| | |
|---|---|
| ***CORESO Engineers***<br>***North :*** SANTOS Eduardo<br>***South :*** MÜHLING Philipp | **Day Ahead report for**<br><br>**18 January 2018** |

**Security Levels:**

**CWE: Constraints detected, however manageable with topological actions. N-2 contingency list considered for Elia and RTE due to wind storm from 03:00 till 11:00.**

**CEE: Constraints detected requiring coordination between 50HertZ and CEPS.**

**CSE: Critical constraints found due to Sils - Soazza 380kV forced outage. Pentalateral reduction procedure of 2500MW between CH - IT needed.**

## Key overall conditions

| Load & Generation margin forecast | | | Main generating units connected to the grid in DACF | | | | | |
|---|---|---|---|---|---|---|---|---|
| **ELIA** | | | Elia | Doel | Pmax (MW) | 1000 | **1** | 1900 |
| | | | | | | 450 | 2 | |
| Peak load [MW] | 10600 | 18:00 | | Tihange | | 1000 | 2 | 2900 |
| | | | | | | 450 | 2 | |
| Generation Margin | Sufficient | | | Coo | | 230 | 3 | 1170 |
| | | | | | | 160 | 3 | |
| | | | 50HzT | Rostock | Pmax (MW) | 530 | 1 | 530 |
| | | | | Janschwalde | | 500 | 6 | 3000 |
| | | | | Boxberg | | 500 | 2 | 2800 |
| | | | | | | 900 | 2 | |
| | | | | Schw. Pumpe | | 800 | **1** | 800 |
| | | | | Lippendorf | | 920 | 2 | 1840 |
| **RTE** | | | RTE | Gravelines | Pmax (MW) | 900 | 6 | 5400 |
| Peak load [MW] | 75600 | 19:00 | | Chooz | | 1500 | 2 | 3000 |
| Generation Margin | Sufficient | | | Cattenom | | 1300 | 4 | 5200 |
| | | | | Fessenheim | | 900 | **1** | 900 |
| **NATIONAL GRID (UK time)** | | | | Penly | | 1300 | 2 | 2600 |
| Peak load [MW] | 48 700 | 17:00 | | Paluel | | 1300 | **3** | 3900 |
| Generation Margin | | | | Nogent s/ Seine | | 1300 | 2 | 2600 |
| | | | | Bugey | | 900 | 4 | 3600 |
| **TERNA** | | | | St Alban | | 1300 | 2 | 2600 |
| Peak load [MW] | 47450 | 18:30 | | Cruas | | 900 | **2** | 1800 |
| Generation Margin | Sufficient | | | Tricastin | | 900 | 4 | 3600 |

**Generation margin legend:**

Green: Sufficient margin available. No risk for need of inter-TSO solicitation due to margin issues.

Orange: Tight margin available. Low risk for need of inter-TSO solicitation due to margin issues.

Red: Insufficient margin available. High risk for need of inter-TSO solicitation due to margin issues.

**Comments:**

CWE / CEE

**Elia/RTE:** N-2 special contingency list applied in the studies due to wind storm forescasted from 03:00 till 11:00 with wind blows higher than 140km/h.

CSE

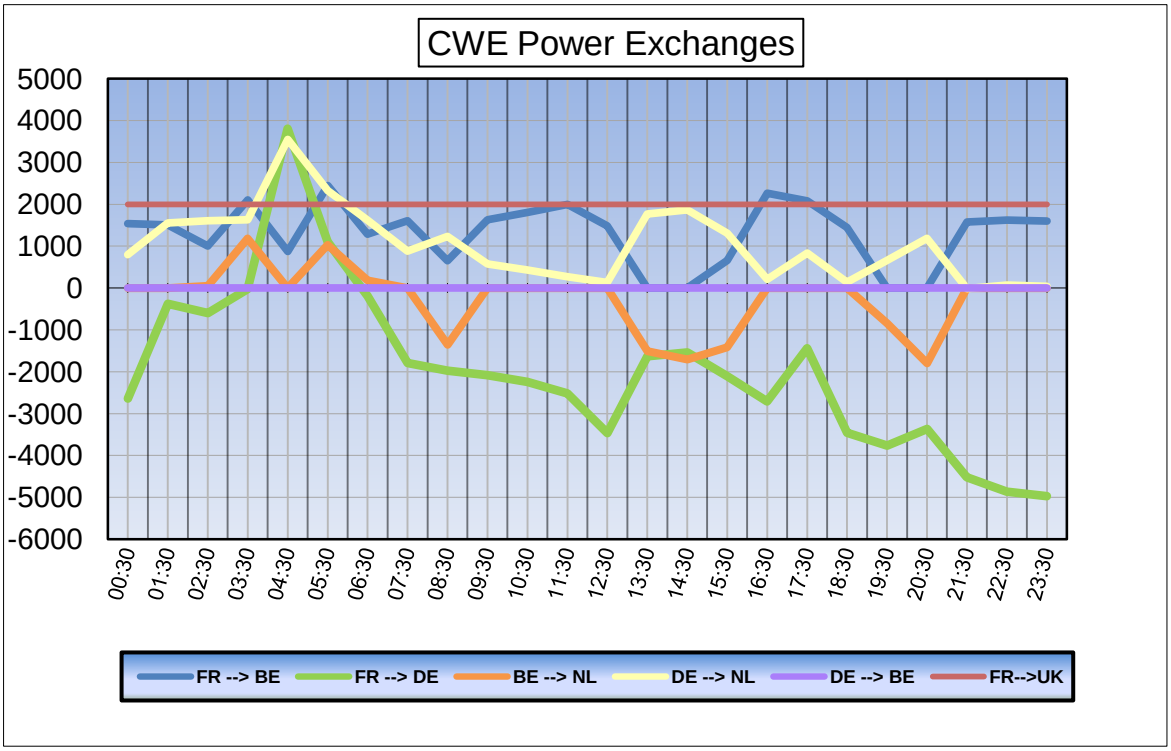
**SWG:** The line Sils - Soazza 380kV tripped at 16/01 and was considered in outage during all day, foreseen return date: 19/01. Additional today tripped the tie lines 220kV Serra - Pallanzerno - Morel and 220kV Airolo - Ponte - Fiesch.

