CORESO Engineers ***North :*** ROCHET Jonathan ***South :*** GOSSIAUX Alain LEROY-BIASUTTI Emilie	**Day Ahead report for** **01 February 2018**

Security Levels:

CWE: Topological changes in Diele PSTs and Meeden PSTs to solve constraints. N-state overload detected between TenneT DE and Amprion.
Constraint detected in Mercator - Doel area requiring low tap position in Zandvliet PSTs to solve

CEE: Several constraints detected in 50Hertz area require topological actions and redispatching to solve.

CSE : Constraints detected on CH-IT border require an increase of the SI-IT target flow from 800 to 1150 MW and maximum tap postion on both Rondissone PSTs for peak hour.

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]	11 200	17:00		Tihange		1000	2	2900
						450	2	
Generation Margin	Tight			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]	77 400	17:00		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]	46 100	17:30		Paluel		1300	**3**	3900
Generation Margin	Sufficient			Nogent s/ Seine		1300	2	2600
				Bugey		900	4	3600
TERNA				St Alban		1300	2	2600
Peak load [MW]	47014	18:30		Cruas		900	**3**	2700
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

CSE

For all the timestamps, we did a model improvement to take into account the return of the 220 kV Airolo-Ponte-Fiesch line.

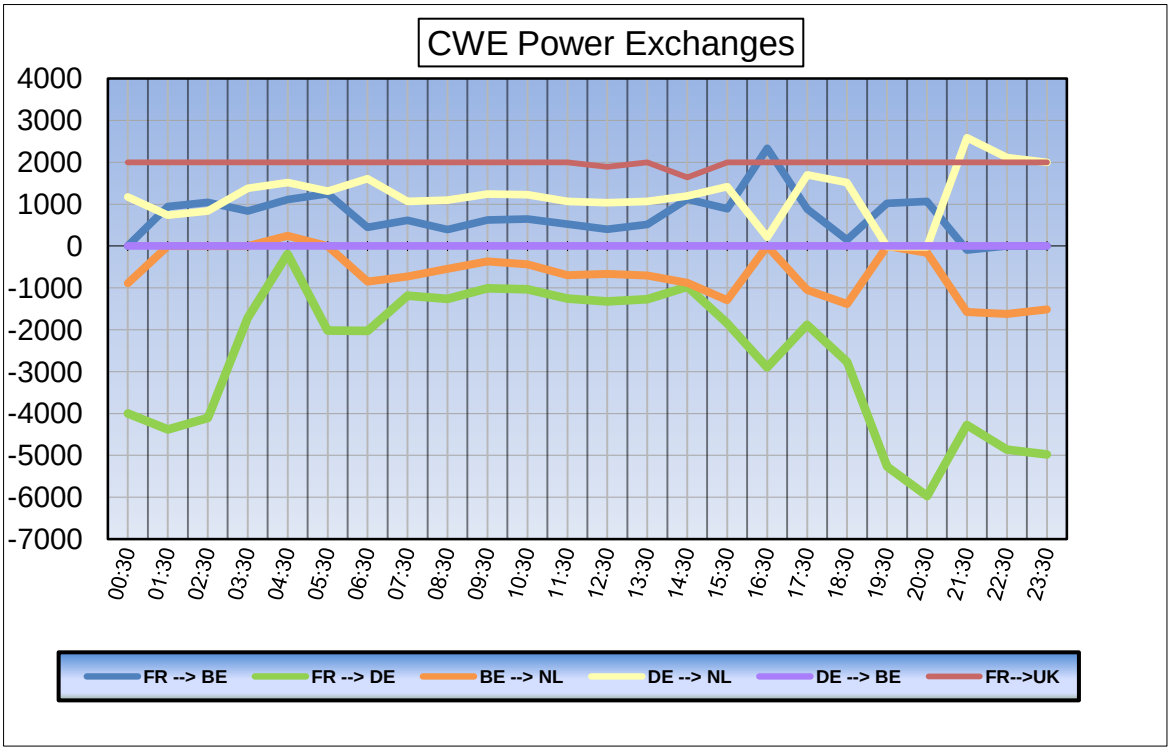
We took into account the unforseen outage of the 400 kV St Vulbas-Creys n°1 for the peak and the off-peak.

