# Project Sheet

Lienz (AT) - Obersielach (AT)

| | |
|---|---|
| Project type | transmission |
| Project id | 1052 |
| Created by | Lea Dehaudt |
| Created on | Feb 11, 2021 5:16:24 PM |

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# Key Information

## Internal Project
## AC transmission line
## New

## Planned But Not Yet Permitting

### Description

The 380-kV-ring can be completed in Austria with the reinforcement of the Carinthia transmission grid. The advantages of a ring structure are only made possible by the project. Security of supply in Carinthia and Austria can be guaranteed in the long term. With the 380-kV-ring closure in the south, a redundant connection of the renewable energy feed-in centers in the east

Austria (mainly wind and PV) and the load centers with the pumped storage power plants in the central Alpine region. The 380-kV-ring closure is essential for the grid integration of renewable energies and the Austrian Federal Government's climate and energy strategy, and its necessity will also be addressed in the Carinthian Government's 2018-2023 program. The project will also enable the development of additional transmission capacity to the neighboring countries

### Project promoters

Austrian Power Grid

### Countries

Austria

## National development plan(s)

APG Netzentwicklungsplan 2019, AT, 2019, 11-14, 48, https://www.apg.at/en/Stromnetz/Netzentwicklung

## Additional information on the project

https://www.apg.at/en/Stromnetz/Netzentwicklung

## 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): upgrade from 220 kV to 380 kV

| 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 | 170 | Lienz (AT) | Obersielach (AT) | Planned But Not Yet Permitting | 2030 | Rescheduled | Tests and gaining of experience for novel technical solution in progress. |

## 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 improve system flexibility and stability e.g. improve system or local ramp rate, improve transient stability or RoCoF to meet system Needs. | Facilitation of capacities between RES and pump storages in Austria as well as optimisation of cross border flows. |
| | Infrastructure to facilitate and accommodate future scenarios, cross-border flows or loop flows. | Enabling future developments (load/ generation). |
| | Contribution to the power system's operational flexibility by controlling power flows and optimizing use of existing infrastructure | Faclilitation and optimisation of pump storage connections in the western part of Austria and therefore increasing flexibility. |
| | Infrastructure designed to enable cost-efficient grid connection of high volumes of RES and/or reduce RES curtailment | Connecting RES with pump storages. |