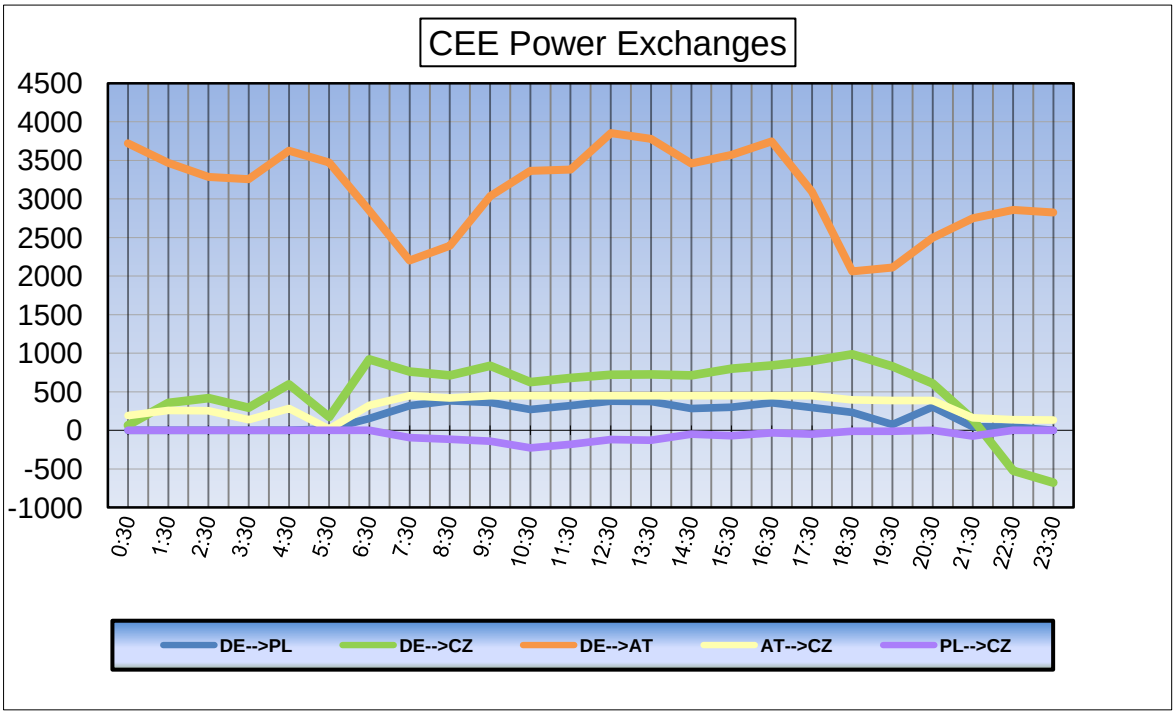
**Eles:** An increase of the target flow from 800MW to 1200MW is possible all hours of the day. That has been confirmed from APG.

