# Project Sheet

Reschenpass Interconnector Project

| | |
|---|---|
| Project type | transmission |
| Project id | 26 |
| Created by | |
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# Key Information

## Cross Border Project
## AC transmission line
## New

## Under Construction

### Description

New 220kV interconnector between the substations Nauders (AT) and Glorenza (IT).

Due to an update of the list of cross-border projects interconnecting Italy with other Member States within 2020, the 2020 interconnection ratio of Italy has been updated accordingly (from previous value of 9% computed by ENTSO-E in TYNDP 2018 to roughly 8%). As the Interconnection level of 10% will not be reached by 2020, Italy is requested to investigate options of further interconnections.

### Project promoters

Austrian Power Grid
TERNA

### Countries

Austria
Italy

### National development plan(s)

Avanzamento piani di sviluppo precedenti Terna 2015/pag.192, Italy; APG Netzentwicklungsplan 2019, AT, 2019, 11-12, 48,
https://www.apg.at/de/Stromnetz/Netzentwicklung

### Additional information on the project

National development plan APG:

http://www.apg.at/de/netz/netzausbau/Netzentwicklungsplan

National development plan Terna:

http://www.terna.it/it-it/sistemaelettrico/pianodisviluppodellarete/pianidisviluppo.aspx

### 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): interconnector IT-AT

| 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 | 26 | Nauders (AT) | Glorenza (IT) | Under Construction | 2023 | Rescheduled | Delay in Permitting procedure |

## Is the project in the reference grid?

Yes

## 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 | This project contributes to lower the price differentials between Italian market zones and Austria |
| | Infrastructure designed to enable cost-efficient grid connection of high volumes of RES and/or reduce RES curtailment | This project will improve the integration of italian RES generation |
| ITEG | Infrastructure to tackle a Need identified by one of the European ITEG indicators referring to the 15% interconnection target for 2030:1. Reduce the price differential between EU countries to below 2EUR/MWh.2. Contribute to pushing ratio between nominal transmission capacity and installed RES capacity past 30%.3. Contribute | This project helps Italy to reach the 15% interconnection target by 2030 |

| Need | | How the project addresses each need (explanation provided by the project promoter(s)) |
|---|---|---|
| | to pushing ratio between nominal transmission capacity and peak load past 30%. | |
| | Infrastructure to address system adequacy deficiencies and/or mitigate the risk of power failures. | This project will contribute to reduce system adequacy deficiencies by increasing transmission capacity. |

## 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.

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# Project Assessment

## Transfer capacity increase (National Trends 2025)

| | Border | A B | B A |
|---|---|---|---|
| Transfer capacity increase (in MW) | Austria - Italy | 300 | 300 |

## Boundary capacity diagram

### Network boundary the projects helps mitigate

Italian peninsula integration

### Boundary capacity diagram

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## 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<br>average<br>min | 14<br>10<br>7 | 43<br>35<br>27 | < | < | ENTSO-E assessment |
| B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction | max<br>average<br>min | -2<br>-5<br>-12 | 8<br>-1<br>-8 | > | < | ENTSO-E assessment |
| B1_RES Annual Socio-Economic Welfare increase resulting from RES integration | max<br>average<br>min | 2<br>1<br>0 | 9<br>3<br>1 | > | < | ENTSO-E assessment |

## Reduction of CO2 and GHG emissions

B4 Non-CO2 emissions (kg/year)

| | | | | | | |
|---|---|---|---|---|---|---|
| B4a Nitrogen oxides | average | 444 | -2833 | n/a | n/a | ENTSO-E assessment |
| B4b Ammonia | average | -7 | -225 | n/a | n/a | ENTSO-E assessment |
| B4c Sulfur dioxide | average | 727 | -1682 | n/a | n/a | ENTSO-E assessment |
| B4d Particular matter 5 | average | 811 | 38122 | n/a | n/a | ENTSO-E assessment |
| B4e Particulate matter 10 | average | 27 | -100 | n/a | n/a | ENTSO-E assessment |
| B4f Non-methane volatile organic compounds | average | 781 | 38210 | n/a | n/a | ENTSO-E assessment |

| | | | | | | |
|---|---|---|---|---|---|---|
| B2a Annual CO2 variation from market simulation (ktonnes / year) | | max<br>average<br>min | 507<br>227<br>96 | 269<br>53<br>-290 | <<br><br><br> | >>>> | ENTSO-E assessment |
| B2a_€ Annual Societal cost variation resulting from CO2 variation from market simulation monetised (M € / year) | CO2 price | 60€/ ton<br>100€/ ton<br>189€/ ton | -8<br>-17<br>-38 | -2<br>-4<br>-8 | >>>> | <<<< | ENTSO-E assessment |
| B2b Annual CO2 variation due to network losses (ktonnes / year) | | average | 120 | 59 | n/a | n/a | ENTSO-E assessment |
| B2b_€ Annual Societal cost variation resulting from CO2 variation from network simulation monetised (M € / year) | CO2 price | 60€/ ton<br>100€/ ton<br>189€/ ton | -4<br>-9<br>-21 | -2<br>-4<br>-9 | n/a | n/a | ENTSO-E assessment |

