

<p><b><u>CORESΟ Engineers</u></b></p> <p><b><u>North :</u></b> SCHÜLKE Arnaud</p> <p><b><u>South :</u></b> KROMLIDIS Stylianos</p>	<p><b>Day Ahead report for</b></p> <p><b>20 January 2018</b></p>
<p><b>Security Levels:</b></p> <p><b>CWE: Coordination is required for a constraint detected on the FR-BE border at 17:30.</b></p> <p><b>CEE: No critical constraints detected.</b></p> <p><b>CSE: The situation requires coordination between TSOs and preventive topological actions, but remains manageable.</b></p>	

#### Key overall conditions

#### Outages table

#### Exchange program forecasts

#### ELIA expected flows & PSTs tap position

#### CEE Renewable Power Generation & Forecast

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

#### RTE flows on cross-border lines

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

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

#### North analyses results

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

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

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

50HzT DC loopflows sensitivity

#### South analyses results

#### N state flows Off-Peak & Peak

#### Special topologies

Sensitivity coefficients for the Pentalateral instruction

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

Final PSTs settings

#### Conclusion

## 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]	10 600	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	2	1600
				Lippendorf		920	2	1840
RTE			RTE	Gravelines	Pmax (MW)	900	6	5400
Peak load [MW]	68 400	13:00		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]	45 800	17:30		Paluel		1300	3	3900
Generation Margin	Sufficient			Nogent s/ Seine		1300	2	2600
				Bugey		900	3	2700
TERNA				St Alban		1300	2	2600
Peak load [MW]	38 600	19:30		Cruas		900	2	1800
Generation Margin	Sufficient			Tricastin		900	3	2700

### 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:

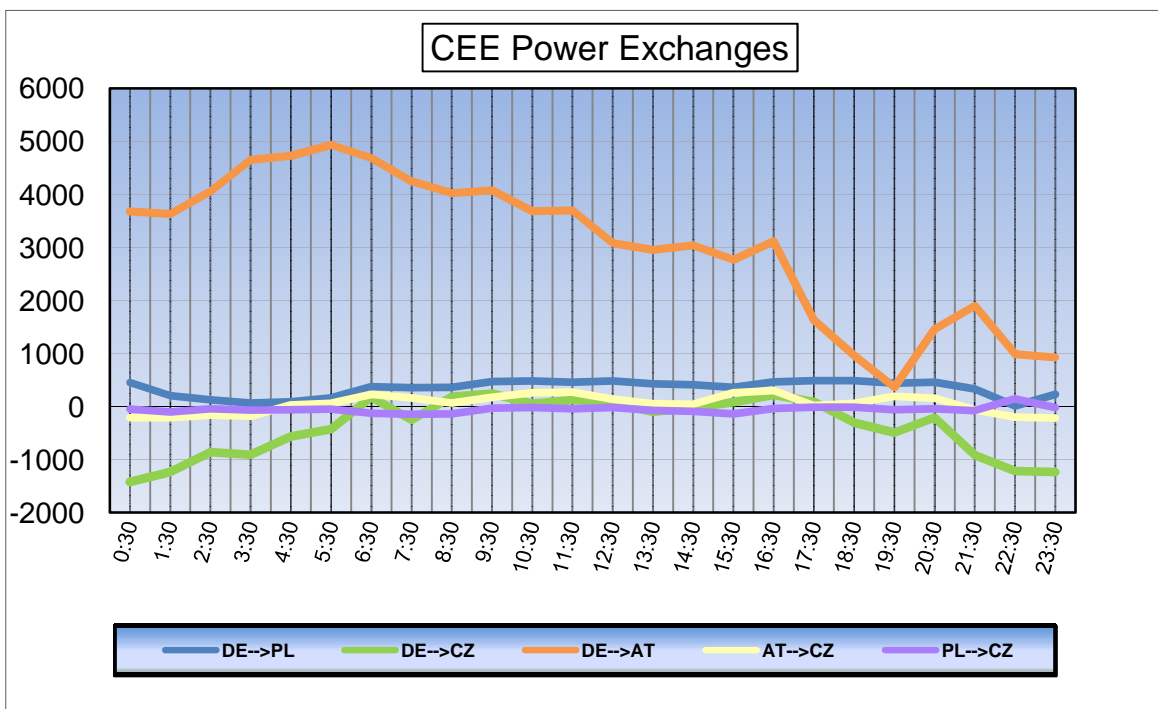
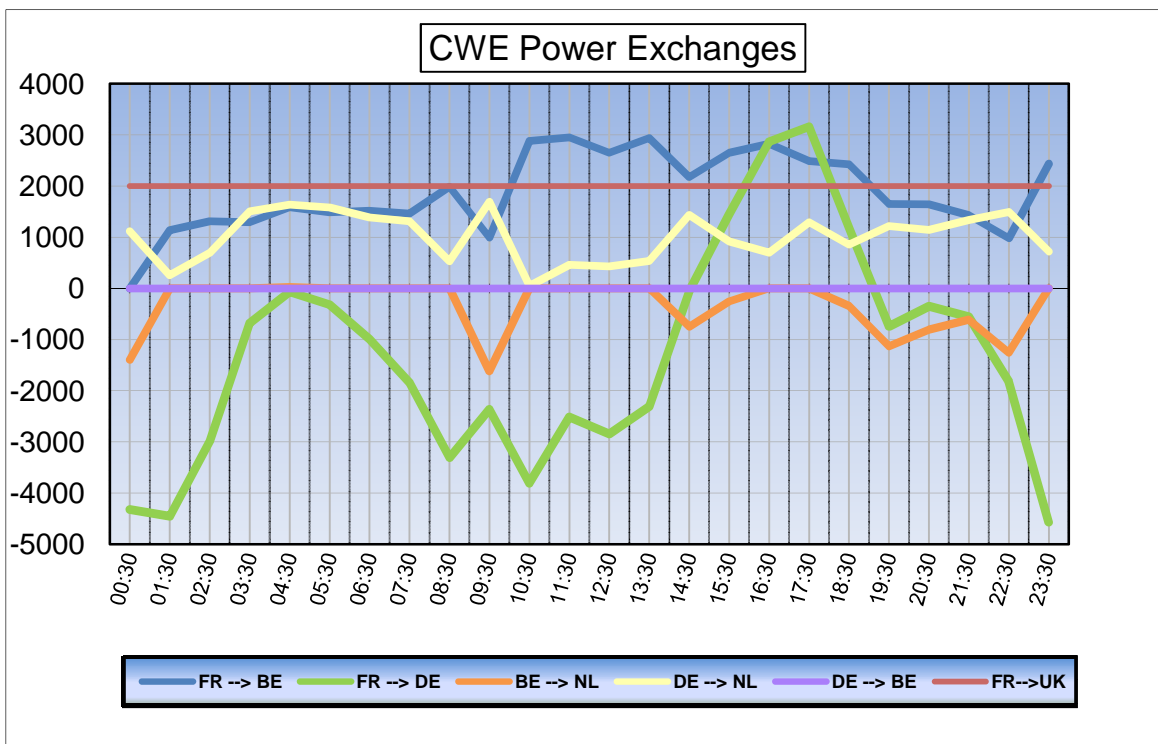
CWE / CEE