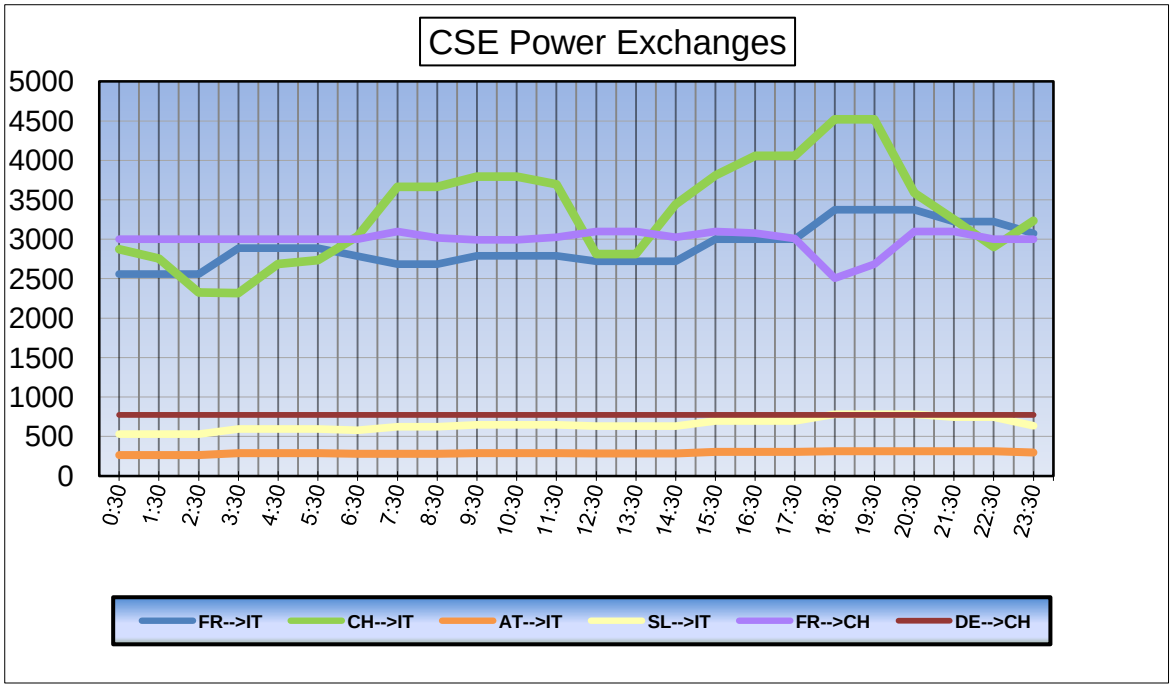
# Outages table

| OUTAGES | | | | | |
|---|---|---|---|---|---|
| Owner | Type of element | Line name | start | end | Comments |
| 50HzT | Hydro.Gen | MARKERSBACH _ Unit D 400 kV | 28/09/2017 | 27/04/2018 | 160 MW |
| 50HzT | Line | EULA _ Wolkramhausen 357 220 kV | 06/10/2017 | 16/03/2018 | |
| 50HzT | Line | GORRIES _ KRUMMEL 419 400 kV | 18/01/2018 | 18/01/2018 | |
| 50HzT | Line | HAGENWERDER _ SCHMÖLLN 553 400 kV | 18/01/2018 | 19/01/2018 | |
| 50HzT | Line | HAMBURG Nord _ BRUNSBUTTEL 951 400 kV | 14/01/2018 | 21/01/2018 | |
| 50HzT | Line | HAMBURG Nord _ HAMBURG Ost 961 400 kV | 15/01/2018 | 19/01/2018 | |
| 50HzT | Line | LUBMIN _ WIKINGER 281 220 kV | 26/09/2017 | 31/01/2018 | |
| 50HzT / CEPS | Line | HRADEC VYCHOD _ ROHRSDORF 445 400 kV | 18/01/2018 | 19/01/2018 | |
| 50HzT / PSE | Line | KRAJNIK _ VIERRADEN 507 225 kV | 22/06/2016 | 21/01/2018 | Long term outage |
| 50HzT / PSE | Line | KRAJNIK _ VIERRADEN 508 225 kV | 22/06/2017 | 21/01/2018 | Long term outage |
| AMP / TEN DE | Line | NEHDEN _ TWISTETAL W 400 kV | 08/01/2018 | 23/02/2018 | |
| AMPRION | Line | NEHDEN _ ARPE Sud 400 kV | 15/01/2018 | 02/02/2018 | |
| APG | Line | ST PETER _ Salzburg 455 220 kV | 15/01/2018 | 19/01/2018 | ALTERNATING WITH 456 |
| APG | Line | ST PETER _ Salzburg 456 220 kV | 15/01/2018 | 19/01/2018 | ALTERNATING WITH 455 |
| CEPS | Line | DASNY _ KOCIN 473 400 kV | 08/01/2018 | 26/01/2018 | |
| CEPS / SEPS | Line | NOSOVICE _ VARIN 404 400 kV | 15/01/2018 | 02/03/2018 | |
| CREOS | Line | BERTRANGE _ SCHIFFLANGE West 220 kV | 08/01/2018 | 02/03/2018 | |
| ELIA | Line | GEZELLE _ STEVIN 111 400 kV | 19/09/2017 | 02/03/2018 | |
| ELIA | Line | GEZELLE _ STEVIN 112 400 kV | 19/09/2017 | 02/03/2018 | |
| ELIA | Nuc.Gen | DOEL _ Unit 3 (1000MW) 400 kV | 23/09/2017 | 16/04/2018 | Forced outage |
| HOPS | Line | BRINJE _ KONJSKO 220 kV | 17/01/2018 | 27/01/2018 | |
| PSE | Line | DUNOWO _ SLUPSK 400 kV | 18/01/2018 | 21/01/2018 | |
| PSE | Line | POLANIEC _ TARNOW 400 kV | 15/01/2018 | 19/01/2018 | |
| PSE | Line | TUCZNAWA _ RZESZOW 400 kV | 15/01/2018 | 19/01/2018 | |
| RTE | Nuc.Gen | CRUAS _ Unit 2 (900MW) 400 kV | 02/12/2017 | 30/03/2018 | |
| RTE | Nuc.Gen | FESSENHEIM _ Unit 2 (900MW) 400 kV | 01/01/2017 | 15/03/2018 | |
| RTE | Nuc.Gen | PALUEL _ Unit 2 (1300MW) 400 kV | 01/08/2015 | 15/04/2018 | |
| S.GRID | Line | CHAMOSON _ MUHLEBERG "Sanetsch 2" 220 kV | 24/10/2017 | 30/03/2018 | |
| S.GRID | Line | LIMMERN _ TIERFEHD 1 400 kV | 28/01/2017 | 31/07/2018 | |
| S.GRID | Nuc.Gen | BEZNAU _ BEZNAU G11 220 kV | 13/03/2015 | 28/02/2018 | 182 MW |
| S.GRID | Nuc.Gen | BEZNAU _ BEZNAU G12 220 kV | 13/03/2015 | 28/02/2018 | 182 MW |
| TENNET DE | Line | BERGSHAUSEN _ GROHNDE 1 400 kV | 15/01/2018 | 19/01/2018 | |
| TENNET DE | Line | GROHNDE _ KLEIN ILSEDE 1 400 kV | 18/01/2018 | 26/02/2018 | |
| TENNET DE | Line | ISAR _ OTTENHOFEN 444 400 kV | 18/01/2018 | 19/01/2018 | |
| TENNET DE | Line | ISAR _ OTTENHOFEN 446 400 kV | 18/01/2018 | 19/01/2018 | |
| TENNET DE | Line | TWISTETAL _ BORKEN 3 400 kV | 16/05/2017 | 11/10/2018 | |
| TENNET DE | Line | WAHLE _ ALGERMISSEN 2 400 kV | 18/01/2018 | 26/01/2018 | |
| TENNET DE | Line | WAHLE _ KLEIN ILSEDE 3 380 kV | 18/01/2018 | 21/01/2018 | |
| TENNET NL | Line | BLEISWIJK _ KRIMPEN ZT 400 kV | 15/01/2018 | 19/01/2018 | Daily |
| TENNET NL | Line | HENGELO _ ZWOLLE WT 400 kV | 13/01/2018 | 19/01/2018 | permanent |
| TERNA | Line | PIAN CAMUNO _ S.FIORANO 358 400 kV | 09/01/2018 | 19/01/2018 | Forced outage |
| TransnetBW | Line | NEUROTT _ PHILIPPSBURG RT 400 kV | 15/01/2018 | 07/02/2018 | |

## Exchange program forecasts




CSE Power Exchanges
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0:30
1:30
2:30
3:30
4:30
5:30
6:30
7:30
8:30
9:30
10:30
11:30
12:30
13:30
14:30
15:30
16:30
17:30
18:30
19:30
20:30
21:30
22:30
23:30
FR-->IT
CH-->IT
AT-->IT
SL-->IT
FR-->CH
DE-->CH

## ELIA expected flows & PSTs tap position

| | | Node 1 | Node 2 | Order | 03:30 | 04:30 | 07:30 | 08:30 | 10:30 | 12:30 | 14:30 | 17:30 | 19:30 | 20:30 | 22:30 | 23:30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BE | FR | ACHENE | LONNY | 380.19 | -416 | -633 | -41 | 57 | -8 | 140 | 44 | -126 | 384 | 266 | 220 | 199 |
| BE | FR | AUBANGE | MONT ST MARTIN | 220.51 | -158 | -241 | -57 | 10 | -52 | -7 | -41 | -96 | 71 | 12 | 29 | 16 |
| BE | FR | AUBANGE | MOULAINE | 220.51 | -151 | -229 | -56 | 7 | -47 | -5 | -39 | -98 | 59 | 2 | 24 | 8 |
| BE | FR | AVELGEM | AVELIN | 380.80 | -741 | -1051 | -330 | -104 | -224 | 52 | -136 | -415 | 409 | 223 | 26 | 50 |
| BE | FR | AVELGEM | MASTAING | 380.79 | -406 | -550 | -309 | -222 | -278 | -116 | -196 | -348 | 27 | -38 | -106 | -106 |
| BE | FR | MONCEAU | CHOOZ | 220.48 | -175 | -210 | -164 | -162 | -177 | -127 | -147 | -191 | -102 | -124 | -126 | -137 |
| BE | NL | VAN EYCK 1 | MAASBRACHT | 380.27 | 28 | 183 | -306 | -418 | -355 | -377 | -344 | -337 | -466 | -505 | -463 | -464 |
| BE | NL | VAN EYCK 2 | MAASBRACHT | 380.28 | 525 | 802 | 257 | 46 | 186 | 5 | 84 | 250 | 41 | -170 | -102 | -82 |
| BE | NL | ZANDVLIET | BORSSELE | 380.29 | 14 | 134 | -544 | -823 | -752 | -813 | -749 | -672 | -843 | -931 | -670 | -669 |
| BE | NL | ZANDVLIET | GEERTRUIDENBERG | 380.30 | 413 | 678 | -34 | -216 | -59 | -141 | -113 | -26 | -314 | -398 | -331 | -294 |
| BE | LU | BELVAL | SCHIFFLANGE | 220.511 | 124 | 222 | -9 | -167 | -24 | -85 | -55 | -7 | -93 | -124 | -138 | -144 |

