ACER-ECRB Workshop:
70% Minimum Capacity
Regulation 2019/943
• Entered into force 4 July 2019
• Provisions applicable from 1 January 2020
• Distinguishes between
  • **Coordinated net transfer capacity (CNTC)** cross-zonal capacity calculation (Article 16(8)(a)), and;
  • **Flow-based** cross-zonal capacity calculation (Article 16(8)(b))
• Requires that at least 70% are offered
  • Maximisation principle still applies → 70% are not a ceiling – but a floor!
• Up to 30% can be used for reliability margins, loop flows and internal flows.
  • These flow types are not defined further.
ACER Recommendation 01/2019
ACER Recommendation No 01/2019 – Basic Principles

Describes monitoring of capacity made available for cross-zonal trade. $F_{\text{max}}$ serves as reference.

- Issued on 8 August 2019
- Regardless of whether flow-based or CNTC cross-zonal capacity calculation, monitoring should focus on critical network elements (CNEs) under contingency (CNECs) used in capacity calculation
  - CNECs hold information on operational security limits ($F_{\text{max}}$), which serve as the reference for 70%
- Motivation: CACM GL requires both flow-based and CNTC to be based on CNECs (Article 29)
- Focuses on data available once capacity calculation methodologies (CCMs) pursuant to CACM GL are implemented
  - Core Day-Ahead and Intraday CCM serves as a role model
- Not addressed:
  - Methodology for monitoring capacity made available before CCMs are implemented and data is available (e.g. bilateral NTC calculation not based on CNECs)
  - Allocation constraints (e.g. ramping constraints on HVDC interconnectors)
The aim is to determine the "margin available for cross-zonal trade" (MACZT).

MACZT is made up of two components:
- "margin from coordinated capacity calculation" (MCCC), and;
- "margin from non-coordinated capacity calculation" (MNCC)

"Coordination areas" are sets of bidding zone borders, for which cross-zonal capacity calculation is performed in a coordinated manner (such as CWE, Italy North, or bilateral NTC).

MCCC and MNCC are calculated for:
- every CNEC, and;
- every market time unit (MTU);
- in all coordination areas.

\[ \text{MACZT} (CC \ MTU) = \text{MCCC} (CC \ MTU) + \text{MNCC} (CC \ MTU) \geq 70\% \ F_{\text{max}} (CC \ MTU) \]
ACER Recommendation No 01/2019 – Illustration

MACZT is comprised of two parts: MCCC and MNCC.

- $MACZT(CC\ MTU) = MCCC(CC\ MTU) + MNCC(CC\ MTU) \geq 70\%\ F_{\text{max}}(CC\ MTU)$

F\text{\ max} = 100\%

MACZT $\geq 70\%$

Not MACZT $\leq 30\%$
ACER Recommendation No 01/2019 – MCCC

Computation per CNEC and Market Time Unit (MTU). Already allocated capacity considered.

Flow-based (day-ahead)

\[ MCCC_{FB}(CC \ MTU) = RAM_{DA}(CC \ MTU) + F_{AAC,DA}(CC \ MTU) \]

\[ = RAM_{DA}(CC \ MTU) + \sum_{b \in \text{coordination area}} PTDF_{zz,b}(CC \ MTU) \times AAC_{DA,b}(CC \ MTU) \]

(C)NTC

\[ MCCC_{NTC}(CC \ MTU) = \sum_{b \in \text{coordination area}} pPTDF_{zz,b}(CC \ MTU) \times NTC_{b}(CC \ MTU) \]
ACER Recommendation No 01/2019 – MNCC

Computation per CNEC and Market Time Unit (MTU). Forecast exchanges not readily available.

