Project Sheet

ZuidWest380 NL Oost

Project type	transmission
Project id	346
Created by	
Created on	Feb 11, 2021 12:14:43 PM

Index

Key Information 3
Description 3
Project Description & Context 4
Project Investments 4
System Needs addressed by the project 4
Interconnection targets 5
Project Assessment 8
Transfer capacity increase (National Trends 2025) 8
CBA results 8
Central scenario: National Trends 8
Scenarios: Distributed Energy & Global Ambition 10
Non scenario-dependent indicator(s) 11
Sensitivity Study: Current Trends 12
Residual impact 13
Project Costs 13

ENTSOE

Key Information

Internal Project
AC transmission line
New

In Permitting

Description

New 380 kV connection between Rilland and Tilburg including new substation.

Project promoters

TENNET-NL

Countries

Belgium
Netherlands

National development plan(s)

Samenvatting KCD 2017, The Netherlands, page 22

Additional information on the project

http://www.zuid-west380kv.nl/
(in Dutch)

Project sheet backlog

6 Nov. 2020 - Publication as part of the draft TYNDP 2020 package for consultation

Project Description & Context

Project Investments

Main investment(s): New 380 kV substation Tilburg; New 380 kV double circuit line 2645MVA between Rilland and Tilburg

Type of element	Total route length (km)	From substation 1	To substation 2	Present status	Commissioning year	Progress of the investment	Explanation in case of delay or reclustering
AC transmission line	80	Rilland	Tilburg	In Permitting	2029	Rescheduled	

Is the project in the reference grid?

No

System Needs addressed by the project

Project promoter(s) selected up to 4 system needs that are addressed by their project in a predefined list. Available needs ranged from reduction of price differentials between countries, improvement of system flexibility and stability, enabling cost-efficient connection of high volumes of RES, improvement of voltage stability...
As part of the TYNDP 2020, ENTSO-E released a study investigating cross-border system needs in the 2030 and 2040 horizons.

Need		How the project addresses each need (explanation provided by the project promoter(s))
	Infrastructure to reduce price differentials between EU and/or non-EU countries	Upgrade of the internal grid helps increase the cross-border exchange capabilities Netherlands and Belgium reducing thus price differentials between these different bidding zones
	Infrastructure to facilitate and accommodate future scenarios, cross-border flows or loop flows.	Due to the change of the generation mix in both countries as well as the need to increase the interconnection capacity between the two countries, a new pattern of power flows will be created. This project, in combination with projects 262 and 297, helps facilitate these new needs and flow patterns
	Infrastructure designed to enable cost-efficient grid connection of high volumes of RES and/or reduce RES curtailment	By upgrading existing parts of the transmission grid, but also creating new corridors in it, a cost-efficient integration of large amounts of offshore wind production is implemented and thus reduces possible RES curtailment.

Interconnection targets

In 2017, the Interconnection Target Expert Group proposed alternative indicators to the 15% interconnection criteria for every country and electrified island with a new methodology developed collaboratively between the European Commission, ENTSO-E, ENTSOG, industry, universities and other experts. The methodology is based on three indicators:
1. Price differential between EU countries, with an objective to reduce it below 2 EUR/MWh
2. Ratio between nominal transmission capacity and installed RES capacity, with a target of past 30%
3. Ratio between nominal transmission capacity and peak load, with a target of past 30%

The following maps show the ITEG methodology applied to the TYNDP 2030 scenarios, with the 2020 grid.

ENTSOE

ENTSOE

Project Assessment

Transfer capacity increase (National Trends 2025)

	Border	A B	B A
Transfer capacity increase (in MW)	Belgium - Netherlands	1000	10000

CBA results

ENTSO-E has assessed the benefits delivered by each project in 2025 (scenario National Trends 2025) and in 2030 (three scenarios: National Trends, Distributed Energy and Global Ambition). Indicators B1 to B6 were computed by ENTSO-E, while promoters had the possibility to compute and submit so-called project-level benefits (B7 to B10). The benefits must be understood as benefits for Europe as a whole, not for the promoters of the project.
Results are presented per scenario.

Central scenario: National Trends

National Trends is the central policy scenario of the TYNDP2020, designed to reflect EU member state's National Energy and Climate Plans (NECP), in line with the requirement to meet current European 2030 energy strategy targets.

			Comparison of the COP21 scenarios with NT2030 average result		
	NT2025	**NT2030**	**DE2030 is < or > than NT2030**	**GA2030 is < or > than NT2030**	

Increase in socio-economic welfare

B1 Annual Socio-Economic Welfare (SEW) increase (M € / year)	max average min	7 6 5	19 17 14	>	<	ENTSO-E assessment
B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction	max average min	0 0 0	3 2 2	>	>	ENTSO-E assessment
B1_RES Annual Socio-Economic	max average	12 11	31 29	<	<	ENTSO-E assessment

Welfare increase resulting from RES integration	min	9	26			

Reduction of CO2 and GHG emissions

B4 Non-CO2 emissions (kg/year)

B4a Nitrogen oxides	average	-30	78	n/a	n/a	ENTSO-E assessment
B4b Ammonia	average	-3	6	n/a	n/a	ENTSO-E assessment
B4c Sulfur dioxide	average	-60	104	n/a	n/a	ENTSO-E assessment
B4d Particular matter 5	average	-2053	-7433	n/a	n/a	ENTSO-E assessment
B4e Particulate matter 10	average	0	11	n/a	n/a	ENTSO-E assessment
B4f Non-methane volatile organic compounds	average	-2056	-7437	n/a	n/a	ENTSO-E assessment

