The project includes: • new onshore, bidirectional pipeline with a total length of approx.. 503 km (approx 165 km in the territory of LT and approx.. 338 km in the territory of PL) and with capacity of 2.4 bcm/year in the direction PL->LT, and up to 1.9 bcm/year in the direction LT->PL. The capacity in the direction PL->LT may be extended up to 4.1 bcm/y in the second stage of the project development, • the compressor station in Gustorzyn (approx. 16 MW).	**8.5** Design andPermitting	**8.5** 2021
8.2		Cluster infrastructure upgrade in the Eastern Baltic Sea region, including the following PCIs:					
	TRA-N-342 TRA-N-382	**8.2.1** Enhancement of Latvia — Lithuania interconnection	**8.2.1** Riga to lecava (LV) and lecava to the Lithuanian border; Kiemenai GM station (LT)	**8.2.1** JSC Conexus Baltic Grid, and AB Amber Grid	**8.2.1** Increase of the interconnection capacity between Latvia and Lithuania. The solution for the interconnection and the exact scope of the works will be determined in the feasibility study.	**8.2.1** Planned but not yet in permitting	**8.2.1** 2020
	TRA-N-915	**8.2.2** Enhancement of Estonia — Latvia interconnection	**8.2.2** Puiatu - Karksi (EE)	**8.2.2** Elering AS	**8.2.2** The project will allow bi-directional gas flow between Estonian and Latvian gas transmission systems and additionally enables bi-directional gas transport between Finnish and Baltic gas systems after the construction of Balticconnector offshore pipeline.	**8.2.2** Procurement and construction	**8.2.2** 2019

					It consists of the bi-directional gas metering station near Estonia-Latvia border in Karksi (GMS Karksi) + border valve (BV) between GMS Karksi/border, and the bi-directional compressor station in Puiatu (CS Puiatu) in South–Estonia. Max capacity of the new bi-directional GMS Karksi will be 10 MCM/day. Max capacity of CS Puiatu will be 0,42 MCM/h and pressure compressing from 24 bar to 55		

Bringinfg further diversification in the BEMIP gas region

8.3	TRA-N-780 TRA-N-271 TRA-N-428	Cluster infrastructure, including the following PCIs: **8.3.1** Reinforcement of Nybro — Poland/Denmark Interconnection **8.3.2** Poland–Denmark interconnection [currently known as "Baltic Pipe"]	**8.3.1** Egtved to the Baltic Pipe entry/exit point in DK **8.3.2** PL to DK.	**8.3.1** Energinet. (DK) **8.3.2** Gas Transmission Operator GAZ-SYSTEM S.A. (PL) and Energinet. (DK)	**8.3.1** Reinforcement of the Danish Transmission System for transporting approx. 10 bcm/year from Egtved to the Baltic Pipe entry/exit point in DK. The project includes - 200 km (estimated length) new onshore pipeline (DN 900-DN 1000) - 4 km offshore crossing (estimated length) of Lillebælt (DN 900) - and one compressor station in DK, i.e. Zealand CS (approx. 36 MW) **8.3.2** The project includes: - a new, bi-directional offshore gas pipeline connecting PL and DK through the Baltic Sea (estimated capacity of approx. 10 bcm/y; estimated length of approx. 260 - 310 km), - the receiving terminal (PL), - the onshore pipelines connecting the offshore pipeline with the national grids in PL and DK, - the DN 1000 Goleniow – Lwowek pipeline (PL) of approx 188 km, - and three compressor stations in PL i.e. Goleniow CS (approx. 12 MW), Odolanow CS (approx. 14 MW) and Gustorzyn CS (approx. 15 MW).	**8.3.1** Design and permitting **8.3.2** Design and permitting	**8.3.1** 2022 **8.3.2** 2022

8.6	LNG-N-032	**8.6** Gothenburg LNG terminal in Sweden	**8.6** Gothenburg Harbour, in a close proximity to an existing transmission pipeline Gothenburg – Stenungsund (SE)	**8.6** Swedegas AB	**8.6** New onshore LNG terminal with a connection to the transmission grid. The terminal will have an annual send-out capacity of 0.5bcm/year and a LNG storage capacity of up to 25.000 cm LNG. The maximum ship size is of 75.000 cm LNG. The terminal will provide for regasification, bunkering, and railcar and truck (un)loading possibilities.	**8.6** Permitting	**8.6** 2021
8.7	LNG-N-272	**8.7** Capacity extension of Świnoujście LNG	**8.7** Świnoujście, Western	**8.7** Gas	**8.7** The project includes:	**8.7** Design and Permitting	**8.7** 2022

		terminal in Poland	Pomerania region (PL) Closest cities: Świnoujście, Szczecin	Transmission Operator GAZ-SYSTEM S.A.	- the extension of the regasification capacity from 5 bcm/y to 7.5bcm/year, and - the construction of the third LNG storage tank of max 200.000 cm LNG.		