## 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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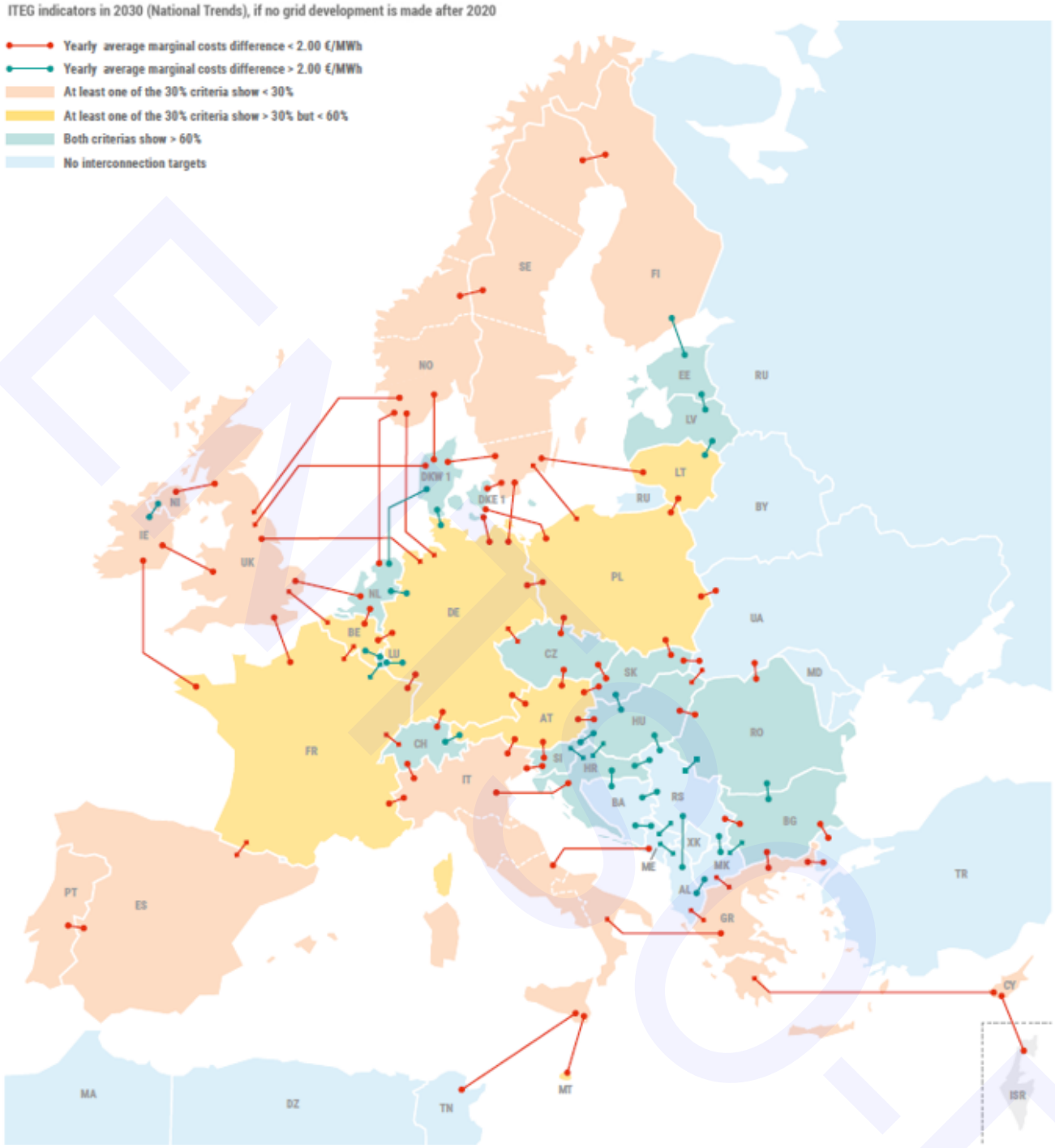
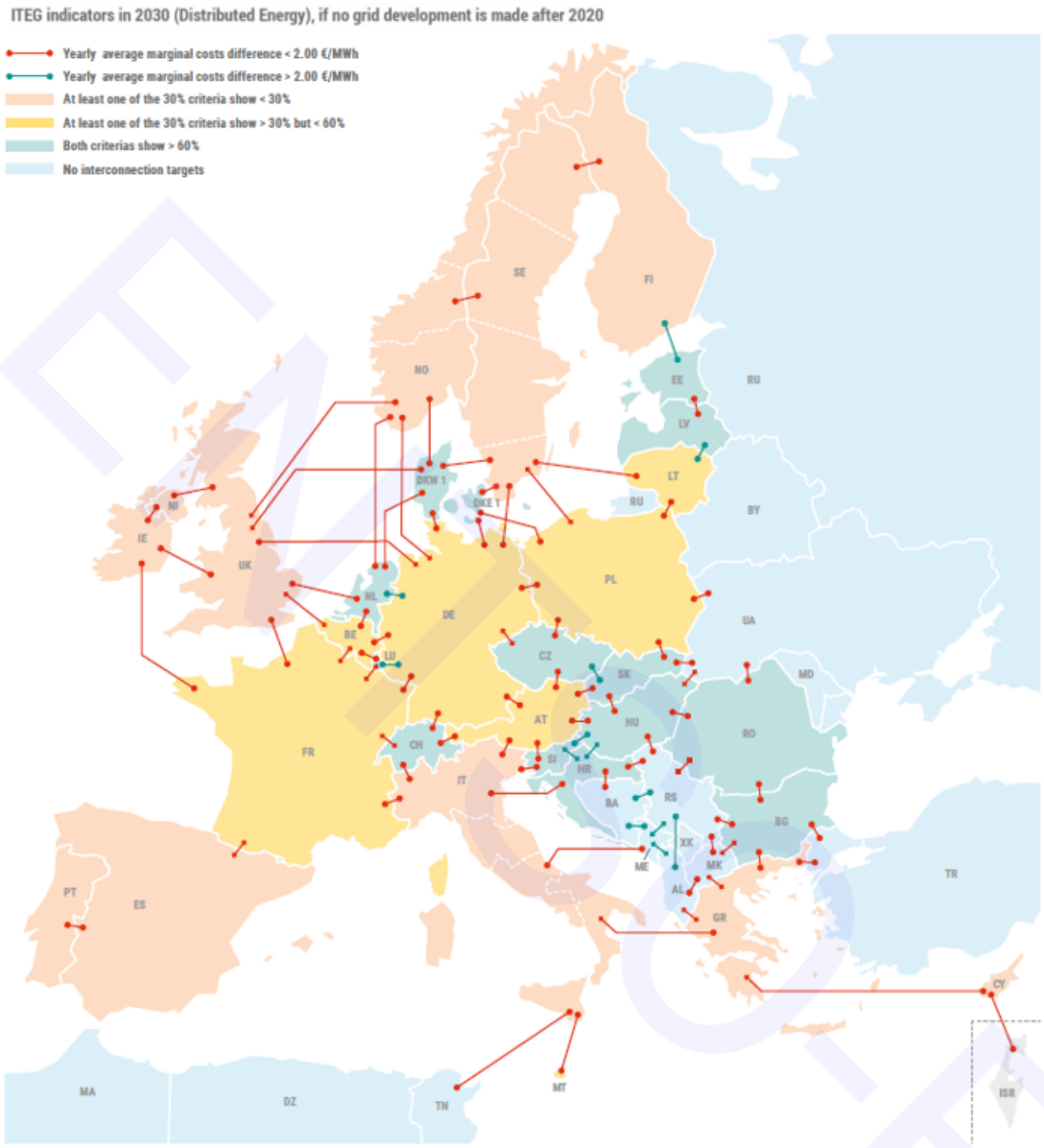
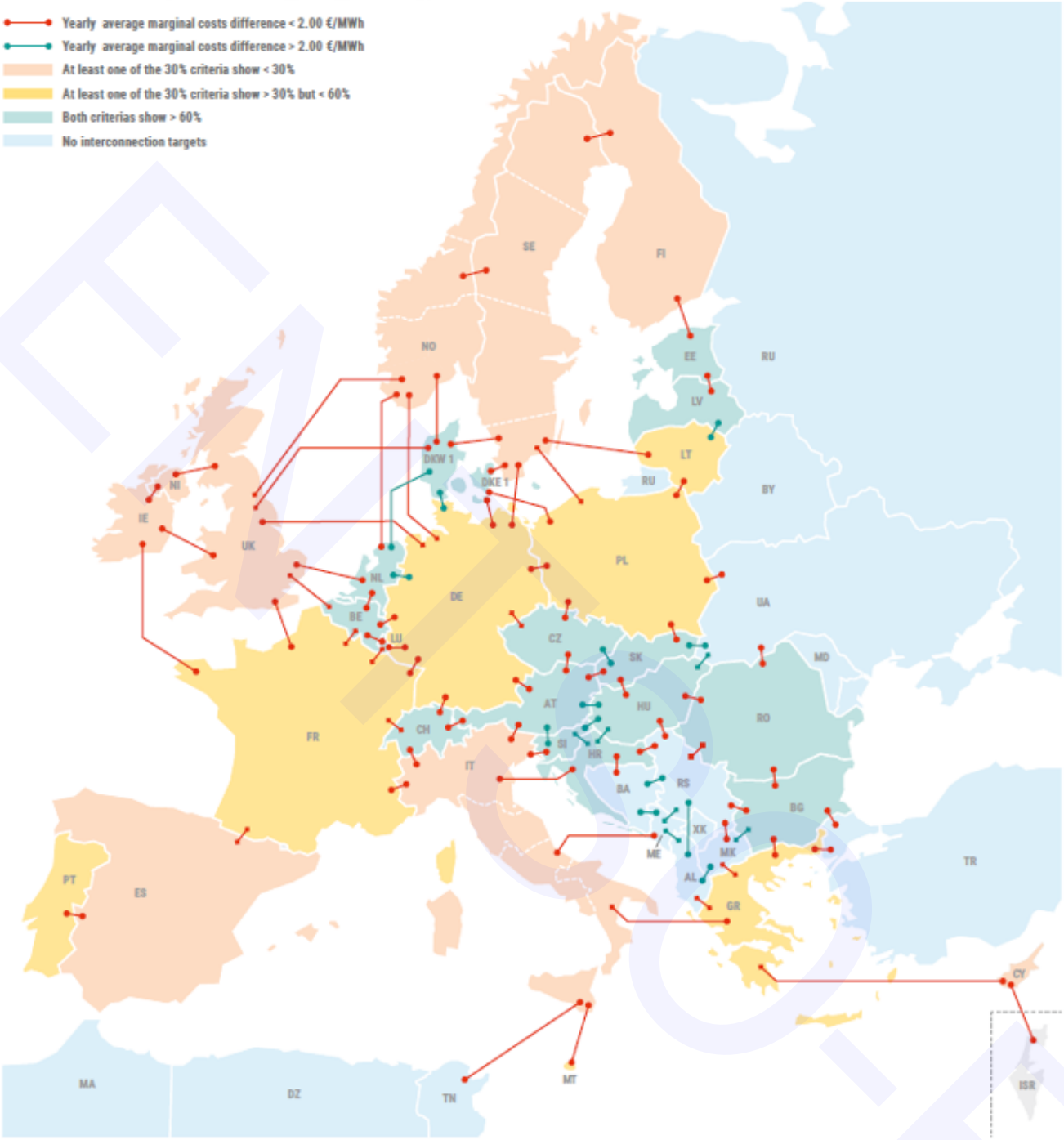