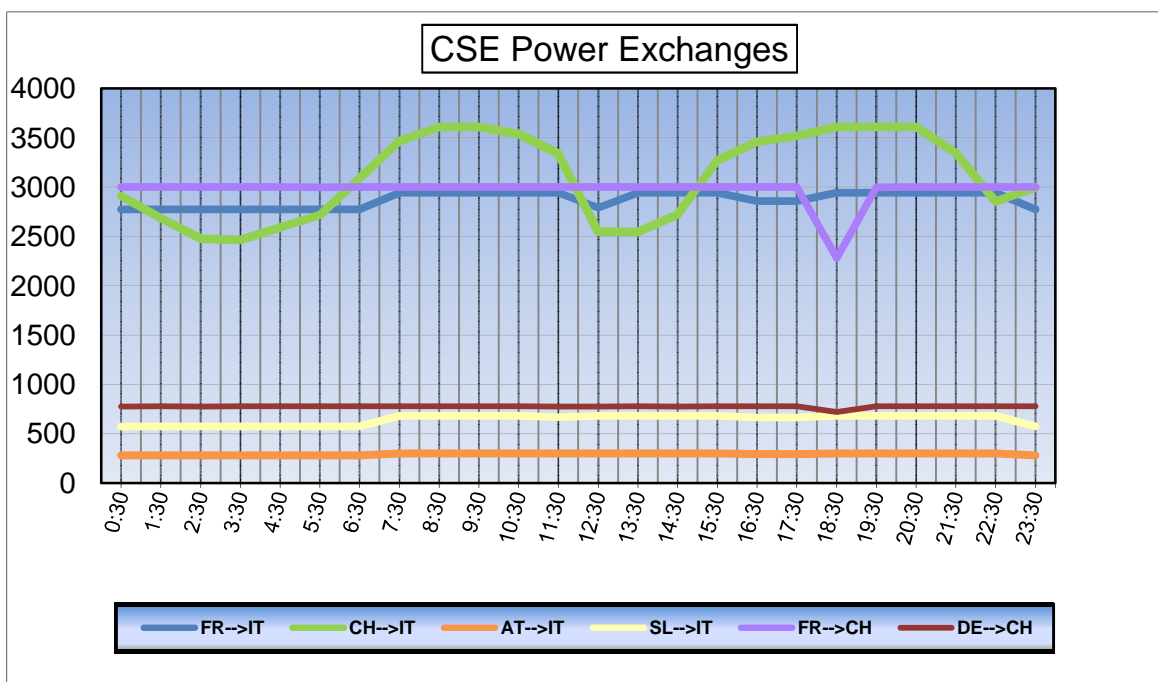
CSE

## Outages table

OUTAGES						
Owner	Type of element	Line name	start	end	Comments	
50HzT	Fossil.Gen	JANSCHWALDE _ Unit E 400 kV	20/01/2018	22/01/2018	250 MW (reduced)	
50HzT	Fossil.Gen	SCHWARZE PUMP _ Unit 2 400 kV	18/01/2018	20/01/2018	755 MW	
50HzT	Hydro.Gen	MARKERSBACH _ Unit D 400 kV	28/09/2017	27/04/2018	160 MW	
50HzT	Line	EULA _ Wolframhausen 357 220 kV	06/10/2017	16/03/2018		
50HzT	Line	HAMBURG Nord _ BRUNSBUTTEL 951 400 kV	14/01/2018	21/01/2018		
50HzT	Line	LUBMIN _ WIKINGER 281 220 kV	26/09/2017	31/01/2018		
50HzT / PSE	Line	KRAJNIK _ VIERRADEN 507 225 kV	22/06/2016	31/05/2018	Long term outage	
50HzT / PSE	Line	KRAJNIK _ VIERRADEN 508 225 kV	22/06/2017	31/05/2018	Long term outage	
AMP / TEN DE	Line	NEHDEN _ TWISTETAL W 400 kV	08/01/2018	23/02/2018	daily	
AMPRION	Line	KOBLENZ _ LIMBURG (Nassau) 400 kV	15/01/2018	21/01/2018	daily	
AMPRION	Line	NEHDEN _ ARPE Sud 400 kV	15/01/2018	02/02/2018		
AMPRION	Line	NEHDEN _ UENTROP Sauerland Nord 400 kV	15/01/2018	02/02/2018	daily	
CEPS	Line	DASNY _ KOCIN 473 400 kV	08/01/2018	26/01/2018		
CEPS / SEPS	Line	NOSOVIC _ 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		
RTE	Nuc.Gen	BUGEY _ Unit 3 (900MW) 400 kV	19/01/2018	20/01/2018		
RTE	Nuc.Gen	CRUAS _ Unit 2 (900MW) 400 kV	02/12/2017	30/03/2018		
RTE	Nuc.Gen	CRUAS _ Unit 3 (900MW) 400 kV	19/01/2018	20/01/2018		
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		
RTE	Nuc.Gen	TRICASTIN _ Unit 1 (900MW) 400 kV	20/01/2018	22/01/2018		
S.GRID	Line	CHAMOSON _ MUHLEBERG "Sanetsch 2" 220 kV	24/10/2017	30/03/2018		
S.GRID	Line	CHATELARD _ NANT DE DRANCE 400 kV	16/01/2018	27/04/2018		
S.GRID	Line	HANDECK _ MOREL 220 kV	17/01/2018	23/01/2018		
S.GRID	Line	LIMMERN _ TIERFEHD 1 400 kV	28/01/2017	31/07/2018		
S.GRID	Line	MOREL _ SERRA 225 kV	16/01/2018	23/01/2018		
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	