B2a Annual CO2 variation from market simulation (ktonnes / year)	max average min	-15 -15 -17	-74 -85 -96	< 	< 	ENTSO-E assessment
B2a_€ Annual Societal cost variation resulting from CO2 variation from market simulation monetised (M € / year)	CO2 price 60€/ ton 100€/ ton 189€/ ton	1 1 3	3 6 14	< > >	< > >	ENTSO-E assessment
B2b Annual CO2 variation due to network losses (ktonnes / year)	average	18	26	n/a	n/a	ENTSO-E assessment
B2b_€ Annual Societal cost variation resulting from	CO2 price 60€/ ton 100€/	0 -1 -3	-1 -2 -4	n/a	n/a	ENTSO-E assessment

CO2 variation from network simulation monetised (M € / year)	ton 189€/ ton					

Integration of renewable energy sources

B3 Annual avoided curtailment (RES integration) (GWh / year)	max average min	264 228 187	830 770 670	< 	< 	ENTSO-E assessment
B3a Connected RES (MW)	-			n/a	n/a	ENTSO-E assessment

Impact on grid losses

B5 Variation of network losses (GWh / year)	average	70	122	n/a	n/a	ENTSO-E assessment
B5_€ Variation of network losses monetised (M€ / year)	average	1	1	n/a	n/a	ENTSO-E assessment

Security of supply

B6 Annual reduction in Energy Not Served (MWh / year)	max average min		1550	n/a	n/a	ENTSO-E assessment
B6_€ Annual Socio-Economic Welfare increase resulting from reduction in Energy Not Served monetised (M€ / year)	average	n/a	15.5	>	n/a	ENTSO-E assessment

Scenarios: Distributed Energy & Global Ambition

DE and GA are two scenarios created in line with the COP21 targets to understand the impact on infrastructure needs agains different pathways reducing EU-28 emissions to net-zero by 2050. For these two scenarios, projects were assessed with a subset of CBA parameters.

		DE2030	GA2030	

Increase in socio-economic welfare

B1 Annual Socio-Economic Welfare (SEW) increase (M€ / year)	average	21	15	ENTSO-E assessment
B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction	average	16	4	ENTSO-E assessment
B1_RES Annual Socio-Economic Welfare increase resulting from RES integration	average	12	13	ENTSO-E assessment

Reduction of CO2 and GHG emissions

B2a Annual CO2 variation from market simulation (ktonnes / year)	average	-298	-117	ENTSO-E assessment
B2a_€ Annual Societal cost variation resulting from CO2 variation from market simulation monetised (M€ / year)	CO2 price 60€/ ton 100€/ ton 189€/ ton	2 14 40	3 8 18	ENTSO-E assessment

Integration of renewable energy sources

B3 Annual avoided curtailment (RES integration) (GWh / year)	average	254	297	ENTSO-E assessment
B3a Connected RES (MW)	-			ENTSO-E assessment

Non scenario-dependent indicator(s)

B8.0 Stability (Transient, Voltage and Frequency Stability)	Transient stability	Voltage stability	Frequency stability	
ZuidWest3808 Oost (New AC line)	++	++	0	Qualitative assessment by ENTSO-E based on information on the project technology provided by the project promoter(s). This indicator is not dependent on scenarios or time horizons.

Sensitivity Study: Current Trends

'Current Trends' describes a future where the energy transition is slower than planned.

		CT2030	

Increase in socio-economic welfare

B1 Annual Socio-Economic Welfare (SEW) increase (M€ / year)	average	8	ENTSO-E assessment
B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction	average	2	ENTSO-E assessment
B1_RES Annual Socio-Economic Welfare increase resulting from RES integration	average	14	ENTSO-E assessment

Reduction of CO2 and GHG emissions

B2a Annual CO2 variation from market simulation (ktonnes / year)	average	-74	ENTSO-E assessment
B2a_€ Annual Societal cost variation resulting from CO2 variation from market	CO2 price 60€/ton 100€/ton 189€/	2 5 12	ENTSO-E assessment

simulation monetised (M€ / year) ton		

Integration of renewable energy sources

B3 Annual avoided curtailment (RES integration) (GWh / year) average	258	ENTSO-E assessment
B3a Connected RES (MW) -		ENTSO-E assessment

Residual impact

Information on the residual impact of the project was provided by the project promoter(s).

Residual environmental impact

Investment	Investment status	Distance (km)	Type of sensitivity

Additional information by the project promoter(s)

The route with this connection has not yet been laid down in an (irrevocable) national integration plan.

Residual social impact

Investment	Investment status	Distance (km)	Type of sensitivity

Additional information by the project promoter(s)

The route with this connection has not yet been laid down in an (irrevocable) national integration plan.

Project Costs

The project costs were provided by the project promoter(s).

	CAPEX (Meuro)	Uncertainty range (%)	OPEX
1544. ZuidWest3808 Oost	1090	10%	5.5
Total	1090		5.5

Explanation provided by the project promoter on the CAPEX uncertainty range:

1544