Gas Storage project

UGS-N-374	**8.2.4** Enhancement of Inčukalns Underground Gas Storage (LV)	**8.2.4** Inčukalns underground gas storage in Vidzeme, 45 km from Riga (LV)	**8.2.4** JSC Conexus Baltic Grid	**8.2.4.**Increase of the withdrawal capacity from the current 28-30 mcm/day to 33-35 mcm/day. The following activities are covered: overhaul of the piston compressors, overhaul of wells, construction of a new gas collection facility and installation of a new compression unit.	**8.2.4** Planned but not yet in permitting	**8.2.4** 2025

8.1.2.1	N/A	No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
8.1.2.2	N/A	No longer considered a PCI	N/A	N/A	N/A		

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9. Priority Corridor Oil Supply Connections in Central Eastern Europe ('OSC')

No		Definition	Details on location	Promoter(s)	Type / technology employed	Implementation status	Date of commissioning
9.1	N/A	**9.1** Adamowo — Brody pipeline: pipeline connecting the JSC Uktransnafta's handling site in Brody (Ukraine) and Adamowo Tank Farm (Poland)	**9.1** From Uktransnafta's Handling Site in Brody (UA) to Adamowo Tank Farm (PL)	**9.1** MPR Sarmatia Sp z o.o. and JSC Uktransnafta	**9.1** A pipeline of 396.3 km length (270.6 km in Poland and 125.7 km in Ukraine) connecting the JSC Uktransnafta's Handling Site in Brody (UA) (the end point of the existing Odessa-Brody oil pipeline) and Adamowo Tank Farm (PL) (the connection point to Przyjan oil pipeline(northern line of Druzba system). Diameter of the pipe is 800 mm (32") and initial technical capacity of 10 MTA with the possibility to increase up to 30MTA,	**9.1** Introduction of the Project into the Local Develpment Plans.	**9.1** 4-5 years after FID
9.2	N/A	**9.2** Bratislava — Schwechat — Pipeline: pipeline linking Schwechat (Austria) and Bratislava (Slovak Republic)	**9.2** From Schwechat (AT) to Bratislava (SK)	**9.2** BSP GmbH	**9.2** A pipeline of 80 km length linking Schwechat (AT) and Bratislava (SK) and with a diameter of 400 mm and the maximal throughput capacity of 5.0 million tonnes per year.	**9.2** Design and permitting	**9.2** 3,5-4,5 years after FID
9.4	N/A	**9.4.** Litvinov (Czech Republic) — Spergau (Germany) pipeline: the extension project of the Druzhba crude oil pipeline to the refinery TRM Spergau	**9.4** From Litvinov (CZ) to Spergau (DE)	**9.4** MERO CR, a.s. (CZ) .	**9.4** A pipeline between Litvinov (CZ) and Spergau (DE) with a diameter of 700 mm, length of 160 km and capacity of 5-6 MTA.	**9.4** Planning	**9.4** 3 years following FID
9.5	N/A	Cluster Pomeranian pipeline (Poland), including the following PCIs: **9.5.1** Construction of oil terminal in Gdańsk(phase II)	**9.5.1** Gdańsk Oil Terminal	**9.5.1** PERN S.A (PL).	**9.5.1** Handling terminal of 5 crude oil tanks and related installations within the oil terminal. Total Capacity 363.000 m 3	**9.5.1** Oil terminal Phase I came into operation on April 6th 2016 Phase II: project documentation under	**9.5.1** Phase II: 2020

						preparation	
	N/A	**9.5.2** Expansion of the Pomeranian pipeline: the second line of the pipeline	**9.5.2** From Miszewko Strzalkowskie (near Plock) to Gorki Zachodnie (near Gdansk)	**9.5.2** PERN S.A (PL).	**9.5.2** A pipeline of 234 km with the maximum technical capacity of 25 MTA	**9.5.2** Pre-feasibility; concept of technical analysis	**9.5.2** 2025

9.6	N/A	**9.6** TAL Plus: capacity expansion of the TAL pipeline between Trieste (Italy) and Ingolstadt (Germany)	**9.6** From Trieste (IT) to Ingolstadt (AT)	**9.6** TAL consortium	**9.6** Increasing capacity of the TAL pipeline in its first section between Trieste and Ingolstadt to allow for full diversification of oil supply to the Czech Republic.	**9.6** Design	**9.6** 3 years following FID

9.3	N/A	No longer considered a PCI	N/A	N/A	N/A	N/A	N/A

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10. Priority Thematic Area Smart Grids Deployment

No		Definition	Details on location	Promoter(s)	Type / technology employed	Implementation status	
10.3	N/A	**10.3** SINCRO.GRID (Slovenia,Croatia) aims at solving network voltage, frequency control and congestion issues enabling further deployment of renewables, by means of a virtual cross-border control centre based on advanced data management, common system optimisation and forecasting involving two neighbouring TSOs and the two neighbouring DSOs.	**10.3** The SINCRO.GRID project influence area is the entire Slovenian and Croatian network.	**10.3** ELES d.o.o. (Slovenian TSO) HOPS d.o.o. - Hrvatski operator prijenosnog sustava d.o.o. (Croatian TSO) SODO d.o.o. (Sistemski operater distribucijskega omrežja z električno energijo) (Slovenian DSO) HEP-ODS d.o.o. (HEP Operator distribucijskog sustava d.o.o.) (Croatian DSO)	**10.3** • A virtual cross-border control centre for renewable energy in Slovenia and Croatia which will consist of dedicated IT infrastructure and software to be used by system operators for the efficient and coordinated management of RES, using advanced algorithms for VVC optimization, secondary reserve, managing battery storage, advanced real time operation of the grid with advanced forecasting tools and using dynamic thermal rating. Furthermore, telecommunication support for RES control and communication platform for the DSM will be established. • Reactive power sources (substations Divača, Beričevo, Cirkovce/Krško) in Slovenia and in Croatia (substations Konjsko, Melina, Mraclin) using SVC at each TSO involved. • An advanced dynamic thermal rating system • In Slovenia a set of storage (batteries) and DG sources for relieving local power flows and alternative source for secondary control. • Activation of wind power plants in Croatia into the VVC optimization process.	**10.3** Feasibility studies and design phase	**10.3** 2021