S.GRID	Transformer	BASSE COURT _ Transformer 400 kV	13/12/2017	31/03/2018	Trafo 32	
TENNET DE	Fossil.Gen	IRSCHING _ UNIT 4 400 kV	13/01/2018	29/01/2018	545 MW	
TENNET DE	Hydro.Gen	WALDECK _ UNIT 5 400 kV	15/01/2018	30/11/2018	240 MW	
TENNET DE	Hydro.Gen	WALDECK _ UNIT 6 400 kV	15/01/2018	14/02/2018	240 MW	
TENNET DE	Line	GROHNDE _ KLEIN ILSEDE 1 400 kV	18/01/2018	26/01/2018	daily	
TENNET DE	Line	TWISTETAL _ BORKEN 3 400 kV	16/05/2017	11/10/2018		
TENNET DE	Line	WAHLE _ ALGERMISSSEN 2 400 kV	18/01/2018	26/01/2018	daily	
TENNET DE	Line	WAHLE _ KLEIN ILSEDE 3 380 kV	18/01/2018	26/01/2018	daily	
TENNET NL	Line	BLEISWIJK _ KRIMPEN ZT 400 kV	20/01/2018	26/01/2018		
TENNET NL	Line	HENGEL _ ZWOLLE WT 400 kV	13/01/2018	26/01/2018		
TERNA / S.GRID	Line	PALLANZENO _ SERRA 225 kV	16/01/2018	23/01/2018		

## Exchange program forecasts





## ELIA expected flows & PSTs tap position

		Node 1	Node 2	Order	00:30	03:30	04:30	07:30	08:30	10:30	12:30	17:30	18:30	19:30	21:30	23:30
BE	FR	ACHENE	LONNY	380.19	365	-179	-299	-17	31	-42	-105	-504	-330	-133	-85	118
BE	FR	AUBANGE	MONT ST MARTIN	220.51	48	-107	-140	-42	-20	-69	-73	-205	-159	-103	-83	-21
BE	FR	AUBANGE	MOULAIN	220.51	33	-114	-145	-43	-30	-76	-88	-205	-150	-110	-86	-24
BE	FR	AVELGEM	AVELIN	380.80	313	-551	-677	-480	-318	-405	-490	-1315	-937	-577	-472	-201
BE	FR	AVELGEM	MASTAING	380.79	8	-333	-392	-345	-289	-364	-423	-777	-619	-448	-362	-249
BE	FR	MONCEAU	CHOOZ	220.48	-104	-169	-181	-160	-167	-205	-218	-292	-266	-239	-194	-178
BE	NL	VAN EYCK 1	MAASBRACHT	380.27	-543	-182	-150	-299	-386	-470	-413	-115	-287	-424	-363	-607
BE	NL	VAN EYCK 2	MAASBRACHT	380.28	-236	282	284	235	55	-56	115	734	394	80	90	-275
BE	NL	ZANDVLIET	BORSSELE	380.29	-715	-176	-152	-252	-578	-795	-733	-441	-613	-739	-481	-552
BE	NL	ZANDVLIET	GEERTRUIDENBERG	380.30	-412	209	258	5	-201	-315	-192	306	11	-209	-96	-416
BE	LU	BELVAL	SCHIFFLANGE	220.511	-165	11	15	-47	-68	-71	-17	338	204	136	99	-50

