What is NOT in the Technical Report?

- No recommendation nor conclusion on the bidding zone configuration change (≠ a bidding zone review).
- Transparent & factual information on congestions in the whole European grid.
- Data from 2018 to 2020 on congestions & unscheduled flows and on costs of congestion.
- Evolution of congestions in the next 10 years.

What is IN it?

- The Bidding Zone Configuration Technical Report is part of regular reporting (every 3 years) on the bidding zone configuration which ENTSO-E is mandated to deliver by EU legislation.
- Transparent & factual information on congestions in the whole European grid.
- Data from 2018 to 2020 on congestions & unscheduled flows and on costs of congestion.
- Evolution of congestions in the next 10 years.

What is NEW?

- It includes the CEP’s 70% min capacity assessment.
- To facilitate the visualization, congestions below 0,5% are not shown in the main body of the report.
Transparent information on congestions in the European grid

3 timeframes

Before Day-ahead

Day-ahead

Real-time

3 years

Explanations

2018

2019

2020

Explanations from technical experts on congestions

Future vision

Looking at possible evolution of congestions up to 10 years ahead (2030)
Capacity calculation for the purpose of day-ahead allocation
Maps presented with frequency threshold of 0.5%
Day-ahead (D-1) timeframe
Maps presented with frequency threshold of 0.5%
Close-to-real-time (1h before real time)

Maps presented with frequency threshold of 0.5%
Close-to-real-time (ICS): 2018

Map presented with frequency threshold of 0.5%
Power flows not resulting from capacity allocation

Loopflows and unscheduled flows: average PTDF flow indicator (MW)

- Commercial transactions are physically realised by power flows distributed in the grid as per the law of physics. Those power flows also include loop-flows and unscheduled flows which cannot be ignored.
- Values are slowly decreasing over the reported years.
- High values can be observed for borders in Central Europe.
- In the context of CEP70, Elia and TenneT NL obtained a derogation for excessive loop-flows. The methodology for its calculation is described in the respective derogations granted to Belgium and the Netherlands, and differs from the methodology applied in this report.
- The key difference being the usage of CWE FB DA CC parameters and thus D2CF data instead of DACF data.
Power flows not resulting from capacity allocation

Loopflows and unscheduled flows

• Three years comparison shows different trend for each border.
• Values are slowly decreasing over the reported years.
• High values can be observed for borders in Central Europe: the highest values of the loop flows can still be found on the French-German border, where the geographical position and strong exporting character of these countries tends to increase the indicator.
Very high congestion revenues were received in France, Sweden and Norway, then Germany, Denmark and Finland.

Congestion income was relatively stable for most countries but increased substantially in the Nordics in 2020.

Congestion income for Great Britain is not always reported.
• Detailed representation of total financial firmness costs by border for the respective years only shows borders which have applied the financial firmness.

• Borders with zero values are not included.

• It is observed that the highest costs for financial firmness appeared on the border France-Great Britain followed by France-Italy.

• High costs are observed on the border Netherlands-Great Britain for the year 2020.
Transparency on costs and volumes related to congestions: physical firmness costs and volumes

*Since PSE applies ISP, cost and volume reported by PSE cover the whole ISP, i.e. not only congestion management, and thus reported cost and volume should be deemed to be strongly overestimated.

**Redispatch and grid reserves are illustrated in a summarised form in this graph to prevent unintended market repercussions. Detailed data were provided to the regulatory authorities.

- The values in the category "other" for the Netherlands are related to preventive restriction agreements.
- The values in the category "other" for Hungary represent costs related to distribution system bottlenecks related to ensuring special maintenance situations.
- The values in the category "other" for Spain represent costs related to distribution system bottlenecks related to ensuring the distribution network security and planned or unplanned outages.
Transparency on costs & volumes related to congestions: physical firmness costs & volumes

Costs of measures applied (kEUR):
- The graph shows countertrade (CT), internal redispatch (internal RD), cross-border redispatch (XB RD), internal grid reserves (GRI) and cross-border grid reserves (GR XB) for the years 2018, 2019 and 2020. Costs have been analysed in conjunction with volumes.
- Data on physical firmness costs is not provided for Switzerland.
- Highest costs are observed in Germany, followed by Austria and Poland.

Volumes of measures applied (GWh):
- The graph shows measures of countertrade (CT up, down), internal redispatch (internal RD up, down) cross-border redispatch (XB RD up, down), internal grid reserve (GRI up, down) and cross-border grid reserve (XB GR up, down). Volumes represent the physics of the system; economic and/or political factors such as prices or regulated components are not included in this measure.
- Highest volumes are reported in Poland, Germany and Denmark.

Cost of other measures applied (kEUR):
- The graph shows the countries which have reported costs for other measures such as renewable curtailment (RC), and other costs related to congestion management. The costs related to renewable curtailment are difficult to compare amongst countries, as they result from different compensation rules, which are subject to political decisions.
- The highest value is observed in Germany, followed by Spain and Netherlands.

