

European Power System 2040

Completing the map Summary

The TYNDP package is delivering the masterplan for an electrically interconnected Europe and its citizens.

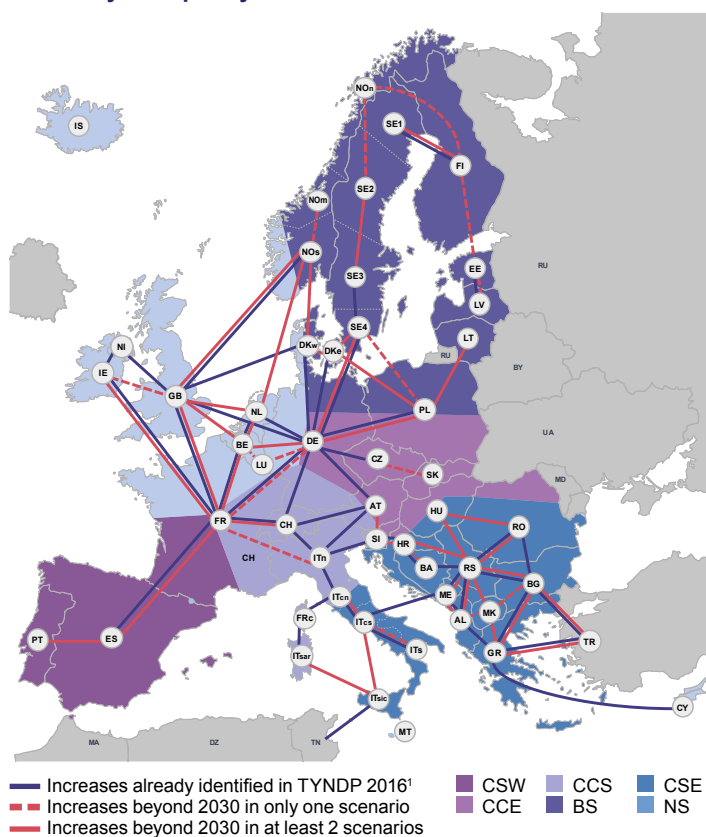
This is done by exposing the challenges for the EU energy transition and by providing next steps. An efficient transition requires efficient markets and efficient markets require sufficient infrastructure which will create value.

While the final TYNDP report will identify the most important projects for Europe, the System Need Report shows future capacity needs for the three 2040 scenarios of the TYNDP 2018. It continues the evolution of the TYNDP and contains analyses of stability issues, SoS, CO₂ emissions, integration of renewables in the grid and integration of markets with each other – all done in several scenarios and climate years.

2040 Needs of System Development

The map below shows potential needs for additional capacity increases in 2040 – beyond the 2020 grid.

Summary of capacity increases from 2020 to 2040



More information can be found in the European System Need Report 2018

- https://www.entsoe.eu/Documents/TYNDP%20documents/TYNDP2018/energy_power_system_2040.pdf in the Scenario Report
- https://www.entsoe.eu/Documents/TYNDP%20documents/TYNDP2018/scenario_report.pdf

and in the Regional Investment Plans 2017 of the ENTSO-E regional groups

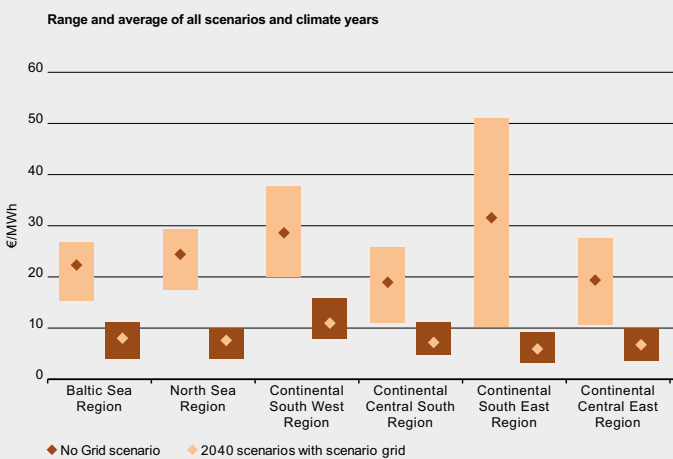
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- https://www.entsoe.eu/Documents/TYNDP%20documents/TYNDP2018/rgip_NS.pdf

¹ Reference capacities of TYNDP 2016 for 2030 which for some borders had been adjusted for the TYNDP 2018 purpose. Projects commissioned in 2020 are not included as increases.

The chart below shows the average marginal costs of electricity production per regional group as summary for all three 2040 scenarios and with the scenario grids implemented (**2040 scenarios with scenario grid**). The chart also shows the values if the capacity increases were not implemented (**No Grid scenario**). While some of the needs for capacity increases shown to the left are needed for reasons like increases in security of supply and integration of renewables, many of them also integrate the European electricity markets which can be seen in reduced average marginal cost differences of electricity production.

All 2040 Scenarios

European – Average hourly differences of marginal costs



Benefits

Increasing capacities at the borders, as shown on the map to the left, would have a significant impact on the ENTSO-E electrical system and society as a whole.



3 to 14 €/MWh
reduction in marginal costs of electricity generation



58 to 156 TWh
less curtailed renewable energy



37 to 59 Mton
reduction in CO₂



24 to 471 GWh
reduction in Energy Not Served