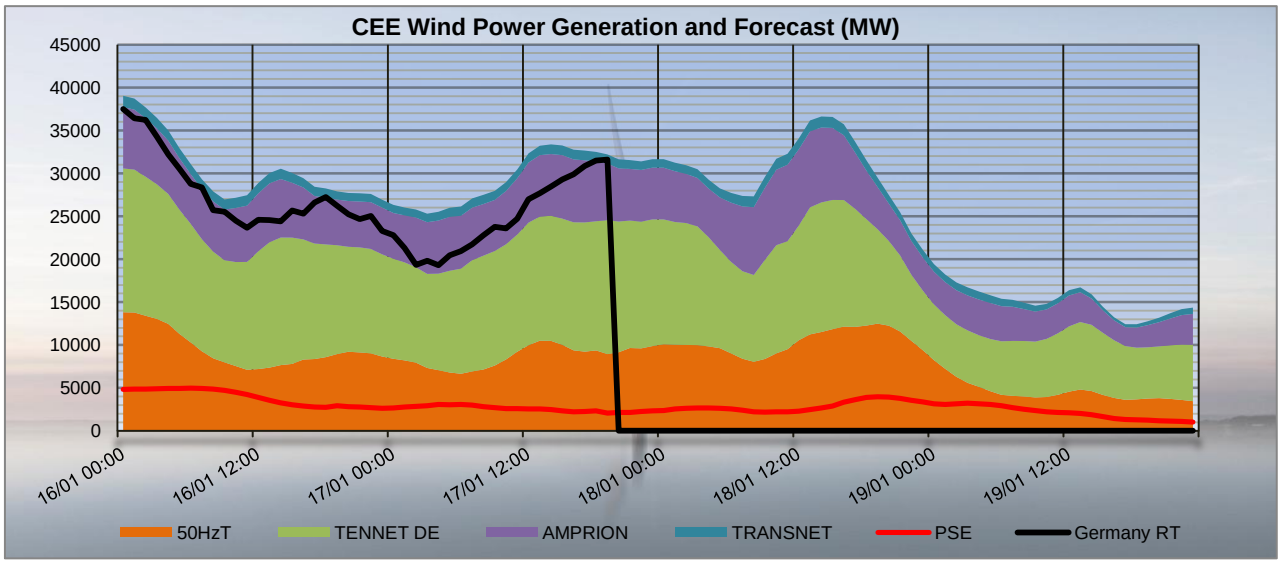
| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BE | FR | TOTAL | | -2047 | -2914 | -957 | -414 | -786 | -63 | -515 | -1274 | 848 | 341 | 67 | 30 |
| BE | NL | TOTAL | | 980 | 1797 | -627 | -1411 | -980 | -1326 | -1122 | -785 | -1582 | -2004 | -1566 | -1509 |
| BE | LU | TOTAL | | 124 | 222 | -9 | -167 | -24 | -85 | -55 | -7 | -93 | -124 | -138 | -144 |
| TOTAL BELGIAN IMPORT/EXPORT | | | | -943 | -895 | -1593 | -1992 | -1790 | -1474 | -1692 | -2066 | -827 | -1787 | -1637 | -1623 |

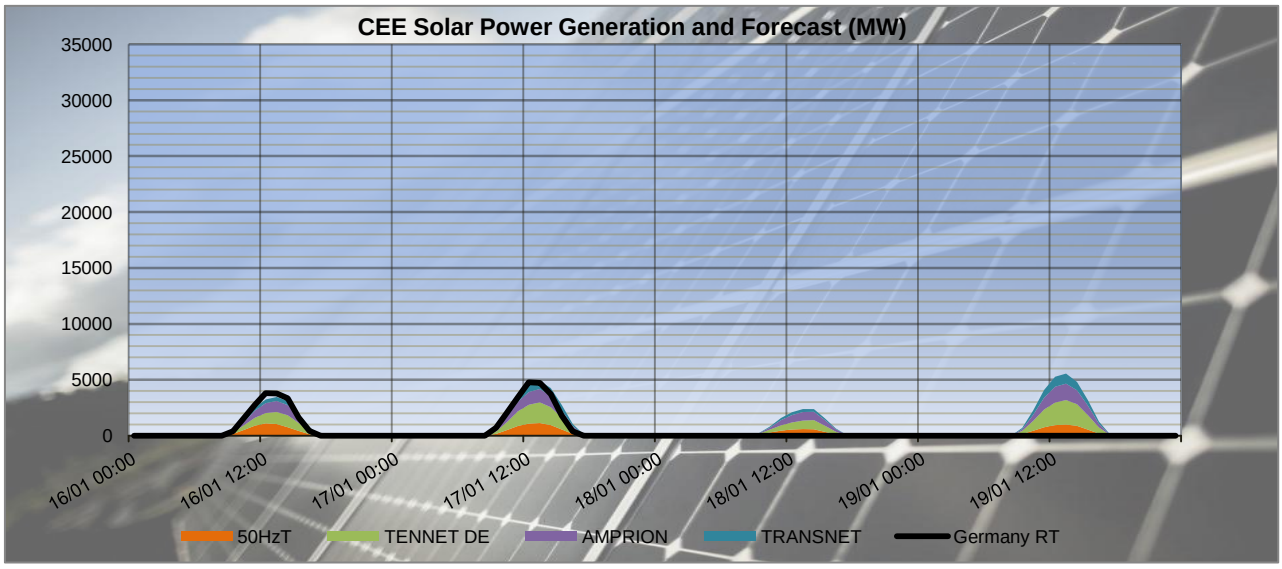
| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PST taps in DACF | **Zandvliet 1** | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| | **Zandvliet 2** | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| | **Van Eyck 1** | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| | **Van Eyck 2** | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| | **Average** | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CREOS PST in DACF | **Schifflange** | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 |

| Proposal for real time after D-1 studies | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Timestamps** | | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** | **19** | **20** | **21** | **22** | **23** | **24** |
| **PSTs** | | | | | | | | | | | | | | | | | | | | | | | | |
| **Zandvliet PST 1** | **[1;35]** | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| **Zandvliet PST 2** | **[1;35]** | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| **Van Eyck PST 1** | **[1;35]** | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| **Van Eyck PST 2** | **[1;35]** | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| **Schifflange PST 1** | **[1;35]** | 17 | 17 | 17 | 17 | 17 | 25 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 |

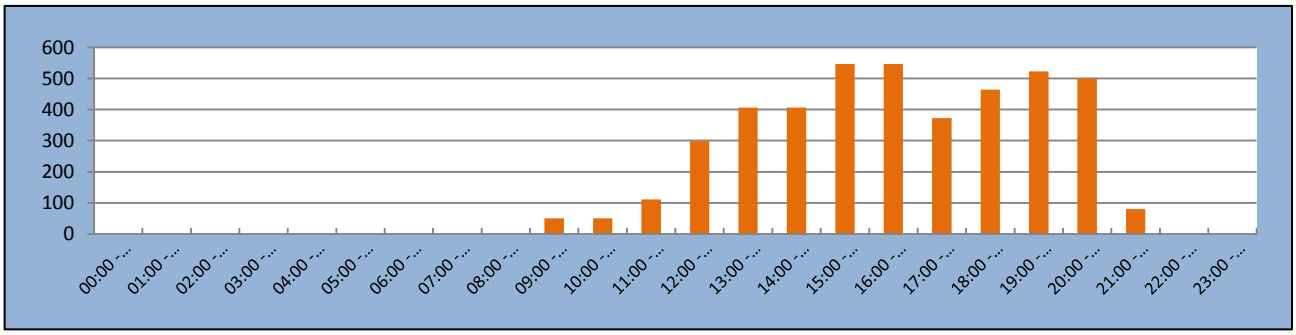
## CEE Renewable Power Generation & Forecast