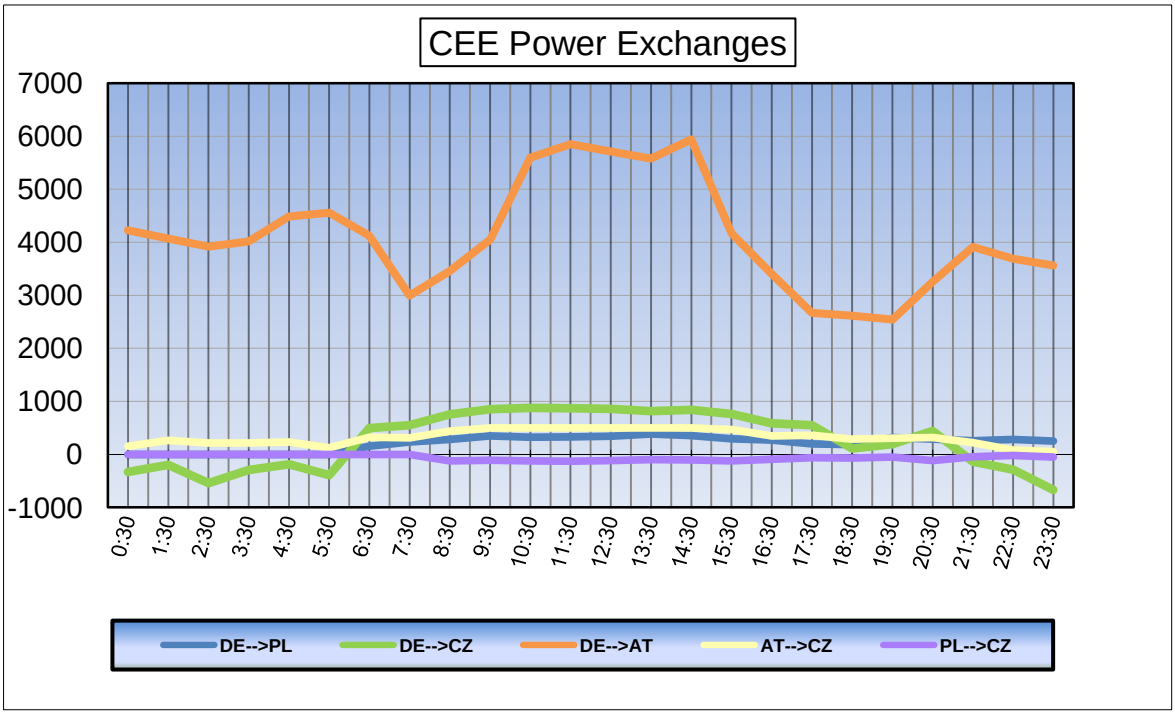
Outages table

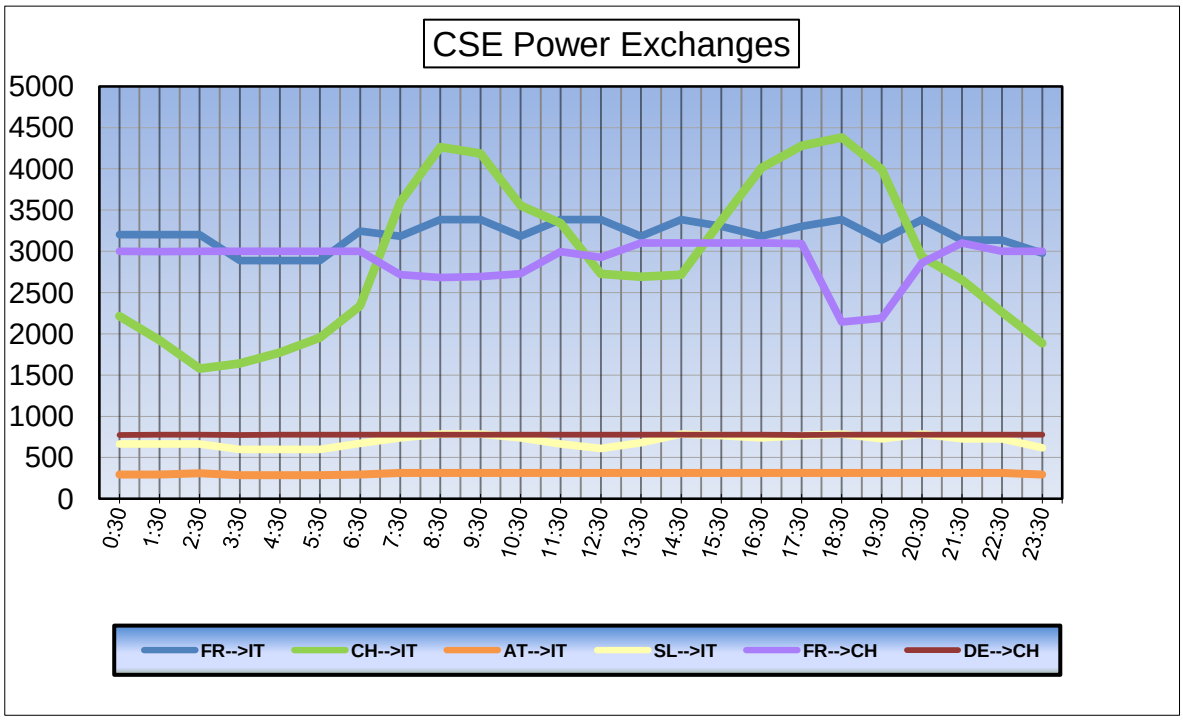
OUTAGES					
Owner	Type of element	Line name	start	end	Comments
50HzT	Hydro.Gen	MARKERSBACH _ Unit D 400 kV	28/09/2017	27/04/2018	160 MW
50HzT	Hydro.Gen	MARKERSBACH _ Unit E 400 kV	01/02/2018	01/02/2018	160 MW
50HzT	Line	EULA _ Wolkramhausen 357 220 kV	28/01/2018	04/02/2018	
50HzT	Line	GUSTROW _ LUBMIN 512 400 kV	01/02/2018	01/02/2018	
50HzT	Line	GUSTROW _ SIEDENBRUNZOW 512 380 kV	01/02/2018	01/02/2018	
50HzT	Line	HAGENWERDER _ SCHMÖLLN 554 400 kV	21/01/2018	14/02/2018	
50HzT	Line	HAMBURG Nord _ HAMBURG Ost 962 400 kV	29/01/2018	23/02/2018	
50HzT	Line	RAGOW _ WUSTERMARK 521 400 kV	28/01/2018	04/02/2018	
50HzT	Line	STENDAL WEST _ WOLMIRSTEDT 489 400 kV	30/01/2018	01/02/2018	Daily
50HzT	Line	WOLMIRSTEDT _ WUSTERMARK 494 400 kV	28/01/2018	04/02/2018	
50HzT / CEPS	Line	HRADEC VYCHOD _ ROHRSDORF 445 400 kV	29/01/2018	02/02/2018	
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
AMPRION	Line	DÖRPEN WEST _ MEPPEN Emsland Ost weiss 400 kV	01/02/2018	01/02/2018	
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
APG	Line	ST PETER _ Salzburg 455 220 kV	29/01/2018	02/02/2018	