BE	FR	TOTAL		663	-1453	-1834	-1087	-793	-1161	-1397	-3298	-2461	-1610	-1282	-555
BE	NL	TOTAL		-1906	133	240	-311	-1110	-1636	-1223	484	-495	-1292	-850	-1850
BE	LU	TOTAL		-165	11	15	-47	-68	-71	-17	338	204	136	99	-50
TOTAL BELGIAN IMPORT/EXPORT				-1408	-1309	-1579	-1445	-1971	-2868	-2637	-2476	-2752	-2766	-2033	-2455

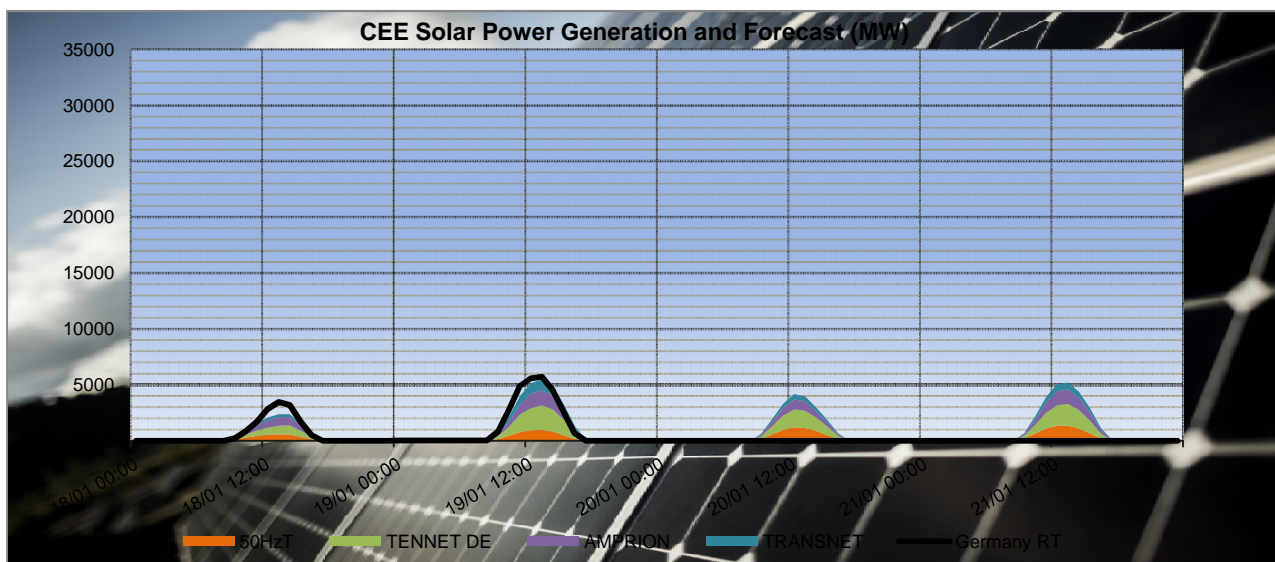
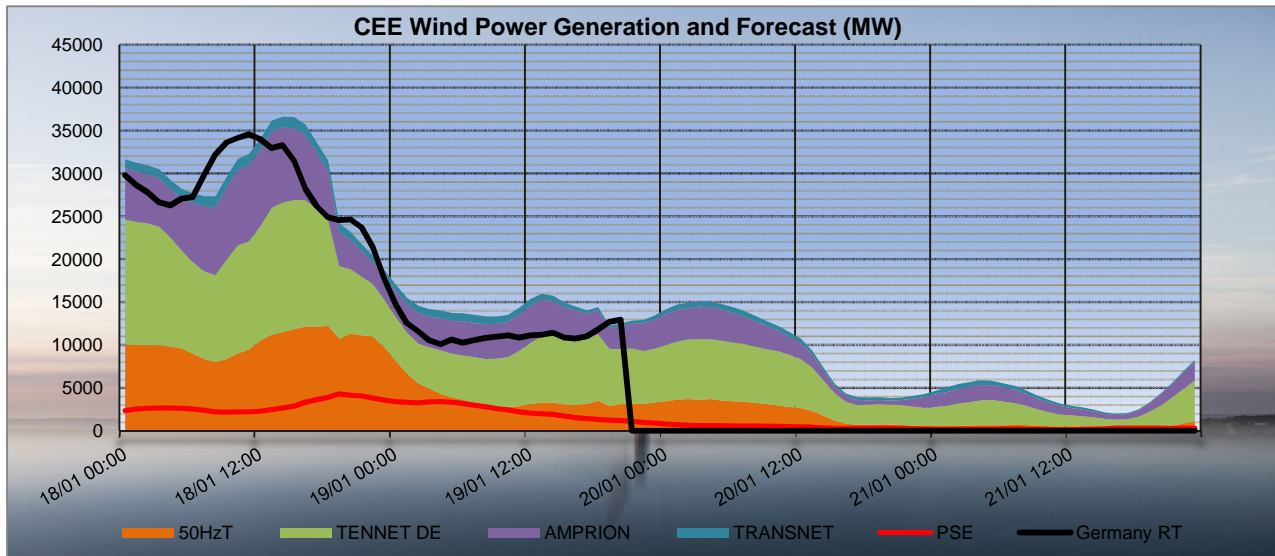
PST taps in DACF	Zandvliet 1	12	12	12	12	12	12	12	12	18	18	18	18	18
	Zandvliet 2	12	12	12	12	12	12	12	12	18	18	18	18	18
	Van Eyck 1	12	12	12	12	12	12	12	12	18	18	18	18	18
	Van Eyck 2	12	12	12	12	12	12	12	12	18	18	18	18	18
	Average	12	12	12	12	12	12	12	12	18	18	18	18	18