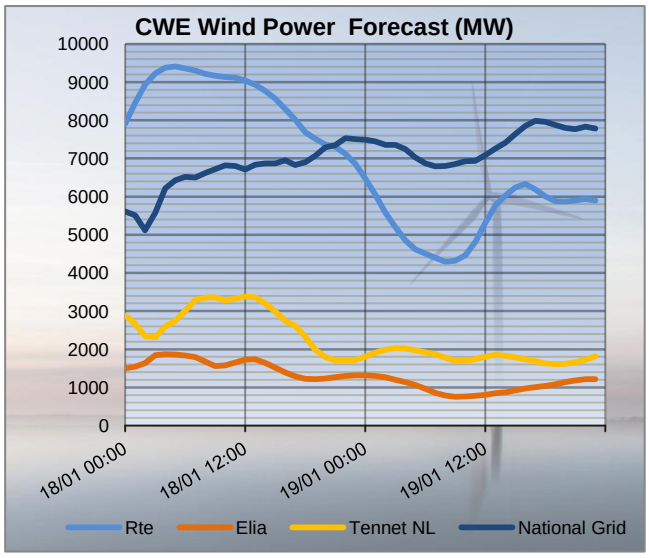



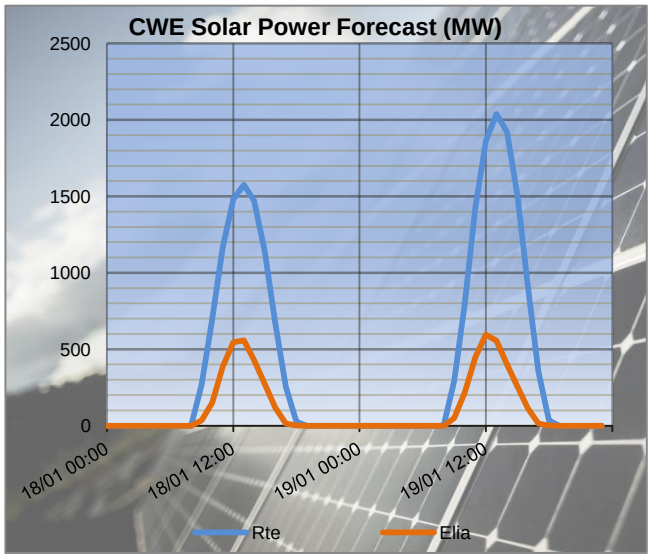

The charts above show the wind and solar generation forecasts for the TSOs in CEE (most significant) from D+1 until D-2 and the realised generation in Germany in real time. Source: Meteologica and 50HzT (RT)

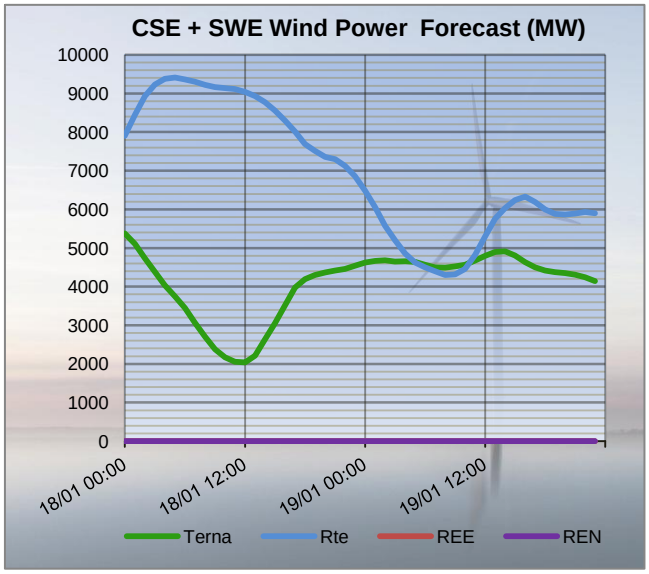
## 50HzT Preventive Redispatch

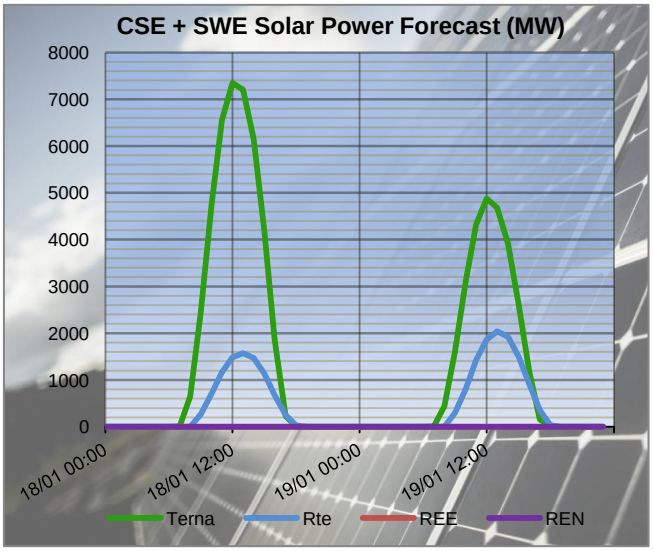


## CWE, CSE & SWE Renewable Power Forecast (D-1 and D-2)




The charts above show the latest wind and solar generation forecasts for D-1 and D-2 for all the European TSOs in CWE, CSE and SWE with a significant installed capacity. Source: Meteologica

## RTE flows on cross-border lines

With last provided tap position on Belgian PSTs:

| | | | | 03:30 | | | 07:30 | | | 10:30 | | | 12:30 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Node 1 | Node 2 | DACF | Merge | Delta | DACF | Merge | Delta | DACF | Merge | Delta | DACF | Merge | Delta |
| FR | BE | LONNY | ACHENE | 743 | 416 | **-327** | 352 | 41 | **-311** | 326 | 8 | **-318** | 147 | -140 | **-287** |
| FR | BE | MONT ST MARTIN | AUBANGE | 138 | 158 | 20 | 72 | 57 | -15 | 93 | 52 | -41 | 48 | 7 | -41 |
| FR | BE | MOULAINE | AUBANGE | 131 | 151 | 20 | 70 | 56 | -14 | 85 | 47 | -38 | 44 | 5 | -39 |
| FR | BE | AVELIN | AVELGEM | 961 | 741 | -220 | 485 | 330 | -155 | 370 | 224 | -146 | 132 | -52 | -184 |
| FR | BE | MASTAING | AVELGEM | 568 | 406 | -162 | 414 | 309 | -105 | 377 | 278 | -99 | 235 | 116 | -119 |
| FR | BE | CHOOZ | MONCEAU | 0 | 175 | 175 | 0 | 164 | 164 | 0 | 177 | 177 | 0 | 127 | 127 |
| FR | DE | MUHLBACH | EICHSTETTEN | 360 | 558 | 198 | 363 | 453 | 90 | 301 | 394 | 93 | 229 | 326 | 97 |
| FR | DE | VOGELGRUN | EICHSTETTEN | 10 | 73 | 63 | 10 | 70 | 60 | -12 | 64 | 76 | -52 | 52 | 104 |
| FR | DE | ST AVOLD | ENSDORF | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FR | DE | VIGY | ENSDORF 1 | 471 | 612 | 141 | 255 | 254 | -1 | 168 | 196 | 28 | -86 | -4 | 82 |
| FR | DE | VIGY | ENSDORF 2 | 521 | 691 | 170 | 237 | 252 | 15 | 143 | 193 | 50 | -133 | -27 | 106 |