CEPS	Line	BABYLON _ BEZDECIN 451 400 kV	01/02/2018	20/02/2018	
CEPS	Line	KOCIN _ REPORYJE 1 400 kV	29/01/2018	15/02/2018	
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	
ELES / HOPS	Line	KRSKO _ TUMBRI 2 400 kV	22/01/2018	02/03/2018	
ELIA	Line	DOEL _ MERCATOR 52 400 kV	01/02/2018	02/02/2018	
ELIA	Line	GEZELLE _ MAERLANT 109 400 kV	25/01/2018	09/02/2018	
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	Line	MAERLANT _ GEZELLE 110 400 kV	25/01/2018	09/02/2018	
ELIA	Nuc.Gen	DOEL _ Unit 3 (1000MW) 400 kV	23/09/2017	16/04/2018	Forced outage
ELIA / TEN NL	Tie - line	MAASBRACHT _ VANEYCK 27 400 kV	31/01/2018	02/02/2018	
PSE	Line	CZARNA _ PASIKUROWICE 400 kV	27/01/2018	02/02/2018	
PSE	Line	POLANIEC _ TARNOW 400 kV	22/01/2018	02/02/2018	daily
PSE	Line	TUCZNAWA _ RZESZOW 400 kV	29/01/2018	02/02/2018	daily
RTE	Line	CHEVALET _ ARGOEUVES 1 380 kV	24/01/2018	23/02/2018	
RTE	Line	CHEVALET _ WARANDE 2 400 kV	31/01/2018	01/02/2018	
RTE	Line	COULANGE _ PIVOZ CORDIER 2 400 kV	29/01/2018	02/02/2018	
RTE	Line	GENISSIAT _ VIELMOULIN 1 400 kV	29/01/2018	23/02/2018	
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	