10.4		**10.4** ACON (Czech Republic, Slovakia) - The main goal of ACON (Again COnnected Networks) is to foster the integration of the Czech and the Slovak electricity markets, increase the competition in the region, ensure adequate quality, safety and reliability of electricity supply	**10.4** Distribution areas of E.ON Distribuce and Západoslovenská distribučná CZ NUTS - Jihozápad (CZ03), Jihovýchod (CZ06), Střední Morava (CZ07) SK NUTS - Bratislavský kraj (SK01), Západné Slovensko (SK02)	**10.4** E.ON Distribuce, a.s. Západoslovenská distribučná, a.s.	**10.4** The existing distribution network will be modernized and improved, before basing a smart grids pilot project on it. Technical components include: • Over Head Lines (HV,MV,LV) - 25 km • Underground Cables (HV) - 210 km • 0,4 kV - 110 kV • smart devices, smart applications, AMM for steering purposes, IT, cables, overhead lines		**10.4** 2023

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10.5		**10.5** ALPGRID (Austria, Italy) - An innovative integration of synergetic, mature, technology-based solutions in order to simultaneously increase the operational efficiency of the Italian and Austrian regional electricity systems	**10.5** First level NIUTS regions: ITALY NORTH EAST, ITALY NORTH WEST, AUSTRIA SOUTH, AUSTRIA EAST, AUSTRIA WEST	**10.5** e-distribuzione (Italy), ENEL Green Power (Italy), ENEL Produzione (Italy), Wiener Netze (Austria), Kärnten Netz (Austria), VERBUND (Austria)	**10.5** The ALPGRID project integrates the deployment of mature technology elements with an innovative, open, cross-border flexibility platform operated jointly by aggregators in Austria and Italy. DSOs will enhance their ability to monitor and control their respective distribution grids, whereas market players both provide additional flexibility both from new and existing flexible assets , including storage, and increase their ability to forecast non-dispatchable RES generation. Aggregators located both in Italy and Austria cooperate to jointly set up and operate a cross-border flexibility platform.	**10.5** Under consideration	**10.5** 2020

10.6		**10.6** The Smart Border Initiative (France, Germany) integrates and optimizes local energy systems in the region, in line with the goals set by the EU Energy union.	**10.6** The geographical scope of the project concerns the cross-border region of Saarland - Lorraine (which is part of the Grand Est region).	**10.6** Enedis - Distribution System Operator (FR) Energis-Netzgesellschaft mbH Distribution System Operator (part of Innogy SE) (DE)	**10.6** A cross-border smart grid will be designed and implemented integrating flexibility linked to smart mobility as well as energy efficiency/sector-coupling in the DSO grid. The project will enable the Saarland and Lorraine regions to develop joint solutions for common challenges by making better use of the region's energy efficiency and renewable energy potential. The aim is to provide a cost effective way of enhancing security and encouraging investment,in renewables.	**10.6** Detailed design, study and planning of all steps Mod. 1: Develop the cross border a smart grid concept Mod. 2: Develop a smart mobility model and services linked to it, for instance charging stations for electric vehicles. Mod. 3: coupling electricity and heating through DHC to manage RES. Integrate flexibility provided by buildings and industries in the smart grid.	**10. 6** 2021

10.1	N/A	No longer considered a PCI	N/A	N/A	N/A	N/A	N/A
10.2	N/A	No longer considered a PCI	N/A	N/A	N/A	N/A	N/A

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11. Priority Thematic Area Electricity Highways