| | | | | 17:30 | | | 19:30 | | | 23:30 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Node 1 | Node 2 | DACF | Merge | Delta | DACF | Merge | Delta | DACF | Merge | Delta |
| FR | BE | LONNY | ACHENE | 395 | 126 | **-269** | -169 | -384 | -215 | 27 | -199 | -226 |
| FR | BE | MONT ST MARTIN | AUBANGE | 94 | 96 | 2 | -53 | -71 | -18 | 22 | -16 | -38 |
| FR | BE | MOULAINE | AUBANGE | 96 | 98 | 2 | -41 | -59 | -18 | 27 | -8 | -35 |
| FR | BE | AVELIN | AVELGEM | 669 | 415 | **-254** | -249 | -409 | -160 | 28 | -50 | -78 |
| FR | BE | MASTAING | AVELGEM | 519 | 348 | -171 | 80 | -27 | -107 | 168 | 106 | -62 |
| FR | BE | CHOOZ | MONCEAU | 0 | 191 | 191 | 0 | 102 | 102 | 0 | 137 | 137 |
| FR | DE | MUHLBACH | EICHSTETTEN | 317 | 479 | 162 | -57 | 86 | 143 | 5 | 175 | 170 |
| FR | DE | VOGELGRUN | EICHSTETTEN | 26 | 91 | 65 | -58 | 17 | 75 | -67 | 33 | 100 |
| FR | DE | ST AVOLD | ENSDORF | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FR | DE | VIGY | ENSDORF 1 | 328 | 253 | -75 | -166 | -93 | 73 | -230 | -69 | 161 |
| FR | DE | VIGY | ENSDORF 2 | 306 | 254 | -52 | -290 | -187 | 103 | -317 | -128 | 189 |

| | | | | 03:30 | | | 07:30 | | | 10:30 | | | 12:30 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Node 1 | Node 2 | DACF | Merge | Delta | DACF | Merge | Delta | DACF | Merge | Delta | DACF | Merge | Delta |
| FR | CH | SIERENTZ | ASPHARD | 388 | 362 | -26 | 170 | 266 | 96 | 237 | 297 | 60 | 261 | 252 | -9 |
| FR | CH | MAMBELIN | BASSECOURT | -94 | 2 | 96 | -228 | -153 | 75 | -205 | -144 | 61 | -196 | -164 | 32 |
| FR | CH | SIERENTZ | BASSECOURT | 418 | 450 | 32 | 402 | 452 | 50 | 413 | 448 | 35 | 459 | 474 | 15 |
| FR | CH | BOIS TOLLOT | ROMANEL | 213 | 197 | -16 | 45 | -61 | -106 | 35 | -69 | -104 | -16 | -2 | 14 |
| FR | CH | SIERENTZ | LAUFENBURG | 366 | 461 | 95 | 155 | 228 | 73 | 144 | 218 | 74 | 201 | 257 | 56 |
| FR | CH | CORNIER | RIDDES | -13 | 45 | 58 | -57 | -36 | 21 | -67 | -45 | 22 | -80 | -33 | 47 |
| FR | CH | CORNIER | ST TRIPHON | -18 | 33 | 51 | -73 | -52 | 21 | -67 | -55 | 12 | -64 | -48 | 16 |
| FR | CH | PRESSY | VALLORCINES | -120 | -59 | 61 | -178 | -130 | 48 | -193 | -152 | 41 | -198 | -136 | 62 |
| FR | CH | BOIS TOLLOT | VERBOIS | 219 | 282 | 63 | 199 | 257 | 58 | 249 | 293 | 44 | 293 | 294 | 1 |
| FR | CH | GENISSIAT | VERBOIS | 140 | 169 | 29 | 125 | 132 | 7 | 151 | 151 | 0 | 159 | 158 | -1 |
| FR | CH | GENISSIAT | VERBOIS | 140 | 169 | 29 | 125 | 132 | 7 | 151 | 151 | 0 | 159 | 158 | -1 |
| FR | IT | ALBERTVILLE | RONDISSONE | 771 | 546 | -225 | 809 | 785 | -24 | 832 | 811 | -21 | 754 | 724 | -30 |
| FR | IT | ALBERTVILLE | RONDISSONE | 834 | 523 | **-311** | 860 | 818 | -42 | 900 | 849 | -51 | 780 | 731 | -49 |
| FR | IT | MENTON | CAMPOROSSO | 258 | 206 | -52 | 150 | 205 | 55 | 154 | 206 | 52 | 145 | 201 | 56 |
| FR | IT | VILLARODIN | VENAUS | 390 | 619 | 229 | 578 | 740 | 162 | 566 | 742 | 176 | 426 | 553 | 127 |

| | | | | 17:30 | | | 19:30 | | | 23:30 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Node 1 | Node 2 | DACF | Merge | Delta | DACF | Merge | Delta | DACF | Merge | Delta |
| FR | CH | SIERENTZ | ASPHARD | 208 | 301 | 93 | 39 | 114 | 75 | 204 | 176 | -28 |
| FR | CH | MAMBELIN | BASSECOURT | -121 | -58 | 63 | -330 | -238 | 92 | -263 | -207 | 56 |
| FR | CH | SIERENTZ | BASSECOURT | 335 | 373 | 38 | 356 | 389 | 33 | 479 | 466 | -13 |
| FR | CH | BOIS TOLLOT | ROMANEL | 18 | -45 | -63 | 1 | -258 | **-259** | 67 | -5 | -72 |
| FR | CH | SIERENTZ | LAUFENBURG | 155 | 247 | 92 | 46 | 104 | 58 | 209 | 255 | 46 |
| FR | CH | CORNIER | RIDDES | -53 | -18 | 35 | -67 | -78 | -11 | -55 | -17 | 38 |
| FR | CH | CORNIER | ST TRIPHON | -54 | -33 | 21 | -97 | -88 | 9 | -93 | -64 | 29 |
| FR | CH | PRESSY | VALLORCINES | -173 | -118 | 55 | -189 | -174 | 15 | -193 | -151 | 42 |
| FR | CH | BOIS TOLLOT | VERBOIS | 236 | 280 | 44 | 162 | 258 | 96 | 161 | 215 | 54 |
| FR | CH | GENISSIAT | VERBOIS | 148 | 155 | 7 | 95 | 93 | -2 | 112 | 122 | 10 |
| FR | CH | GENISSIAT | VERBOIS | 148 | 155 | 7 | 95 | 93 | -2 | 112 | 122 | 10 |
| FR | IT | ALBERTVILLE | RONDISSONE | 902 | 860 | -42 | 865 | 866 | 1 | 737 | 493 | -244 |
| FR | IT | ALBERTVILLE | RONDISSONE | 1000 | 1017 | 17 | 983 | 974 | -9 | 788 | 467 | **-321** |
| FR | IT | MENTON | CAMPOROSSO | 144 | 205 | 61 | 155 | 198 | 43 | 148 | 200 | 52 |
| FR | IT | VILLARODIN | VENAUS | 742 | 955 | 213 | 896 | 1038 | 142 | 409 | 677 | **268** |

## N state flows at 10:30 and 19:30

The Imax and load values in the table below are extracted from the merged TSOs' DACF.