CREOS PST in DACF	Schiffange	17	17	17	17	17	17	17	17	17	17	17	17	17
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### Proposal for real time after D-1 studies

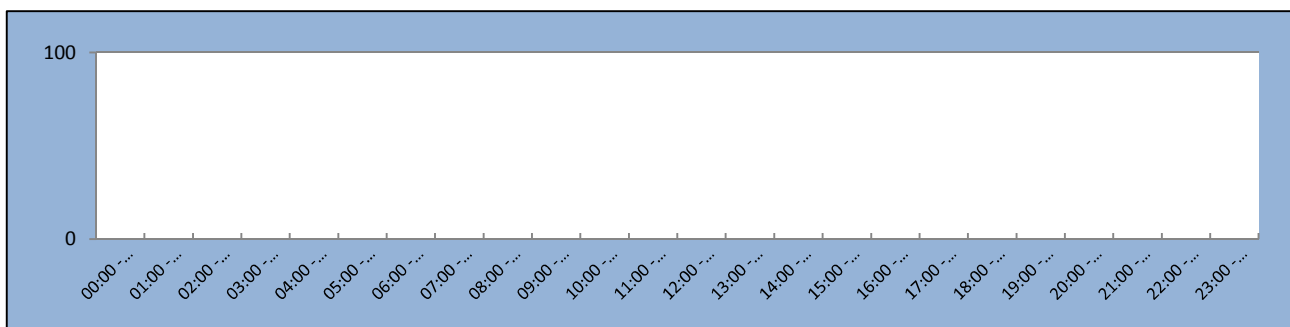
Timestamps	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
PSTs																								
Zandvliet PST 1	[1;35]	12	12	12	12	12	12	12	12	12	12	12	12	12	18	18	18	18	18	18	18	18	18	18
Zandvliet PST 2	[1;35]	12	12	12	12	12	12	12	12	12	12	12	12	12	18	18	18	18	18	18	18	18	18	18
Van Eyck PST 1	[1;35]	12	12	12	12	12	12	12	12	12	12	12	12	12	18	18	18	18	18	18	18	18	18	18
Van Eyck PST 2	[1;35]	12	12	12	12	12	12	12	12	12	12	12	12	12	18	18	18	18	18	18	18	18	18	18
Schiffange PST 1	[1;35]	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	19	17	17	17	17	17	17

## CEE Renewable Power Generation & Forecast

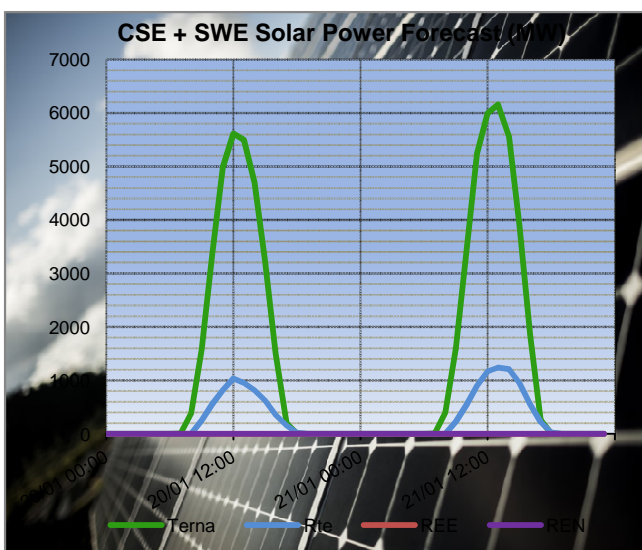
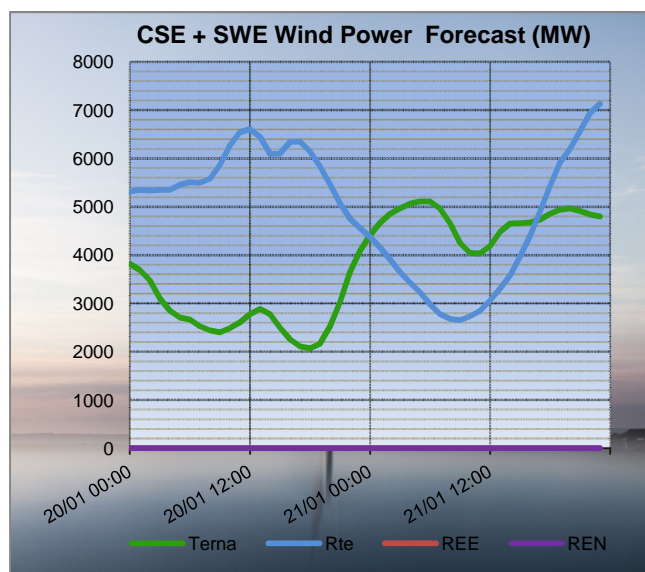
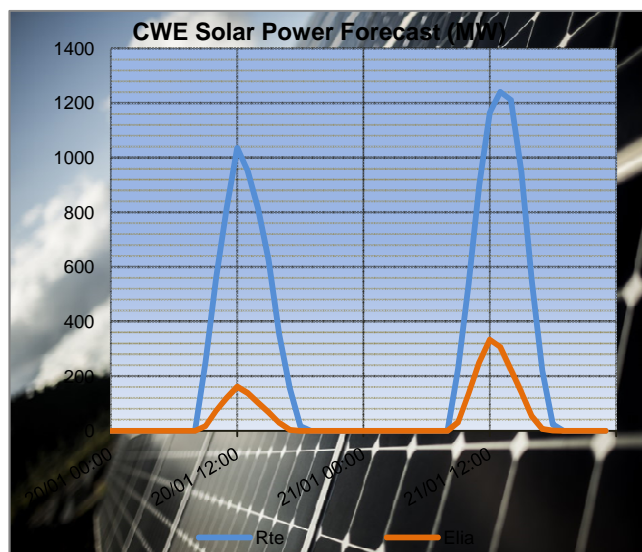
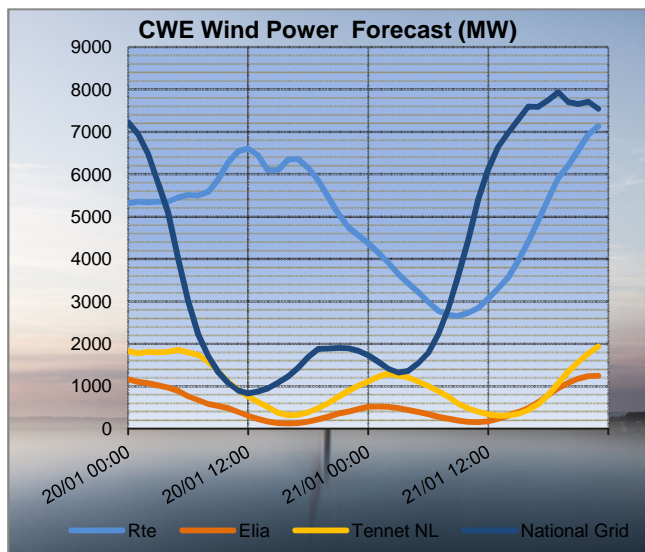