List of PCIs with double labelling as electricity highways

No	TYNDP reference	Definition	Details on location	Promoter(s)	Type / technology employed	Implementation status	Date of commissioning
Priority Corridor Northern Seas Offshore Grid ('NSOG')							
	74-443	**1.1.1** Interconnection between Zeebrugge (BE) and the vicinity of Richborough (UK)	**1.1.1** Gezelle (BE) – Richborough (UK)	**1.1.1** Nemo Link Limited	**1.1.1** New DC sea link including 130 km of DC subsea cable with 1000 MW capacity between Richborough and Gezelle (vicinity of Zeebrugge) (offshore + onshore)	**1.1.1** Under construction	**1.1.1** technical commissioning 2019 with operation in 2019
	183-1018	**1.3.1** Interconnection between Endrup (DK) and Niebüll (DE)	**1.3.1** Endrup (DK) to Klixbüll (in the vicinity of Niebüll) (DE)	**1.3.1** TenneT TSO GmbH (DE) Energinet.dk (DK)	**1.3.1** New 380 kV AC lines (OHL) of about 92 km (80 km in Denmark and 12 km in Germany) and new 380 kV-substations for integration of the available and further forecasted onshore wind in Schleswig-Holstein.	**1.3.1** in permitting	**1.3.1** 2022
	209-67	**1.3.2** Internal line between Brunsbüttel and Niebüll (DE)	**1.3.2** Brunsbüttel (DE) and Klixbüll in the vicinity of Niebüll) (DE)	**1.3.2** TenneT TSO GmbH (DE)	**1.3.2** New 380-kV-line Brunsbüttel – Klixbüll (in the vicinity of Niebüll) insid e Schlesw ig – Holstein (~120 km). Main focus of the project is the integration of onshore -RES – mainly wind – in Western Schlesig-Holstein. It is the southbound connection of PCI 1.3.1. and is necessary to increase the GTC between Denmark/West and Germany by 500 MW	**1.3.2** Under construction	**1.3.2** 2019
	39-144	**1.4.1** Interconnection between Kassø (DK) and Audorf (DE)	**1.4.1** Kassø (DK) to Dollern (DE)	**1.4.1** TenneT TSO GmbH (DE) Energinet.dk (DK)	**1.4.1** Upgrade of existing 220kV AC line to 400 kV thus building a new 400kV route from Denmark to Germany.	**1.4.1** Under construction	**1.4.1** 2020
	209-148	**1.4.2** Internal line between Audorf and Hamburg/Nord (DE)	**1.4.2** Audorf to Hamburg/Nord (DE)	**1.4.2** TenneT TSO GmbH (DE)	**1.4.2** New 380kV AC double circuit line (OHL) Audorf - Hamburg/Nord in existing 220kV corridor, Main focus of the proje ct is the inte gration of onshore -RES – m ainly wind – in Schleswig-Holst in.It is the southbound connection of PCI 1.4.1. and is necessary to increase the GTC between Denmark /West and Germany by 720/1000 MW.	**1.4.2** Under construction	**1.4.2** 2017
	209-147	**1.4.3** Internal line between Hamburg/Nord and Dollern (DE)	**1.4.3** Hamburg/Nord (DE) and Dollern (DE)	**1.4.3** TenneT TSO GmbH (DE)	**1.4.3** New 400kV AC double circuit line (OHL) between Dollern and Hamburg/Nord, including 2 new 400/220kV transformers in substation Hamburg/Nord (of 50Hertz Transmission) and new 400kV switchgear in Kummerfeld.	**1.4.3** Under construction	**1.4.3** 2018

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	107-810	**1.6** France — Ireland interconnection between La Martyre (FR) and Great Island or Knockraha (IE) [currently known as "Celtic Interconnector"]	**1.6** Brittany, most probably La Martyre (FR) to future 400 kV substation at Great Island or Knockraha (IE)	**1.6** EirGrid plc (IE) Réseau de Transport d'Electricité /RTE (FR)	**1.6** A new 320 kV – 500 kV (depending on the technology, to be fixed at a later stage in detailed design studies) HVDC subsea connection of approximately 600 km and with a capacity of around 700 MW between Ireland and France (offshore).	**1.6** Under consideration	**1.6** 2026
	153-987	**1.7.1** France—United Kingdom interconnection between Cotentin (FR) and the vicinity of Exeter (UK) [currently known as FAB project]	**1.7.1** Cotentin (FR) to the vicinity of Exeter (UK)	**1.7.1** FABLink Ltd, a joint venture of Transmission Investment (UK) and Alderney Renewable Energy; Réseau de Transport d'Electricité / RTE (FR)	**1.7.1** Two 220km HVDC Links with a capacity of 700MW each between France, Britain via the island of Alderney, using Voltage Source Converters in balanced monopole configuration with XLPE or MI cables -	**1.7.1** Permitting	**1.7.1** 2021
	25-62	**1.7.2** France — United Kingdom interconnection between Tourbe (FR) and Chilling (UK) [currently known as "IFA2" project]	**1.7.2** Caen area, most likely Tourbe (FR) to Chilling (UK)	**1.7.2** National Grid Interconnector Holdings Limited (UK) Réseau de Transport d'Electricité/RTE (FR)	**1.7.2** New subsea 320 kV – 390kV HVDC link with a capacity of around 1000 MW (depending on technology to be fixed at a later stage in detailed specification and competitive procurement processes) between the UK and France (offshore).	**1.7.2** Permitting	**1.7.2** 2020
	172-1005	**1.7.3** France — United Kingdom interconnection between Coquelles (FR) and Folkestone (UK) [currently known as "ElecLink" project]	**1.7.3** Coquelles (FR) to Folkestone (UK)	**1.7.3** ElecLink Limited	**1.7.3** A new 51 km 320 kV DC electricity interconnector with a capacity of 1000 MW between Coquelles and Folkestone, via the Channel Tunnel (onshore and offshore).	**1.7.3** Under construction	**1.7.3** 2019
	247.1381	**1.7.4** Interconnection between Le Havre (FR) and Lovedean (UK) [currently known as "AQUIND"]*	**1.7.4** Barnabos (in the region of Le Havre) (FR) to Lovedean (UK)	**1.7.4** Aquind Ltd	**1.7.4.** AQUIND Interconnector is a new 320kV HVDC (VSC) subsea and underground power transmission link between the United Kingdom and France with the total net capacity of 2000MW. The interconnector will connect to the GB grid at Lovedean substation in the South of England and to the French grid – at Barnabos substation in Normandy.	**1.7.4** Planning	**1.7.4** 2020
	285.1383	**1.7.5** Interconnection between the vicinity of Dunkerque (FR) and the vicinity of Kingsnorth (UK) [currently known as "Gridlink"]*	**1.7.5** Dunkerque (FR) to the vicinity of Kingsnorth (UK)	**1.7.5** Elan Energy Ltd	**1.7.5** UK - France 1.5GW HVDC (VSC) Interconnector. The GridLink project is a 1.4GW HVDC (VSC) interconnector between the UK (Kingsnorth) and France (Warande)" Substations in Kemsley (Sittingbourne, UK) and Warande (Gravelines, France)	**1.7.5** Planning	**1.7.5** 2021