ITEG indicators in 2030 (National Trends), if no grid development is made after 2020
Yearly average marginal costs difference < 2.00 €/MWh
Yearly average marginal costs difference > 2.00 €/MWh
At least one of the 30% criteria show < 30%
At least one of the 30% criteria show > 30% but < 60%
Both criterias show > 60%
No interconnection targets
SE
FI
NO
EE
RU
LV
LT
DKW 1
DKE 1
RU
BY
NI
IE
UK
PL
NL
DE
UA
BE
LU
CZ
SK
MD
AT
HU
RO
FR
CH
SI
HR
IT
BA
RS
BG
XK
ME
MK
AL
TR
PT
ES
GR
CY
MA
DZ
TN
MT
ISR


ITEG indicators in 2030 (Distributed Energy), if no grid development is made after 2020
Yearly average marginal costs difference < 2.00 €/MWh
Yearly average marginal costs difference > 2.00 €/MWh
At least one of the 30% criteria show < 30%
At least one of the 30% criteria show > 30% but < 60%
Both criterias show > 60%
No interconnection targets
SE
FI
NO
EE
RU
LV
LT
DKW 1
DKE 1
RU
BY
NI
IE
UK
PL
NL
DE
UA
BE
LU
CZ
SK
MD
AT
HU
RO
FR
CH
SI
HR
IT
BA
RS
BG
XK
ME
MK
AL
TR
PT
ES
GR
CY
MA
DZ
TN
MT
ISR

ITEG indicators in 2030 (Global Ambition), if no grid development is made after 2020



# Project Assessment

## Transfer capacity increase (National Trends 2025)

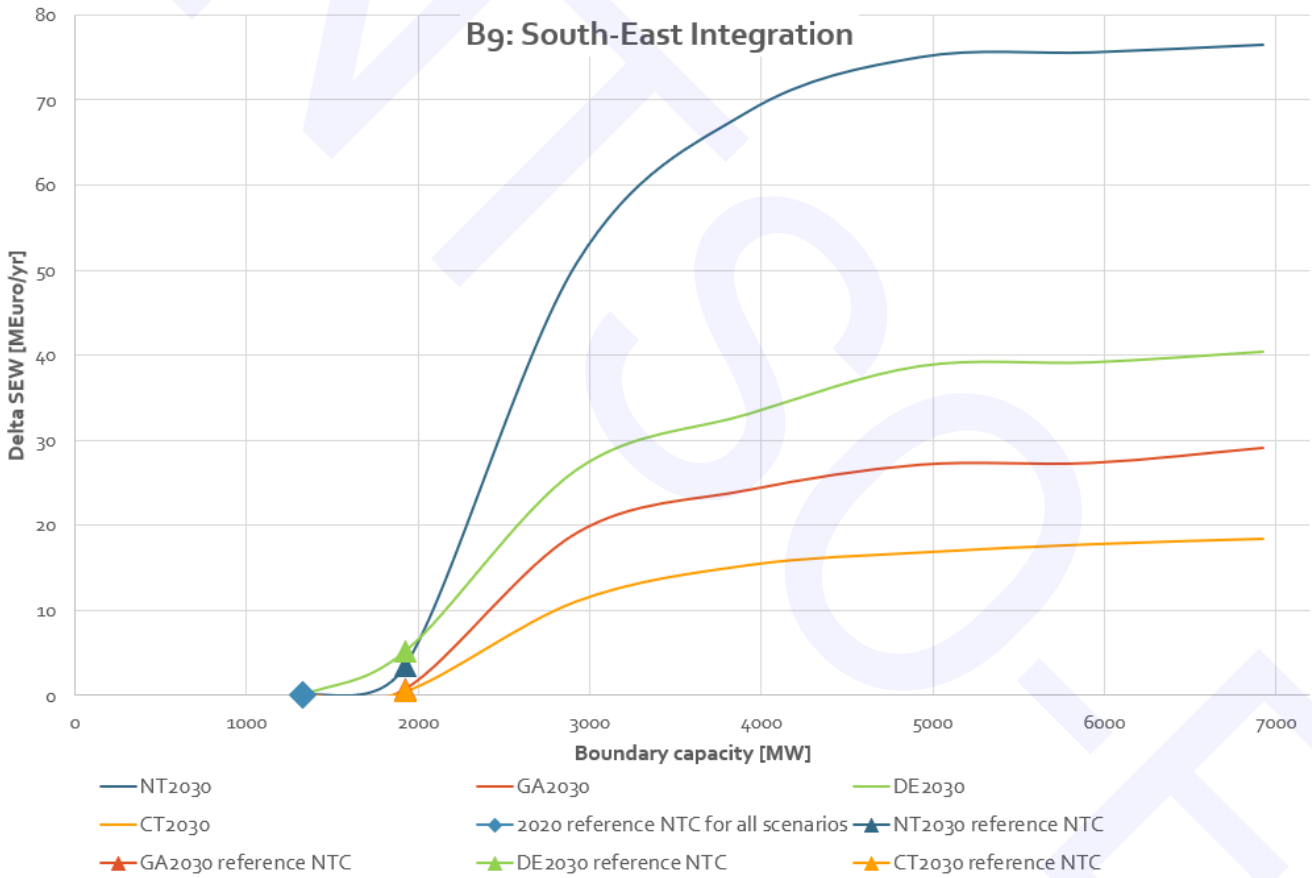
| | Border | A B | B A |
|---|---|---|---|
| Transfer capacity increase (in MW) | Austria - Slovakia | 500 | 500 |