| TSO | Line (380 kV) | 10:30 | | 19:30 | |
|---|---|---|---|---|---|
| | | Imax (A) | % of Imax | Imax (A) | % of Imax |
| ELIA | Champion - Gramme (32) | 2448 | 38 | 2448 | 41 |
| | Doel - Mercator (51) | 2239 | 33 | 2239 | 38 |
| | Doel - Mercator (52) | 2239 | 33 | 2239 | 38 |
| | Doel - Mercator (54) | 2448 | 33 | 2448 | 38 |
| | Doel - Zandvliet (25) | 2349 | 13 | 2349 | 20 |
| | Mercator - Horta (73) | 2569 | 18 | 2569 | 30 |
| | Courcelles - Gramme (31) | 2257 | 46 | 2349 | 46 |
| | Mercator - Rodenhuize/Horta (74) | 2276 | 20 | 2349 | 32 |
| RTE | Attaques - Warande 2 | 3780 | 52 | 3780 | 56 |
| | Avelin - Gavrelle | 2622 | 18 | 2622 | 38 |
| | Avelin - Warande | 3458 | 16 | 3458 | 9 |
| | Lonny - Seuil | 4149 | 15 | 4149 | 23 |
| | Mandarins - Warande 1 | 3780 | 50 | 3780 | 53 |
| | Muhlbach - Scheer | 2598 | 28 | 2598 | 18 |
| | Revigny - Vigy | 2596 | 24 | 2596 | 36 |
| | Warande - Weppes | 3458 | 21 | 3458 | 16 |

X < 50 % of Imax  50 ≤ X < 75 % of Imax  X ≥ 75 % of Imax

| TSO | Voltage | Line (380 kV) | 10:30 | | 19:30 | |
|---|---|---|---|---|---|---|
| | | | Imax (A) | % of Imax | Imax (A) | % of Imax |
| 50 HzT | 380 kV | Eisenach - Mecklar (450-2) | 2520 | 31 | 2520 | 64 |
| | | Hagenwerder - Mikulowa (567) | 2520 | 21 | 2520 | 21 |
| | | Hagenwerder - Mikulowa (568) | 2520 | 21 | 2520 | 21 |
| | | Remptendorf - Redwitz (413) | 3485 | 55 | 3462 | 63 |
| | | Remptendorf - Redwitz (414) | 3485 | 55 | 3462 | 63 |
| | | Röhrsdorf - Hradec (445) | 2520 | 0 | 2520 | 44 |
| | | Röhrsdorf - Hradec (446) | 2520 | 80 | 2520 | 44 |
| | | Vieselbach - Mecklar (449-1) | 2520 | 30 | 2520 | 61 |
| | | Wolmirstedt - Helmstedt (491-1) | 2400 | 20 | 2400 | 52 |
| | | Wolmirstedt - Helmstedt (492-2) | 2400 | 20 | 2400 | 52 |
| | 220 kV | Vierraden - Krajnik (507) | 1361 | 0 | 1370 | 0 |
| | | Vierraden - Krajnik (508) | 1361 | 0 | 1370 | 0 |

X < 50 % of Imax  50 ≤ X < 75 % of Imax  X ≥ 75 % of Imax

## Special topologies at 10:30 and 19:30

| Nodes in North area | | | | |
|---|---|---|---|---|
| | | | 10:30 | 19:30 |
| 380 kV | Elia | Doel | 1 | 1 |
| | | Avelgem | 1 | 1 |
| | Rte | Warande | 1 | 1 |
| | | Cergy | 2 | 2 |
| | | Terrier | 1 | 1 |
| | | Plessis Gassot | 1 | 1 |
| | | Mery/Seine | 2 | 2 |
| | | Muhlbach | 1 | 1 |
| | | Vigy | 2 | 2 |
| | Transnet bw | Eichstetten | 1 | 1 |
| | Amprion | Uchtelfangen | 1 | 1 |
| | Tennet DE | Redwitz | 1 | 1 |
| | 50 HzT | Remptendorf | 1 | 1 |
| | | Wolmirstedt | 1 | 1 |
| | CEPS | Hradec Vychod | 1 | 1 |
| 220 kV | 50 HzT | Pasewalk | 1 | 1 |

## North analyses results

Security analyses have been performed for 24 timestamps.
All remedial actions have been agreed with concerned TSO during the day ahead process.

### ***Constraints on Elia, RTE (North) and 50HzT 400kV grids and tie-lines***

| TSO | Validity | Contingency | | | | Constraint | | | | | Timestamps of max |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | U (kV) | Substation 1 | Substation 2 | Code | Overload | U (kV) | Substation 1 | Substation 2 | Code | |
| RTE / CREOS | 04:00 - 05:00 | 400 | Vigy | Ensdorf | N-2 | 135% | 220 | Schifflage | PST | | 04:30 |
| | | **Preventive Actions:** Increase 6 taps at Schifflange PST (17 -> 26) => **93% remaining** | | | | | | | | | |
| RTE | 03:00 - 11:00 | 400 | Mandarins - Attaques<br>Mandarins - Warande | | N-2 | 107% (5') | 400/220 | Mandarins | Transformer | | 08:30 |
| | | No cascading effect after tripping. | | | | | | | | | |
| 50HrtZ / CEPS / Tennet DE | 12:00 - 14:00 | 400 | T-Line: Redwitz - Mechlenreuth - Etzenricht | | N-K | 102% | 400 | Hradec | Röhrsdorf | | 13:30 |
| | | **Preventive Actions:** Decrease 4 taps at Hradec PST (0 -> -4) 50Hz info => **95% remaining** | | | | | | | | | |

### ***Constraints greater than 100% on NL + Amprion 400kV grids and greater than 120% on DE, CZ, PL and SK 400kV grids***

| TSO | Validity | Contingency | | | | Constraint | | | | | Timestamps of max |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | U (kV) | Substation 1 | Substation 2 | Code | Overload | U (kV) | Substation 1 | Substation 2 | Code | |
| Tennet NL | 12:00 - 13:00 & 15:00 - 16:00 | 400 | Lelystad | Ens | Axis | 105% | 400 | Lelystad | Ens | Remaining | 12:30 |
| | | **Preventive Actions:** Implement 2-node operation Lelystad => **97% remaining** | | | | | | | | | |
| Tennet NL / Tennet | 03:00 - 06:00 | 400 | Meeden | Diele | Axis | 105% | 400 | Lelystad | Ens | Remaining | 04:30 |
| | | **Preventive Actions:** Decrease 6 taps at Dielle PSTs (33 -> 27) and increase 2 taps at Meeden PSTs (16 -> 18) => **97% remaining** | | | | | | | | | |
| Tennet DE / Amprion | 08:00 - 19:00 | 400 | T-line Diele - Niederlangen - Meppen | | N-K | 114% | 400 | Dörpen West | Hanekenfahr | | 15:30 |
| | | **Preventive Actions:** Decrease 6 taps at Dielle PSTs (33 -> 27) and decrease 1 tap at Meeden PSTs (17 -> 16) => **97% remaining** | | | | | | | | | |

### ***Constraints on ELIA 220/150kV grid at 10:30***

| Contingency | | | | Constraint | | | | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| U (kV) | Substation 1 | Substation 2 | Code | Overload | U (kV) | Substation 1 | Substation 2 | Code | |
| 380 | Mercator | Busbar | 1B | 102% | 150 | Keer | Rodenhuize | | 10:00 - 11:00 |
| **Observability area** | | | | | | | | | |

## 50HzT DC loopflows sensitivity

Vierraden-Krajnik 220kV axis in long term outage till 2018.