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1.8		**1. 8** Cluster Germany — Norway [currently known as "NordLink"]					
	37-142	**1.8.1** Germany — Norway interconnection between Wilster (DE) and Tonstad (NO) [currently known as "NordLink"]	**1.8.1** Tonstad / Ertsmyra substation (NO) to Wilster (DE)	**1.8.1.**Statnett SF (NO) TenneT TSO GmbH, KfW (DE)	**1.8.1** A new HVDC subsea cable of 525 kV, 514 km and with a capacity of 1400 MW between Southern Norway and Northern Germany ((total length onshore and offshore 623 km)).	**1.8.1** Under construction	**1.8.1** 2020
	37.406	**1.8.2** Reinforcement of internal lines in southern Norway*	**1.8.2** Southern Norway (NO)	**1.8.2** Statnett SF (NO)	**1.8.2** Voltage uprating of existing 300 kV line Sauda/Saurdal - Lyse - Tonstad - Feda - 1&2, Feda - Kristiansand; Sauda-Samnanger in long term. Voltage upgrading of existing single circuit 400kV OHL Tonstad-Solhom-Arendal. Reactive power devices in 400kV substation	**1.8.2** Under construction	**1.8.2** 2019-2021
1.10	110-424 190-1033	**1.10.1** Norway — United Kingdom interconnection	**1.10.1** Blythe (UK) to Kvilldal (NO)	**1.10.1** Statnett SF (NO) National Grid Interconnector Holdings Limited (UK) NorthConnect KS (UK)	**1.10.1** A new subsea HVDC interconnection with a capacity of 1400 MW between Norway and the United Kingdom.	**1.10.1** Under construction	**1.10.1** 2021
	190-1382	**1.10.2** Interconnection between Peterhead (UK) and Simadalen (NO) [currently known as "NorthConnect"]*	**1.10.2** Peterhead (UK) to Simadalen (NO)	**1.10.2** NorthConnect KS (UK)	**1.10.2** A new subsea HVDC interconnection with a capacity of 1400 MW between Norway and the United Kingdom	**1.10.2** Permitting	**1.10.2** 2022
1.13	214-1082	**1.13** Interconnection between Iceland and United Kingdom [currently known as "Ice Link"]	**1.13** Iceland to UK	**1.13** National Grid Interconnector Holdings Limited (UK) Landsnet hf (IC) Landsvirkjun (IC)	**1.13** A new HVDC subsea cable of approximately 1000 km and with a capacity of approximately 800-1200 MW between the UK and Iceland (onshore and offshore), Further details of technology and voltage to be fixed at a later stage.	**1.13** Under consideration	**1.13** 2027
1.14	167-998	**1.14** Interconnection between Revsing (DK) and Bicker Fen (UK) [currently known as "Viking Link"]	**1.14** Revsing (DK) to Bicker Fenn (UK)	**1.14** National Grid Interconnector Holdings Limited (UK) Energinet.dk (DK)	**1.14** A new HVDC subsea cable of 500 kV, approximately 740 km and with a capacity of up to 1400 MW between the UK and Denmark (onshore and offshore).	**1.14** Permitting	**1.14** 2022
1.15	121.934	**1.15** Interconnection between the Antwerp area (BE) and the vicinity of Kemsley (UK)*	**1.15** Between BE and UK	**1.15** Elia (BE) and National Grid Interconnector Holdings Limited (UK);	**1.15** This project considers the possibility of a ~ 1 - 1.4 second HVDC interconnector between UK and Belgium at the earliest by 2028 (indicative timing). The timing as well as location, routing, capacity are subject to further studies. In this context, Elia and NGIHL are conducting a bilateral feasibility study.	**1.15** Under Consideration	**1.15** 2028
1.16	260.1255	**1.16** Interconnection between Netherlands and United Kingdom*	**1.16** Netherlands to United Kingdom	**1.16** National Grid Interconnector	**1.16** This project considers the possibility of a second 1 GW HVDC connection, between UK and the	**1.16** Under consideration	**1.16** 2030