The charts above show the wind and solar generation forecasts for the TSOs in CEE (most significant) from D+1 until D-2 and the realised generation in Germany in real time. Source: Meteologica and 50HzT (RT)

## 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	229	179	-50	155	17	-138	208	42	-166	179	105	-74
FR	BE	MONT ST MARTIN	AUBANGE	72	107	35	8	42	34	45	69	24	5	73	68
FR	BE	MOULAIN	AUBANGE	80	114	34	10	43	33	53	76	23	24	88	64
FR	BE	AVELIN	AVELGEM	463	551	88	408	480	72	448	405	-43	468	490	22
FR	BE	MASTAING	AVELGEM	306	333	27	323	345	22	418	364	-54	445	423	-22
FR	BE	CHOOZ	MONCEAU	0	169	169	0	160	160	0	205	205	0	218	218
FR	DE	MUHLBACH	EICHSTETTEN	539	652	113	359	424	65	240	299	59	323	288	-35
FR	DE	VOGELGRUN	EICHSTETTEN	28	89	61	-19	79	98	-35	36	71	-9	47	56
FR	DE	ST AVOLD	ENSDORF	0	0	0	0	0	0	0	0	0	0	0	0
FR	DE	VIGY	ENSDORF 1	334	377	43	177	226	49	91	171	80	180	276	96
FR	DE	VIGY	ENSDORF 2	359	415	56	196	257	61	105	204	99	202	318	116

				17:30			19:30			23:30		
		Node 1	Node 2	DACF	Merge	Delta	DACF	Merge	Delta	DACF	Merge	Delta
FR	BE	LONNY	ACHENE	608	504	-104	268	133	-135	108	-118	-226
FR	BE	MONT ST MARTIN	AUBANGE	60	205	145	-26	103	129	-7	21	28
FR	BE	MOULAIN	AUBANGE	67	205	138	-13	110	123	-3	24	27
FR	BE	AVELIN	AVELGEM	1163	1315	152	622	577	-45	321	201	-120
FR	BE	MASTAING	AVELGEM	723	777	54	515	448	-67	353	249	-104
FR	BE	CHOOZ	MONCEAU	0	292	292	0	239	239	0	178	178
FR	DE	MUHLBACH	EICHSTETTEN	1097	868	-229	506	425	-81	140	195	55
FR	DE	VOGELGRUN	EICHSTETTEN	190	174	-16	48	99	51	-47	41	88
FR	DE	ST AVOLD	ENSDORF	0	0	0	0	0	0	0	0	0
FR	DE	VIGY	ENSDORF 1	1053	1137	84	348	549	201	-189	147	336
FR	DE	VIGY	ENSDORF 2	1109	1207	98	379	599	220	-175	176	351