## Integration of renewable energy sources

| | | | | | | |
|---|---|---|---|---|---|---|
| B3 Annual avoided curtailment (RES integration) (GWh / year) | | max<br>average<br>min | 43<br>17<br>0 | 245<br>85<br>22 | <<<< | 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 | 241 | 149 | n/a | n/a | ENTSO-E assessment |
| B5_€ Variation of network losses monetised (M€ / | | average | 11 | 5 | n/a | n/a | ENTSO-E assessment |

| | | | | | |
|---|---|---|---|---|---|
| year) | | | | | |

### Security of supply

| | | | | | | |
|---|---|---|---|---|---|---|
| B6 Annual reduction in Energy Not Served (MWh / year) | max<br>average<br>min | | 59 | 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 | 0.59 | > | 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 | 15 | 18 | ENTSO-E assessment |
| B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction | average | 6 | -12 | ENTSO-E assessment |
| B1_RES Annual Socio-Economic Welfare increase resulting from RES integration | average | 4 | 3 | ENTSO-E assessment |

### Reduction of CO2 and GHG emissions

| | | | | |
|---|---|---|---|---|
| B2a Annual CO2 variation from market | average | -112 | 333 | ENTSO-E assessment |

| | | | | |
|---|---|---|---|---|
| simulation (ktonnes / year) | | | | |
| B2a_€ Annual Societal cost variation resulting from CO2 variation from market simulation monetised (M€ / year) | CO2 price | 60€/ ton<br>100€/ ton<br>189€/ ton | 1<br>5<br>15 | -8<br>-22<br>-51 | ENTSO-E assessment |

### Integration of renewable energy sources

| | | | | |
|---|---|---|---|---|
| B3 Annual avoided curtailment (RES integration) (GWh / year) | average | 75 | 64 | ENTSO-E assessment |
| B3a Connected RES (MW) | - | | | ENTSO-E assessment |

## Benefits submitted by promoters based on scenarios other than the TYNDP2020 scenarios

| | 2025 | 2030 | |
|---|---|---|---|
| B7 System Flexibility – Balancing Energy Exchange | ++ | | Qualitative assessment by ENTSO-E, based on the study and values provided by the project promoter(s). ENTSO-E confirms the consistency of the proposed indicator with the CBA Guideline 3.0.<br>About the computation of this indicator by the project promoter(s) |

This indicator was computed based on Sustainable Transition (ST) , in a study performed by Terna in 2020. The promoter(s) stated that the submitted value was computed in accordance with the CBA Guideline and explained it as follows:

*The indicator B7, adopted in Italian NDP, defines the cost variation for dispatching services, with reference to reduction of internal congestion and ancillary services*

The promoter(s) certified that the values submitted and assessed in the study relate to countries located within the ENTSO-E perimeter only.

## Non scenario-dependent indicator(s)

| B8.0 Stability (Transient, Voltage and Frequency Stability) | Transient stability | Voltage stability | Frequency stability | |
|---|---|---|---|---|
| Reschenpass Interconnector (New AC line) | ++ | ++ | 0 | Qualitative assessment by ENTSO-E based on information on the project technology provided by the project promoter(s).<br>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 | 1 | ENTSO-E assessment |
| **Reduction of CO2 and GHG emissions** | | | |
| B2a Annual CO2 variation from market simulation (ktonnes / year) | average | 79 | ENTSO-E assessment |
| B2a_€ Annual Societal cost variation resulting from CO2 variation from market | CO2 price 60€/ton<br>100€/ton<br>189€/ | -3<br>-6<br>-13 | ENTSO-E assessment |

| | | | |
|---|---|---|---|
| simulation monetised (M€ / year) | ton | | |

### Integration of renewable energy sources

| | | | |
|---|---|---|---|
| B3 Annual avoided curtailment (RES integration) (GWh / year) | average | 16 | ENTSO-E assessment |
| B3a Connected RES (MW) | - | | ENTSO-E assessment |

### Comments on the CBA results by the project promoter(s)

About B2 CO2 emissions:

Results relative to CO2 emissions are strictly dependent on scenario assumptions (especially lifetime of lignite and coal power plants, that should be assessed from a perspective consistent with considered time horizons 2030 and 2040).

About B6 - Annual Socio-Economic Welfare increase resulting from reduction in Energy Not Served monetised):

In Italy a different parameter is used for the monetization of the Expected Energy Not Served (EENS) variation due to this project, because the current parameter used by ENTSOE in this project sheet (10 k€/MWh) is not compliant with National regulations in force in Italy n°627/2016 (“Minimum Requirements for the preparation of the Ten Year Development Plan of the National Transmission Network” according to which benefits related to reduction of EENS is monetized through a Value of Lost Load (VOLL) in a range between 20 k€/MWh and 40 k€/MWh.

## 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 |
|---|---|---|---|
| Reschenpass Interconnector | Under Construction | 0 | |

### Residual social impact

| Investment | Investment status | Distance (km) | Type of sensitivity |
|---|---|---|---|
| Reschenpass Interconnector | Under Construction | 2 | - |

## Project Costs

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

| | CAPEX (Meuro) | Uncertainty range (%) | OPEX |
|---|---|---|---|
| 614. Reschenpass Interconnector | 175 | 10 | 2.5 |
| Total | 175 | | 2.5 |

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

614 Uncertainty regarding extra costs due to safety, environmental or legal requirements imposed during permit grating process.

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