Forecast net positions and exchanges on HVDC interconnectors:

$$\text{MNCC} = \sum_{\text{HVDC interconnectors}} \sum_{b \in \text{Europe}} \text{PTDF}_{z2h,bz} \cdot \text{GMNP}_{bz,\text{ext}}$$

Zone-to-zone PTDF:

$$\sum_{b \notin \text{coordination area}} \text{PTDF}_{z2z,b,i} \cdot \text{CGME}_{b}$$

Forecast exchanges:

$$\sum_{b \notin \text{coordination area}} \text{PTDF}_{z2z,b,i} \cdot \text{CGME}_{b}$$
State of play:
- Few coordination areas with more one bidding zone border:
  - CWE
  - Italy North
  - (Nordic)
- Bilateral NTC calculation dominant
- Coordination areas are going to correspond to capacity calculation regions, once capacity calculation methodologies are implemented
Third Countries
Consideration of 3rd Countries
Basic principles laid down in letter from EC.

- EC letter dated 16 July 2019
  - “… The Commission therefore considers that consideration of third country flows in capacity calculation should be possible on the condition that an agreement has been concluded by all TSOs of a CCR with the TSO of a third country. …”
  - “The final agreement should be fully in line with EU capacity calculation principles and rules and cover at least the following:
    1) consideration of internal third country constraints for intra-EU capacity calculation,
    2) consideration of EU internal constraints for capacity calculation on the border with third country, and
    3) cost-sharing of remedial actions”
- If such an agreement is struck, flows from/to 3rd countries can be taken into account when assessing 70%
- Discussions on ‘technical agreement’ with Switzerland ongoing
Example
Pleinting - St. Peter 258  
Cross-zonal CNE on DE-AT bidding zone border. Observe: CNE is directed.

- **CNE:**
  - Pleinting - St. Peter 258

- **Associated contingencies:**
  - (BASECASE)
    - Simbach - St. Peter
    - Pirach - St. Peter
    - Schwandorf – Plattling
    - Duernrohr – Kronsdorf
    - Etzersdorf – Kronsdorf
    - Tauern PST
Pleinting - St. Peter 258

Assigned to coordination area CWE. Occasionally limiting exchanges in CWE in day-ahead market coupling.

- Comprised of bidding zone borders:
  - AT-DE
  - BE-FR
  - BE-NL
  - DE-FR
  - DE-NL

- Only coordination area with operating flow-based capacity calculation and allocation
### MCCC for CC MTU

\[
\frac{MCCC_{FB}^{CC}}{MTU} = RAM_{DA}^{CC} (MTU) + \sum_{b \in \text{coordination area}} PTDF_{zz,b}^{CC} (MTU) * AAC_{DA,b}^{CC} (MTU)
\]

<table>
<thead>
<tr>
<th>Contingency</th>
<th>(F_{max})</th>
<th>RAM</th>
<th>AT-DE</th>
<th>DE-AT</th>
<th>BE-NL</th>
<th>NL-BE</th>
<th>DE-NL</th>
<th>NL-DE</th>
<th>BE-FR</th>
<th>FR-BE</th>
<th>FR-DE</th>
<th>DE-FR</th>
<th>MCCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASECASE</td>
<td>656</td>
<td>459</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.70</td>
</tr>
<tr>
<td>Simbach - St. Peter 233/230</td>
<td>656</td>
<td>459</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.70</td>
</tr>
<tr>
<td>Simbach - St. Peter 234/230</td>
<td>656</td>
<td>459</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.70</td>
</tr>
<tr>
<td>Pirach - St. Peter 256</td>
<td>656</td>
<td>456</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.70</td>
</tr>
<tr>
<td>Schwandorf - Plattling 465</td>
<td>656</td>
<td>448</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.68</td>
</tr>
<tr>
<td>Duernrohr - Kronsdorf 433</td>
<td>656</td>
<td>454</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.69</td>
</tr>
<tr>
<td>Etzersdorf - Kronsdorf 434A</td>
<td>656</td>
<td>463</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.71</td>
</tr>
<tr>
<td>Tauern PST (TAPST)</td>
<td>656</td>
<td>310</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.47</td>
</tr>
</tbody>
</table>