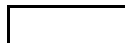
				03:30			07:30			10:30			12:30		
		Node 1	Node 2	DACF	Merge	Delta	DACF	Merge	Delta	DACF	Merge	Delta	DACF	Merge	Delta
FR	CH	SIERENTZ	ASPHARD	402	401	-1	373	348	-25	235	289	54	252	262	10
FR	CH	MAMBELIN	BASSECCOURT	-131	-41	90	-189	-109	80	-266	-153	113	-200	-136	64
FR	CH	SIERENTZ	BASSECCOURT	490	463	-27	450	468	18	405	440	35	399	415	16
FR	CH	BOIS TOLLLOT	ROMANEL	165	151	-14	117	124	7	59	-31	-90	85	113	28
FR	CH	SIERENTZ	LAUFENBURG	332	465	133	293	373	80	210	299	89	206	216	10
FR	CH	CORNIER	RIDDES	-32	26	58	-33	23	56	-64	-20	44	-38	13	51
FR	CH	CORNIER	ST TRIPHON	-37	-25	12	-60	-25	35	-93	-60	33	-48	-23	25
FR	CH	PRESSY	VALLORCINES	-135	-79	56	-149	-78	71	-223	-140	83	-208	-85	123
FR	CH	BOIS TOLLLOT	VERBOIS	152	128	-24	125	140	15	128	172	44	188	179	-9
FR	CH	GENISSIAT	VERBOIS	171	144	-27	141	142	1	117	117	0	155	149	-6
FR	CH	GENISSIAT	VERBOIS	171	144	-27	141	142	1	117	117	0	155	149	-6
FR	IT	ALBERTVILLE	RONDISSONE	746	471	-275	818	627	-191	840	667	-173	785	619	-166
FR	IT	ALBERTVILLE	RONDISSONE	808	347	-461	913	388	-525	928	687	-241	861	610	-251
FR	IT	MENTON	CAMPOROSSO	252	196	-56	159	197	38	145	192	47	155	193	38
FR	IT	VILLARODIN	VENAUS	445	630	185	539	696	157	610	556	-54	631	581	-50

				17:30			19:30			23:30		
		Node 1	Node 2	DACF	Merge	Delta	DACF	Merge	Delta	DACF	Merge	Delta
FR	CH	SIERENTZ	ASPHARD	536	437	-99	325	212	-113	235	148	-87
FR	CH	MAMBELIN	BASSECCOURT	134	157	23	-90	-71	19	-236	-207	29
FR	CH	SIERENTZ	BASSECCOURT	290	322	32	373	368	-5	485	453	-32
FR	CH	BOIS TOLLLOT	ROMANEL	12	55	43	-24	-43	-19	73	44	-29
FR	CH	SIERENTZ	LAUFENBURG	408	416	8	254	246	-8	230	205	-25
FR	CH	CORNIER	RIDDES	-13	43	56	-53	-4	49	-61	-29	32
FR	CH	CORNIER	ST TRIPHON	-4	20	24	-74	-28	46	-91	-79	12
FR	CH	PRESSY	VALLORCINES	-175	-70	105	-229	-98	131	-197	-152	45
FR	CH	BOIS TOLLLOT	VERBOIS	237	213	-24	193	191	-2	137	134	-3
FR	CH	GENISSIAT	VERBOIS	185	169	-16	148	134	-14	134	118	-16
FR	CH	GENISSIAT	VERBOIS	185	169	-16	148	134	-14	134	118	-16
FR	IT	ALBERTVILLE	RONDISSONE	1018	876	-142	873	738	-135	699	582	-117
FR	IT	ALBERTVILLE	RONDISSONE	1131	948	-183	976	808	-168	752	564	-188
FR	IT	MENTON	CAMPOROSSO	149	192	43	149	195	46	153	194	41
FR	IT	VILLARODIN	VENAUS	875	850	-25	751	750	-1	439	456	17

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

The I<sub>max</sub> and load values in the table below are extracted from the merged TSOs' DACF.

TSO	Line (380 kV)	10:30		19:30	
		I <sub>max</sub> (A)	% of I <sub>max</sub>	I <sub>max</sub> (A)	% of I <sub>max</sub>
ELIA	Champion - Gramme (32)	2448	43	2448	46
	Doel - Mercator (51)	2239	37	2239	35
	Doel - Mercator (52)	2239	37	2239	35
	Doel - Mercator (54)	2448	37	2448	35
	Doel - Zandvliet (25)	2349	19	2349	14
	Mercator - Horta (73)	2569	23	2569	18
	Courcelles - Gramme (31)	2349	49	2349	53
	Mercator - Rodenhuize/Horta (74)	2349	28	2349	22
RTE	Attaques - Warande 2	3780	51	3780	50
	Avelin - Gavrelle	2622	11	2622	6
	Avelin - Warande	3458	18	3458	20
	Lonny - Seuil	4149	16	4149	11
	Mandarins - Warande 1	3780	48	3780	46
	Muhlbach - Scheer	2598	27	2598	20
	Revigny - Vigy	2596	27	2596	16
	Warande - Weppes	3458	23	3458	25



X < 50 % of I<sub>max</sub>

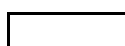


50 ≤ X < 75 % of I<sub>max</sub>



X ≥ 75 % of I<sub>max</sub>

TSO	Voltage	Line (380 kV)	10:30		19:30	
			I <sub>max</sub> (A)	% of I <sub>max</sub>	I <sub>max</sub> (A)	% of I <sub>max</sub>
50 HzT	380 kV	Eisenach - Mecklar (450-2)	2520	16	2520	28
		Hagenwerder - Mikulowa (567)	2520	32	2520	20
		Hagenwerder - Mikulowa (568)	2520	32	2520	20
		Remptendorf - Redwitz (413)	3551	42	3551	31
		Remptendorf - Redwitz (414)	3551	42	3551	31
		Röhrsdorf - Hradec (445)	2520	38	2520	14
		Röhrsdorf - Hradec (446)	2520	38	2520	14
		Vieselbach - Mecklar (449-1)	2520	18	2520	30
		Wolmirstedt - Helmstedt (491-1)	2400	2	2400	14
		Wolmirstedt - Helmstedt (492-2)	2400	2	2400	14
	220 kV	Vierraden - Krajnik (507)	1370	0	1370	0
		Vierraden - Krajnik (508)	1370	0	1370	0