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				Holdings Limited (UK); TenneT TSO BV (NL)	Netherlands. The determination of the optimal capacity, location, technology, potentially needed internal grid reinforcements as well as possible synergies with the development of offshore capacity and the long-term concept of a "west-east corridor" in the North Sea area are subject of further studies		
Priority Corridor North-South Electricity Interconnections in Western Europe ('NSI West Electricity')							
	92-146	**2.2.1** First interconnection between Lixhe (BE) and Oberzier (DE)	**2.2.1** Lixhe, Liège area (BE) to Oberzier, Aachen / Düren region (DE)	**2.2.1** Elia System Operator SA (BE), Amprion GmbH (DE)	**2.2.1** Connection between Lixhe (BE) and Oberzier (DE) including a new 90 km HVDC 1GW underground cable (voltage: ±320kV) and the extension of existing 380 kV substations.	**2.2.1** Permitting	**2.2.1** 2020
	225.1107	**2.2.4** Second interconnection between Belgium and Germany *****	2.2.4	**2.2.4** Elia System Operator SA (BE), Amprion GmbH (DE)	**2.2.4** 2nd interconnector BE-DE: envisions the possibility of a second ~ 1GW HVDC interconnection between Belgium and Germany at the earliest by 2028 (indicative timing). The exact timing as well as location, routing, capacity are subject to further studies. In this context, Elia and Amprion are conducting a bilateral feasibility study.	**2.2.4** Planning	**2.2.4** 2025
2.4	299*.1458	**2.4** Interconnection between Codrongianos (IT), Lucciana (Corsica, FR) and Suvereto (IT) [currently known as "SACOI 3"]	**2.4** Codrongianos (FR) to Suvereto (IT)	**2.4** Terna Rete Elettrica Nazionale S.p.A. (IT) ; EDF (FR)	**2.4** The project will replace the existing link (SACOI 2) close to the end of its lifetime. The project consists in a revamping of the HVDC link and new DC/AC converter stations in Corsica, Tuscany and Sardinia replacing the existing ones. The new HVDC converter stations will ensure an improvement in technological performance and an increase of the transmission capacity among the three areas involved.	**2.4** Design and permitting	**2.4** 2023
	21-55	**2.5.1** Interconnection between Grande Ile (FR) and Piossasco (IT) [currently known as Savoie-Piemont project]	**2.5.1** Grande Ile (FR) to Piossasco (IT), via Frejus motorway tunnel	**2.5.1** Terna - Rete Elettrica Nazionale SpA (IT), RTE - Réseau de Transport d'Electricité (FR)	**2.5.1** New 190 km HVDC (VSC) interconnection between Grande Ile (FR) and Piossasco (IT) via a 320 kV underground cable and converter stations at both ends (two poles, each of them for a 600 MW power capacity). The cables will be laid in the security gallery of the Frejus motorway tunnel and mainly along the existing motorways.	**2.5.1** Under construction	**2.5.1** 2019
2.7	16-38	**2.7** Interconnection between Aquitaine (FR) and the Basque country (ES) [currently known as "Biscay Gulf"]*	**2.7** Nouvelle Aquitaine (FR) to the Basque Country (ES)	**2.7** RTE - Réseau de Transport d'Electricité (FR), REE - Red Eléctrica de España S.A. (ES)	**2.7** New 320 kV or 500 kV (voltage tbd) HVDC subsea cable interconnection of approximately 370 km with a capacity of 2000 MW (tbc) between Nouvelle Aquitaine and the Basque country, via the the Biscay Gulf (offshore).	**2.7** Permitting	**2.7** 2025
2.9	254-660	**2.9** Internal line between Osterath and Philippsburg (DE) to increase capacity at Western borders [currently known as "Ultranet"]	**2.9** Osterath to Philippsburg (DE)	**2.9** Amprion GmbH (DE) TransnetBW GmbH (DE)	**2.9** New 400 HVDC lines (OHL) with a length of 40 km and 300 km of existing routes with new technology and with a total capacity of 2000 MW from Osterath to Philippsburg to integrate new wind generation especially from North/Baltic Sea towards Central-South for consumption and storage (onshore).	**2.9** Planned, but not yet in permitting	**2.9** 2021