RAM ~ 310 – 463 MW

Long-term nominations = 0

Example data for 25 September 2019 MTU 9. Computation of MCCC normalised by \(F_{max}\).
### MNCC (CC MTU)

\[
\text{MNCC (CC MTU)} = \sum_{b \notin \text{coordination area}} \text{PTDF}_{z2z,b} (\text{CC MTU}) \ast \text{CGME}_{b} (\text{CC MTU})
\]

**Contingency** | \( F_{\text{max}} \) | \( \text{RAM} \) | AT-CZ | SI-SK | AT-CZ | SI-SK | MNCC
--- | --- | --- | --- | --- | --- | --- | ---
BASECASE | 656 | 459 | PTDF | PTDF | 500 | 0 | 0.50
Simbach - St. Peter 233/230 | 656 | 459 | PTDF | PTDF | 500 | 0 | 0.31
Simbach - St. Peter 234/230 | 656 | 459 | PTDF | PTDF | 500 | 0 | 0.31
Pirach - St. Peter 256 | 656 | 456 | PTDF | PTDF | 500 | 0 | 0.33
Schwandorf - Plattling 465 | 656 | 448 | PTDF | PTDF | 500 | 0 | 0.37
Duernrohr - Kronsdorf 433 | 656 | 454 | PTDF | PTDF | 500 | 0 | 0.07
Etzersdorf - Kronsdorf 434A | 656 | 463 | PTDF | PTDF | 500 | 0 | 0.25
Tauern PST (TAPST) | 656 | 310 | PTDF | PTDF | 500 | 0 | 0.34

*Day-Ahead NTCs (used as proxy)*

Example data for 25 September 2019 MTU 9. Computation of MNCC normalised by \( F_{\text{max}} \).
Contingency | $F_{\text{max}}$ | RAM | MCCC | MNCC | MACZT
--- | --- | --- | --- | --- | ---
BASECASE | 656 | 459 | 0.7 | 0.50 | 1.20
Simbach - St. Peter 233/230 | 656 | 459 | 0.7 | 0.31 | 1.01
Simbach - St. Peter 234/230 | 656 | 459 | 0.7 | 0.31 | 1.01
Pirach - St. Peter 256 | 656 | 456 | 0.7 | 0.33 | 1.03
Schwandorf - Plattling 465 | 656 | 448 | 0.68 | 0.37 | 1.05
Duernrohr - Kronsdorf 433 | 656 | 454 | 0.69 | 0.07 | 0.76
Etzersdorf - Kronsdorf 434A | 656 | 463 | 0.71 | 0.25 | 0.96
Tauern PST (TAPST) | 656 | 310 | 0.47 | 0.34 | 0.81

$\text{MACZT}(\text{CC MTU}) = M\text{CCC}(\text{CC MTU}) + M\text{NCC}(\text{CC MTU}) \geq 70\% \ F_{\text{max}}(\text{CC MTU})$
Aggregation

Aggregation over time on CNEC level ➔ CNE ➔ All CNECs of TSO/Member State/ coordination area

- TSO
- Member State/Country
- Coordination area
Challenges ahead

Data provision and quality to be improved. More applicable once CCMs and CGM is in place.

• Data provision
  • ENTSO-E Transparency Website and JAO do not provide all required data (e.g. forecast exchanges, z2z PTDFs for coordination areas other than CWE)

• Applicability
  • Several CCMs implemented before CACM GL and used today are not based on CNECs
  • ACER Recommendation based on data which is (partly) first available once CCMs are implemented
  • Forecasts and assumptions in capacity calculation first fully aligned among all TSOs when CGM is implemented

• Third Countries
  • Discussions on agreement with CH ongoing among EC and neighbouring Member States
  • When are you joining? You may already want to start hiring data analysts. 😊
REINHARD KAISINGER

+43 1 24724 513

reinhard.kaisinger@e-control.at

www.e-control.at
Energy for our future.

E-Control
Rudolfsplatz 13a, 1010 Wien
Tel.: +43 1 24 7 24-0
Fax: +43 1 247 24-900
E-Mail: office@e-control.at
www.e-control.at
Twitter: www.twitter.com/energiecontrol
Facebook: www.facebook.com/energie.control
C-CONTROL

Energy for our future.