Volumes of other measures applied (GWh):
- The graph shows the countries which have reported evolution of volumes of other measures such as renewable curtailment (RC) and other measures of congestion management.
- Renewable curtailment is highly related to installed RES production capacities in the respective countries.
Implementation of the CEP’s 70 % minimum capacity to be available for cross-zonal trade

TSO’s performance in regard to CEP70 provisions from 2020

### Austria
- **Type**: ATTS
- **Percentage of capacity available**: 100 %
- **Compliance status**: Compliant
- **Note**: Implementation of the CEP’s 70 % minimum capacity to be available for cross-zonal trade

### France
- **Type**: ATC
- **Percentage of capacity available**: 100 %
- **Compliance status**: Compliant

### Germany
- **Type**: German Transmission Grid Code (DE-VER)
- **Percentage of capacity available**: 100 %
- **Compliance status**: Compliant
- **Note**: Implementation of the CEP’s 70 % minimum capacity to be available for cross-zonal trade

### Italy
- **Type**: Terna
- **Percentage of capacity available**: 100 %
- **Compliance status**: Compliant

### Luxembourg
- **Type**: LuxNet
- **Percentage of capacity available**: N/A
- **Compliance status**: N/A

### Norway
- **Type**: Statnett
- **Percentage of capacity available**: 100 %
- **Compliance status**: Compliant

### Poland
- **Type**: PGE
- **Percentage of capacity available**: 100 %
- **Compliance status**: Compliant

### The Netherlands
- **Type**: Ten Network
- **Percentage of capacity available**: 100 %
- **Compliance status**: Compliant

### Ukraine
- **Type**: Ukrenergo
- **Percentage of capacity available**: 100 %
- **Compliance status**: Compliant

### Czech Republic
- **Type**: Czech Transmission Grid Code (CZ-VER)
- **Percentage of capacity available**: 100 %
- **Compliance status**: Compliant

### Denmark
- **Type**: Det Transmissions
- **Percentage of capacity available**: 100 %
- **Compliance status**: Compliant

### Estonia
- **Type**: Elera
- **Percentage of capacity available**: 100 %
- **Compliance status**: Compliant

### Finland
- **Type**: Fortum
- **Percentage of capacity available**: 100 %
- **Compliance status**: Compliant

### Greece
- **Type**: DEPA
- **Percentage of capacity available**: 100 %
- **Compliance status**: Compliant

### Hungary
- **Type**: MAV
- **Percentage of capacity available**: 100 %
- **Compliance status**: Compliant

### Ireland
- **Type**: Eirgrid
- **Percentage of capacity available**: 100 %
- **Compliance status**: Compliant

### Latvia
- **Type**: ELE
- **Percentage of capacity available**: N/A
- **Compliance status**: N/A

### Lithuania
- **Type**: Jaakelis
- **Percentage of capacity available**: 100 %
- **Compliance status**: Compliant

### Portugal
- **Type**: EDP
- **Percentage of capacity available**: 100 %
- **Compliance status**: Compliant

### Romania
- **Type**: Transferelectric
- **Percentage of capacity available**: 100 %
- **Compliance status**: Compliant

### Spain
- **Type**: CEPSA
- **Percentage of capacity available**: 100 %
- **Compliance status**: Compliant

### Sweden
- **Type**: Statkraft
- **Percentage of capacity available**: 100 %
- **Compliance status**: Compliant

### United Kingdom
- **Type**: National Grid
- **Percentage of capacity available**: 100 %
- **Compliance status**: Compliant

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### Notes

1. **The vast majority of TSOs acted in accordance with the CEP70 rules 100 % of the time**, considering action plans and/or derogations.

2. **Even when the minimum target was not reached, very often the TSO still considered itself compliant, as Art. 16 of EU Electricity Regulation allows – as a measure of last resort – the reduction of the offered cross-zonal capacity below the minimum targets, if the TSOs or RCCs, respectively, can justify that their application would endanger system security.**

1. Art. 16 of EU Electricity Regulation allows – as a measure of last resort – the reduction of the offered cross-zonal capacity below the minimum targets, if TSOs or RCCs, respectively, can justify that their application would endanger system security.

2. The number differs from the one in the ENTSO-E Market Report 2021 published earlier, which contains a wrong number (99.31 %). The vast majority of TSOs acted in accordance with the CEP70 rules 100 % of the time, considering action plans and/or derogations.
### Present congestions and their future evolutions

- In D-2 timeframe, reported congestions are generally on BZ borders or in their direct vicinity. Relatively few grid elements show congestions, for relative high frequency.
- In D-1 and CTRT timeframe reported congestions are either on tie lines or internal lines. Relatively high amount of grid elements show congestions, (most of them) for relative low frequency compared to D-2.

### Power flows not resulting from capacity allocation

- Values are slowly decreasing over the reported years.
- High values can be observed for borders in Central Europe.

### Congestion income

- Highest congestion income for France, Sweden and Norway, then Germany, Denmark and Finland.
- Congestion income was relatively stable for most countries but increased substantially in the Nordics in 2020.
- Congestion income for Great Britain is not always reported.

### Financial firmness costs

- Highest costs for financial firmness appeared on the border France-Great Britain followed by France-Italy.
- High costs are observed on the border Netherlands-Great Britain for the year 2020.
- Lower magnitude compared to physical firmness.
Main findings of the Technical Report

Physical firmness costs

- Data on physical firmness costs is not provided for Switzerland.
- Highest costs of measures applied for countertrade, internal redispatch, and cross-border redispatch are reported in Germany, followed by Austria and Poland.
- Highest costs of other measures applied (renewable curtailment, congestion management measures in distribution networks, grid reserves internal or cross-border and other costs for congestion management): Germany, Spain and Netherlands.

Physical firmness volumes

- Highest volumes measures applied for countertrade, internal redispatch, and cross-border redispatch are reported in Poland, Germany and Denmark.
- Highest volumes of other measures applied (renewable curtailment, congestion management measures in distribution networks, grid reserves internal or cross-border and other costs for congestion management) are reported in Germany, Spain and Italy.

CEP70% minimum capacity to be available for cross-zonal trade

- Majority of TSOs are acting in accordance to the CEP70 rule considering action plans and/or derogation.