X < 50 % of I<sub>max</sub>



50 ≤ X < 75 % of I<sub>max</sub>



X ≥ 75 % of I<sub>max</sub>

## 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	2	2
		Vigy	1	1
	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	
Elia / Rte	17:30	380	Avelin	Avelgem		104%	380	Avelgem	Mastaing		17:30
						107%	380	Monceau	Transformer		
		<b>Curative actions:</b> 2 nodes in Mastaing (by opening busbar coupler 1A/2A and 1B/2B) or 2 nodes in Avelgem => 96% remaining on Avelgem - Mastaing. Then open one transformer (AT762) in Mazures + 2 nodes in Chooz 220 kV => 98% remaining on Monceau transformer (or open the transformer)  <u>Note:</u> 2 nodes topology in Monceau 150 kV has a low impact on the Monceau transformer constraint (around 1%).									
Elia / Rte	17:30	380	Avelgem	Mastaing		102%	380	Avelin	Avelgem		17:30
		<b>Curative action:</b> 2 nodes in Avelin (by opening busbar coupler 1A/2A and 1B/2B) => 96% remaining. OR 2 nodes in Avelgem => 95% remaining.									
Creos / Elia / Rte	17:30	380	Vigy	Ensdorf	2	113%	220	Schiffange	PST		17:30
		<b>Preventive action:</b> +2 taps (from 17 to 19) on Schiffange PST => 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	
No constraint detected											

### 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	
No constraint detected									

## 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): **00:30**
- Peak period (07:00 – 23:00): **08:30**

Adaptations made on merged DACFs:

### Off-peak:

- SI → IT physical flow adapted to the target flow : **800 MW**
- Mendrisio-Cagno flow adapted to the schedule : **191 MW**
- PST of Lienz adapted to **150 MW**
- PST of Camporosso adapted to **200 MW**
- PSTs of Rondisonne adapted to **tap 33**

### Peak:

- SI → IT physical flow adapted to the target flow : **800 MW**
- 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 I<sub>max</sub> and load values in the table below are extracted from the **adapted** merged TSOs' DACF.

TSO	Voltage	Line (380 kV)	Off Peak		Peak	
			I <sub>max</sub> (A)	% of I <sub>max</sub>	I <sub>max</sub> (A)	% of I <sub>max</sub>
Terna	380 kV	Albertville - Rondissone 1	2370	26	2370	29
		Albertville - Rondissone 2	2370	17	2370	24
		Bulciago - Soazza	2300	41	2300	52
		Cagno - Mendrisio	855	36	855	36
		Musignano - Lavorgo	2270	64	2270	75
		Redipuglia - Divaca	2450	38	2450	39
		Robbia - San Fiorano	2530	51	2530	65
		Robbia - Gorlago	2530	59	2530	69
		Venaus - Villarodin	2715	33	2715	38
	220 kV	Airolo - Ponte	900	0	900	0
		Lienz - Soverzene	704	40	704	46
		Menton - Campo Rosso	1165	41	1165	44
		Padriciano - Divaca	960	39	960	39
		Riddes - Avise	1010	18	1010	23
		Riddes - Valpelline	1010	21	1010	26
		Serra - Pallanzeno	900	25	900	43

For Terna:

<div></div>	X < 50 % of I <sub>max</sub>	<div></div>	50 ≤ X < 75 % of I <sub>max</sub>	<div></div>	X ≥ 75% of I <sub>max</sub>
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### 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	1511	4002	112	790
	Compensation ratio (calculated from NTC)	41%	46%	4%	9%
	Pentalateral impact on physical flows	-27%	-54%	-4%	-15%
Peak	Initial physical flows on adapted base case	1774	4797	128	792
	Compensation ratio (calculated from NTC)	39%	48%	4%	9%
	Pentalateral impact on physical flows	-27%	-54%	-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										
No constraint 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/ Swissgrid	380	Robbia	S.Fiorano	N-2	112%	380	Sils	Soazza	
				Gorlago						
				Preventive actions: 2 nodes topology at Sils 380kV (agreed by SWG) => 101% remaining. And increase Rondissone PSTs to maximum tap (33) => 97% remaining.						
	Terna/ Swissgrid	380	Robbia	Filsur	N-2	108%	380	Lavorgo	Musignano	
				Pradella-Sils						
				Preventive actions: 2 nodes topology at Mettlen 380kV and increase 7 taps (5->12) at Lavorgo PST (agreed by SWG) => 99% remaining.						

### 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	622
Rondissone 1 (1/33)	0	271
Rondissone 2 (1/33)	8	425
Camporosso (-32/32)	-15	193
Lienz (-32/32)	-11	113
Padriciano (1/33)	29	144
Divaca (-32/32 each)	-18	647

PST	Peak	
	Tap position	Physical flow to Italy (MW)
La Praz (1/33)	1	708
Rondissone 1 (1/33)	0	385
Rondissone 2 (1/33)	6	474
Camporosso (-32/32)	-12	209
Lienz (-32/32)	-12	129
Padriciano (1/33)	24	142
Divaca (-32/32 each)	-9	651

## Conclusion

CWE: Coordination is required for a constraint detected on the FR-BE border at 17:30.

CEE: No critical constraints detected.

CSE: The situation requires coordination between TSOs and preventive topological actions, but remains manageable.