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2.10	235-664	**2.10** Internal line between Brunsbüttel-Groβgartach and Wilster-Grafenrheinfeld (DE) to increase capacity at Northern and Southern borders [currently known as "Suedlink"]*	**2.10** Brunsbüttel (DE) to Groβgartach (DE) and Wilster (DE) to area Grafenrheinfeld (DE)	**2.10** TenneT TSO GmbH (DE) TransnetBW GmbH (DE)	**2.10** New HVDC connection with a total capacity of 4 GW, with one line having a length according to the suggested corridor route of approx. 700 km and the other of 550 km, to integrate new wind generation from Northern Germany towards Southern Germany and Southern Europe for consumption and storage (onshore).	**2.10** Planned, but not yet in permitting	**2.10** 2025
2.13		Cluster Ireland — United Kingdom interconnections, including one or more of the following PCIs:					
	81-462	**2.13.1** Ireland — United Kingdom interconnection between Woodland (IE) and Turleenan (UK)	**2.13.1** Woodland (IE) to Turleenan, Northern Ireland (UK)	**2.13.1** EirGrid; System Operator for Northern Ireland Ltd/SONI (UK)	**2.13.1** A new 400 kV AC single circuit (OHL) of 138 km and with a capacity of 1,500 MVA between Turleenan 400/275 kV in Northern Ireland (UK) to Woodland 400/220 kV (IE) (onshore).	**2.13.1** Permitting	**2.13.1** 2020
	82-463, 896, 897	**2.13.2** Ireland — United Kingdom Interconnection between Srananagh (IE) and Turleenan (UK)	**2.13.2** Srananagh in Co. Sligo (IE) to Turleenan in Northern Ireland (UK)	**2.13.2** EirGrid plc	**2.13.2** A new cross border circuit of approximately 200 km at 220kV or greater with a capacity up to 710MVA between Srananagh 220/110 kV station in Co. Sligo (IE) and Turleenan 400/275 kV station in Northern Ireland (UK).	**2.13.2** Planned, but not yet in permitting	**2.13.2** 2029
Priority Corridor North-South Electricity Interconnections in Central Eastern and South Europe ('NSI East Electricity')							
3.10		Cluster Israel — Cyprus — Greece between Hadera and Attica region [currently known as "EUROASIA Interconnector"], including the following PCIs:			**3.10:** The project consists of a 500 kV DC underwater electric cable and any essential equipment and/or installation for interconnecting the Cypriot, Israeli and the Greek transmission networks (offshore). The project will have a capacity of 2000 MW and a total length of around 820 nautical miles/around 1518 km (329 km between CY and IL, 879 km between CY and Crete and 310 km between Crete and Athens). Converter stations will be of the Voltage Source Converter (VSC) and will allow for reverse transmission of electricity. The dumping depth of the cable in some areas between IL and CY is expected to reach 2200 m and the respective depth in some areas between CY and EL is expected to reach 3000 m.		
	219-1407	**3.10.1** Interconnection between Hadera (IL) and Kofinou (CY)*	**3.10.1** Hadera (IL) to Kofinou (CY)	**3.10.1** EuroAsia Interconnector Ltd		**3.10.1** Permitting	**3.10.1** 2022
	219-1409	**3.10.2** Interconnection between Kofinou (CY) and Korakia, Crete (EL)*	**3.10.2** Kofinou (CY) to Korakia (EL)	**3.10.2** Euro Asia Interconnector Ltd		**3.10.2** Permitting	**3.10.2** 2021
3.12	130-665	**3.12** Internal line in Germany between Wolmirstedt and Bavaria to increase internal North-South transmission	**3.12** Wolmirstedt (DE) to Bavaria (either Gundremmingen or Isar) (DE)	**3.12** 50Hertz Transmission (DE) TenneT TSO	**3.12** New HVDC connection with a capacity of minimum 2 GW from North-East Germany (Area of Wolmirstedt,	**3.12** Planned but not yet in permitting	**3.12** 2025

		capacity		GmbH (DE)	with high installed capacities of RES), to the South of Bavaria (area of Isar with high consumption and connections to storage capabilities. Further investigations for capacity extension are ongoing (see TYNDP project 130). There was a change in technical layout due to German law: project promoters are obliged to build this connection as underground cable. Current planning investigates the execution of a 540 km HVDC underground cable system (525 kV or 320 kV). .		
3.27	29 .635	**3.27** Interconnection between Sicily (IT) and Tunisia node (TU) [currently known as "ELMED"]*	**3.27**Sicily (IT) to Tunisia (TU)	**3.27** TERNA ENERGY S.A (IT)	**3.27** ELMED is New interconnection between Tunisia and Sicily via HVDC submarine cable to increase the interconnection capacity of the Euro-Mediterranean system and to reduce limitations to the power exchanges on the northern Italian border, with France, Switzerland, Austria and Slovenia, and therefore it will allow to significantly increase the transmission capacity and its exploitation by at least 500 MW on that boundary	**3.27** Planning	**3.27** 2022
Priority Corridor Baltic Energy Market Interconnection Plan ('BEMIP Electricity')							
4.1	36-141	**4.1** Denmark — Germany interconnection between Tolstrup Gaarde (DK) and Bentwisch (DE) via offshore windparks Kriegers Flak (DK) and Baltic 1 and 2 (DE) [currently known as "Kriegers Flak Combined Grid Solution"]	**4.1** Ishøj / Bjæverskov (DK) to Bentwisch (DE)	**4.1** 50Hertz Transmission GmbH (DE) Energinet (DK))	**4.1** The Kriegers Flak Combined Grid Solution is a new 400 MW offshore interconnection between Bentwisch (DE) and Tolstrup Gaarde (DK) via the offshore wind farms Kriegers Flak (DK), Baltic 1 and 2 (DE). As eastern Denmark and Germany are two different synchronous areas, The frequency transformation is nec essary. T h is will be done by two voltag e sourc e c onverters (VSC) that c onvert th e alternating current (AC) from th e Nordic synchronous area into direct current (DC) and direc tly b ac k to AC, now adapted to th e European sync h ronous are The project envisages three main components: 400MW HVDC VSC B2B converter station, offshore substations, approximately 2x25 km sea cables with a voltage of 150 kV , extention of onshore substations, C-T ype-Filter (MSCDN) and shunt reactor..	**4.1** Under construction	**4.1** 12/2018