## Boundary capacity diagram

### Network boundary the projects helps mitigate

South East integration

### Boundary capacity diagram




## 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 | 62<br>54<br>51 | 113<br>110<br>106 | < | < | ENTSO-E assessment |
| B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction | max<br>average<br>min | 6<br>3<br>0 | 46<br>34<br>22 | < | < | ENTSO-E assessment |
| B1_RES Annual Socio-Economic Welfare increase resulting from RES integration | max<br>average<br>min | 11<br>8<br>7 | 14<br>10<br>8 | < | < | ENTSO-E assessment |

## Reduction of CO2 and GHG emissions

B4 Non-CO2 emissions (kg/year)

| | | | | | | |
|---|---|---|---|---|---|---|
| B4a Nitrogen oxides | average | 30874 | 3504 | n/a | n/a | ENTSO-E assessment |
| B4b Ammonia | average | 3564 | 364 | n/a | n/a | ENTSO-E assessment |
| B4c Sulfur dioxide | average | 1357 | 103 | n/a | n/a | ENTSO-E assessment |
| B4d Particular matter 5 | average | 2207 | 27412 | n/a | n/a | ENTSO-E assessment |
| B4e Particulate | | 1576 | 236 | n/a | n/a | ENTSO-E |

| | | | | | | |
|---|---|---|---|---|---|---|
| matter 10 | | average | | | | assessment |
| B4f Non-methane volatile organic compounds | | average | 808 | 27169 | n/a | n/a | ENTSO-E assessment |
| B2a Annual CO2 variation from market simulation (ktonnes / year) | | max<br>average<br>min | 9<br>-126<br>-260 | -790<br>-1207<br>-1661 | > | > | 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 | 4<br>10<br>21 | 38<br>87<br>194 | <<br><<br << | <<br><<br << | ENTSO-E assessment |
| B2b Annual CO2 variation due to network losses (ktonnes / year) | | average | 66 | 159 | 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 | -2<br>-5<br>-11 | -5<br>-11<br>-25 | 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 | 237<br>176<br>148 | 369<br>272<br>219 | < | < | 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 | 108 | 242 | n/a | n/a | ENTSO-E assessment |
| B5_€ Variation of network losses monetised (M€ / year) | average | 4 | 10 | n/a | n/a | ENTSO-E assessment |

## Security of supply

| | | | | | | |
|---|---|---|---|---|---|---|
| B6 Annual reduction in Energy Not Served (MWh / year) | max<br>average<br>min | | N/A | 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 | N/A | > | n/a | ENTSO-E assessment |

| **B10 Reduction of Necessary Reserve for Redispatch Power Plants** | **NT2025** | **NT2030** | |
|---|---|---|---|
| In Meuro/year | -1.2 | -3.5 | This indicator was submitted by the promoter(s). Based on the information provided, ENTSO-E has not been able to confirm the consistency of the proposed indicator with the CBA Guideline 3.0.<br>About the computation of this indicator by the project promoter(s) |
| In MW | | | |