## South analyses results

Security analyses have been performed for these 2 timestamps:

- Off-peak period (23:00 – 07:00): **23:30**
- Peak period (07:00 – 23:00): **19:30**

Adaptations made on merged DACFs:

**Off-peak:**

- SI ➔ IT physical flow adapted to the target flow : **1200 MW (agreed by ELES and APG)**
- Mendrisio-Cagno flow adapted to the schedule : **170 MW**
- PST of Lienz adapted to **150 MW**
- PST of Camporosso adapted to **200 MW**

**Peak:**

- SI ➔ IT physical flow adapted to the target flow : **1200 MW (agreed by ELES and APG)**
- Mendrisio-Cagno flow adapted to the schedule : **200 MW**
- PST of Lienz adapted to **150 MW**
- PST of Camporosso adapted to **200 MW**

## Special topologies

| Nodes in South area | | | | |
|---|---|---|---|---|
| | | | Off Peak | Peak |
| 380 kV | Swissgrid | Sils | 1 | 1 |
| | | Robbia | 2 | 2 |
| | Rte | Génissiat | 1 | 1 |
| | | Albertville | 2 | 2 |
| | | Grande Ile | 1 | 1 |
| | Terna | Turbigo | 1 | 1 |
| | | Baggio | 1 | 1 |
| | | Bovisio | 2 | 2 |
| | | Ostiglia | 1 | 1 |

## N state flows Off-Peak & Peak

The Imax and load values in the table below are extracted from the **adapted** merged TSOs' DACF.

| TSO | Voltage | Line (380 kV) | Off Peak | | Peak | |
|---|---|---|---|---|---|---|
| | | | Imax (A) | % of Imax | Imax (A) | % of Imax |
| Terna | 380 kV | Albertville - Rondissone 1 | 2370 | 28 | 2370 | 52 |
| | | Albertville - Rondissone 2 | 2370 | 26 | 2370 | 58 |
| | | Bulciago - Soazza | 2300 | 11 | 2300 | 18 |
| | | Cagno - Mendrisio | 855 | 33 | 855 | 33 |
| | | Musignano - Lavorgo | 2270 | 72 | 2270 | 78 |
| | | Redipuglia - Divaca | 2700 | 56 | 2700 | 52 |
| | | Robbia - San Fiorano | 2530 | 57 | 2530 | 66 |
| | | Robbia - Gorlago | 2530 | 73 | 2530 | 81 |
| | | Venaus - Villarodin | 2715 | 35 | 2715 | 53 |
| | 220 kV | Airolo - Ponte | 900 | 0 | 900 | 0 |
| | | Lienz - Soverzene | 750 | 48 | 750 | 46 |
| | | Menton - Campo Rosso | 1165 | 43 | 1165 | 42 |
| | | Padriciano - Divaca | 960 | 38 | 960 | 68 |
| | | Riddes - Avise | 1010 | 32 | 1010 | 35 |
| | | Riddes - Valpelline | 1010 | 39 | 1010 | 44 |
| | | Serra - Pallanzeno | 900 | 0 | 900 | 0 |

For Terna:

X < 50 % of Imax | 50 ≤ X < 75 % of Imax | X ≥ 75% of Imax

***Sensitivity coefficients for the Pentalateral instruction***

The amount of the control program curtailment on peak and off-peak can be calculated thanks to the sensitivities in the table below:

| | | FR → IT | CH → IT | AT → IT | SI → IT |
|---|---|---|---|---|---|
| Off Peak | Initial physical flows on adapted base case | 1731 | 4056 | 144 | 1188 |
| | Compensation ratio (calculated from NTC) | 39% | 49% | 4% | 8% |
| | Pentalateral impact on physical flows | -30% | -51% | -4% | -15% |
| Peak | Initial physical flows on adapted base case | 2966 | 4594 | 140 | 1235 |
| | Compensation ratio (calculated from NTC) | 38% | 50% | 4% | 9% |
| | Pentalateral impact on physical flows | -29% | -52% | -4% | -15% |

## *OFF PEAK*

***Off Peak constraints on APG, Eles, RTE (South), Swissgrid and Terna 400kV grids and tie-lines***

| | TSO | Contingency | | | | Constraint | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | U (kV) | Substation 1 | Substation 2 | Code | Overload | U (kV) | Substation 1 | Substation 2 | Code |
| **Off Peak** | Terna / ELES / APG / SWG | 380 | Sils - Filisur<br>Robbia - Pradella - Sils | | N-K | 115% | 380 | Lavogo | Musignano | |
| | | | | | | 132% | 220 | Pecchia | Handeck | |
| | | **Preventive action:** Increase targetflow to 1200MW -> 109% remaining on Lavorgo-Musignano<br>then **pentalateral of 1500MW bilaterally (IT/CH)** and increase one tap on Lavorgo PST<br>->86% on Lavorgo-Musignano and 99% on Pecchia-Handeck | | | | | | | | |
| | **After above mentioned PRA no more constraints were detected** | | | | | | | | | |

## *PEAK*

***Peak constraints on APG, Eles, RTE (South), Swissgrid and Terna 400kV grids and tie-lines***

| | TSO | Contingency | | | | Constraint | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | U (kV) | Substation 1 | Substation 2 | Code | Overload | U (kV) | Substation 1 | Substation 2 | Code |
| **Peak** | Terna / SWG | 380 | Robbia - Filisur<br>Robbia - Pradella - Sils | | N-K | 131% | 380 | Lavorgo | Musignano | |
| | | | | | | 140% | 220 | Pecchia | Handeck | |
| | | **Preventive action:** Increase targetflow to 1200MW -> 124% remaining<br>then **pentalateral of 1800MW bilaterally (IT/CH)**<br>-> 93% remaining (96% on Divaca PST) and 109% on Handeck-Pecchia remaining<br>additional **700 MW of bilateral procedure** to solve this constraint . | | | | | | | | |
| | **After above mentioned PRA no more constraints were detected** | | | | | | | | | |

### ***Final PSTs settings***

The tables below present the tap positions and the physical flows on different PSTs with the adaptations described at the top of the page (IT-SI target flow...) and preventive actions (before Pentalateral reduction).

| PST | Off Peak | |
|---|---|---|
| | Tap position | Physical flow to Italy (MW) |
| La Praz (1/33) | 1 | 648 |
| Rondissone 1 (1/33) | 33 | Inv |
| Rondissone 2 (1/33) | 33 | Inv |
| Camporosso (-32/32) | -16 | 202 |
| Lienz (-32/32) | -11 | 146 |
| Padriciano (1/33) | 26 | 143 |
| Divaca (-32/32 each) | -6 | 1050 |

| PST | Peak | |
|---|---|---|
| | Tap position | Physical flow to Italy (MW) |
| La Praz (1/33) | 1 | 892 |
| Rondissone 1 (1/33) | 33 | 927 |
| Rondissone 2 (1/33) | 33 | 826 |
| Camporosso (-32/32) | -9 | 199 |
| Lienz (-32/32) | -16 | 141 |
| Padriciano (1/33) | 22 | 260 |
| Divaca (-32/32 each) | -6 | 978 |

## Conclusion

CWE: Constraints detected, however manageable with topological actions. N-2 contingency list considered for Elia and RTE due to wind storm from 03:00 till 11:00.

CEE: Constraints detected requiring coordination between 50HertZ and CEPS.

CSE: Critical constraints found due to Sils - Soazza 380kV forced outage. Pentalateral reduction procedure of 2500MW between CH - IT needed.