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12. Cross-border carbon dioxide network

No		Definition	Details on location	Promoter(s)	Type / technology employed	Implementation status	
12.1		**12.1** Teesside CO2 hub (United Kingdom,in further phases Netherlands, Belgium, Germany)	**12.1** Teesside (UK); Antwerp (BE), Rotterdam (NL), Rhine (DE)	**12.1** Tees Valley (Combined Authority)	**12.1** <u>**Dedicated pipelines, other than upstream**</u> 1. Shared onshore pipeline connecting capture sites on Teesside. 2. Shared capacity offshore pipe with booster facilities connecting to a UK store for permanent geological storage, currently assumed to be at the Bunter Aquifer. **Facilities for liquefaction and buffer storage of carbon dioxide in view of its further transportation** 1. Shared capacity import/export CO2 shipping terminal on Teesside with liquefaction, loading, storage, heating and pumping facilities for injection into shared pipe to store. 2. Export terminal at Antwerp with storage and liquefaction equipment for onward ship transport to Teesside import terminal and final injection into shared offshore pipe. 3. Barge based CO2 terminals with storage and liquefaction equipment on the German Rhine to barge CO2 to Rotterdam terminal. 4. Loading and export terminal at Rotterdam to receive barged CO2 from Germany for onward ship transport to the Teesside import terminal for final injection into a shared offshore pipe. **Any equipment or installation essential for the system** To be determined	**12.1** Feasibility studies	**12.1** Shared onshore and offshore pipe : 2025 CO2 import/export terminal in Teesside, import/export terminal in Rotterdam, and export terminal in Antwerp: 2030

12.2		**12.2.** CO2-Sapling Transport and Infrastructure Project (United Kingdom,in further phases Netherlands, Norway)	**12.2** St Fergus gas plant in North East UK to Captain X storage site in the Central North Sea (UK),in further phases Netherlands, Norway	**12.2.** Pale Blue Dot Energy Ltd (UK)	**12.2 Dedicated pipelines, other than upstream** The project is the transportation infrastructure component of the Acorn full chain Carbon Capture and Storage (CCS) project and its subsequent national and international build out programme. It is the international carbon dioxide (CO2) transportation network that will grow out of the Acorn CCS project. It will use existing North Sea gas pipelines that are no longer required for petroleum use as a dedicated transportation infrastructure for captured CO2. **Facilities for liquefaction and buffer storage** The project will develop new liquefaction and buffer storage facilities at the Peterhead Port and further compression plant at the St Fergus gas terminal, both on the North East coast of the UK, with additional	**12.2.** Under consideration	**12.2.** Phase 1 - 2022 Q1 – Phase 2 – 2024 Q1 – Phase 3 – 2027 Q1 -

					modular facilities being constructed as required; St. Fergus identified as hub location. **Any equipment or installation essential for the system** Re-purposing existing gas pipelines that have many of the necessary control and monitoring systems in place. It will adopt the existing practices of maintenance and replacement as necessary		
12.3		**12.3** The Rotterdam Nucleus (Netherlands and United Kingdom)	**12.3** Well defined locations off-shore in NL and UK	**12.3** Havenbedrijf Rotterdam N.V (NL)	**12.3 Dedicated pipelines, other than upstream** The project involves dedicated pipelines used to transport CO2 from large point sources in the Port of Rotterdam and from offshore natural gas processing facilities for geological storage according to Directive 2009/31/EC. It is to provide large scale CO2 transportation to well-defined CO2 storage capacity within 20km of the Dutch coast, and to several hundreds of megatonnes of storage further offshore **Facilities for liquefaction and buffer storage** Potentially relevant for future expansion of the project, however not included in current version of the Rotterdam Nucleus **Any equipment or installation essential for the system** Compression, safety and monitoring equipment is needed for the operation of the CO2 pipelines	**12.3** First phase (onshore collection + P18 storage field), we are working towards FID in 2018/2019	**12.3** 2022-2024
12.4		**12.4** CO2 cross-border transport connections between emission sources in United Kingdom and Netherlands and a storage site in Norway	**12.4** Teesside industrial area (UK) Eemshaven area (NL) and a storage site in Norway (NO)	**12.4** Statoil ASA (NO)	**12.4 Dedicated pipelines, other than upstream** n.a. **Facilities for liquefaction and buffer storage and any equipment or installation essential for the system** The CO2 transport connections of the project will be by ship. This connection will require facilities for liquefaction and buffer storage of carbon dioxide in view of its further transportation from the sites in Teesside (UK) and the Eemshaven (NL). At the receiving end (N) CO2 will be offloaded into onshore storage buffering tanks prior to further transport by pipe to the offshore storage site. The onshore facilities will include: • Quay for on and offloading transport ship • Equipment for transfer of liquid CO2 from quay to storage tanks • Interim storage tanks • Process systems required to bring the liquid CO2 from storage conditions to injection conditions (pumps, heat exchangers, heating medium systems, etc.)	**12.4** Under consideration	**12.4** 2023

					• Process systems required to vaporize CO2 for return to storage tanks to replace volume of injected liquid • Utility systems required to support the storage and injection facility		