This indicator was computed based on NT2025 and NT2030, in a study performed by TYNDP 2020 in 2020. The promoter(s) stated that the submitted value was computed in accordance with the CBA Guideline and explained it as follows:

• *Market simulation tools: Only one markets simulation per project and scenario (APG-Tool for P1052)*• *Scenarios: NT2025 and NT2030; Full compliance with the TYNDP 2020 Scenarios* • *Climate year: 2007*• *Number of points in time: full year (8736 hours)*• *Model perimeter: AT only, cross border flows based on full CE model*• *Load flow calculation type: AC ; No Time Coupling constrains* • *No Multiple TOOT/PINT* • *Consider Branches: only 380-kV and 220-kV Elements*• *No deviation from the guidelines due to special national regulatory conditions*

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

## 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 | 12 | 13 | ENTSO-E assessment |
| B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction | average | 9 | 14 | ENTSO-E assessment |
| B1_RES Annual Socio-Economic Welfare increase resulting from RES integration | average | 3 | 3 | ENTSO-E assessment |
| **Reduction of CO2 and GHG emissions** | | | | |
| B2a Annual CO2 variation from market simulation (ktonnes / year) | average | -163 | -398 | 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 | 1<br>8<br>22 | 10<br>26<br>61 | ENTSO-E assessment |
| **Integration of renewable energy sources** | | | | |
| | | | | |

| | | | | |
|---|---|---|---|---|
| B3 Annual avoided curtailment (RES integration) (GWh / year) | average | 50 | 71 | ENTSO-E assessment |
| B3a Connected RES (MW) | - | | | ENTSO-E assessment |

## Non scenario-dependent indicator(s)

| | 2020 | | | |
|---|---|---|---|---|
| B9 Avoidance of the Renewal/ Replacement Costs of Infrastructure (Meuro) | 186 | | | This indicator was submitted by the promoter(s). ENTSO-E confirms the consistency of the proposed indicator with the CBA Guideline 3.0. About the computation of this indicator by the project promoter(s) |

This indicator was computed in a study performed by APG - Austrian Power Grid in 2020. The promoter(s) stated that the submitted value was computed in accordance with the CBA Guideline and explained it as follows:

*I hereby state that the study performed to provide the project level input for TYNDP 2020 is compliant with the draft 3rd CBA Guideline.*
The promoter(s) certified that the values submitted and assessed in the study relate to countries located within the ENTSO-E perimeter only.

## 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 | 6 | ENTSO-E assessment |
| B1_CO2 Annual Socio-Economic Welfare increase resulting from CO2 emissions reduction | average | 4 | ENTSO-E assessment |
| B1_RES Annual Socio-Economic Welfare | average | 2 | ENTSO-E assessment |

| | | |
|---|---|---|
| increase resulting from RES integration | | |

### Reduction of CO2 and GHG emissions

| | | | |
|---|---|---|---|
| B2a Annual CO2 variation from market simulation (ktonnes / year) | average | -144 | 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 | 5<br>10<br>23 | ENTSO-E assessment |

### Integration of renewable energy sources

| | | | |
|---|---|---|---|
| B3 Annual avoided curtailment (RES integration) (GWh / year) | average | 42 | 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 |
|---|---|---|---|
| Lienz (AT) - Obersielach (AT) | Planned But Not Yet Permitting | 4 | |

Note based on CBA Guideline 3.0: Given that the actual route of the project might not be defined due to the low degree of maturity of its investment(s), an environmental assessment is not yet available.

### Residual social impact

| Investment | Investment status | Distance (km) | Type of sensitivity |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Lienz (AT) - Obersielach (AT) | Planned But Not Yet Permitting | 81 | |

Note based on CBA Guideline 3.0: Given that the actual route of the project might not be defined yet because of the low degree of maturity of its investment(s), a residual social impact assessment is not yet available.

## Project Costs

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

| | CAPEX (Meuro) | Uncertainty range (%) | OPEX |
|---|---|---|---|
| 1713. Lienz (AT) - Obersielach (AT) | 175 | 10 | 1.4 |
| Total | 175 | | 1.4 |

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

1713 Uncertainty regarding extra costs due to safety, environmental or legal requirements imposed during permit grating process.