Owner	Type of element	Line name	start	end	Comments
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	06/02/2018	
S.GRID	Line	LIMMERN _ TIERFEHD 1 400 kV	28/01/2018	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
S.GRID	Transformer	BASSECOURT _ Transformer 400 kV	13/12/2017	31/03/2018	Trafo 32
TEN DE / APG	Line	SILZ _ OBERBRUNN 220 kV	30/01/2018	**01/02/2018**	
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	ELSEN _ TWISTETAL 1 400 kV	**01/02/2018**	02/02/2018	
TENNET DE	Line	JARDELUND _ AUDORF Grün 380 kV	22/01/2018	09/02/2018	daily
TENNET DE	Line	OBERBACHERN _ OBERBRUNN 220 kV	30/01/2018	**01/02/2018**	
TENNET DE	Line	PLEINTIG _ KUPPLUNG 380 kV	22/01/2018	26/02/2018	
TENNET DE	Line	TWISTETAL _ BORKEN 3 400 kV	16/05/2017	11/10/2018	
TENNET DE	Line	WURGASSEN _ GROHNDE 2 400 kV	22/01/2018	02/02/2018	daily
TENNET NL	Line	BLEISWIJK _ KRIMPEN WT 400 kV	29/01/2018	02/02/2018	
TENNET NL	Line	BLEISWIJK _ KRIMPEN ZT 400 kV	29/01/2018	02/02/2018	
TERNA / S.GRID	Line	AVEGNO _ CAVERGNO 220 kV	31/01/2018	02/02/2018	
TERNA / S.GRID	Line	AVEGNO _ GORDUNO 1 220 kV	31/01/2018	02/02/2018	
TransnetBW	Line	BUNZWANGEN _ LAICHINGEN Grün 380 kV	01/01/2018	24/02/2018	
TransnetBW	Line	NEUROTT _ PHILIPPSBURG RT 400 kV	15/01/2018	07/02/2018	daily

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	07:30	08:30	10:30	12:30	13:30	14:30	17:30	18:30	19:30	20:30	23:30
BE	FR	ACHENE	LONNY	380.19	35	164	195	148	193	168	5	-5	251	485	488	367
BE	FR	AUBANGE	MONT ST MARTIN	220.51	-7	44	57	30	12	18	-21	8	92	125	109	97
BE	FR	AUBANGE	MOULAINE	220.51	-19	33	43	19	-3	5	-33	2	72	107	85	80
BE	FR	AVELGEM	AVELIN	380.80	-131	87	217	196	225	160	-96	-99	262	604	602	400
BE	FR	AVELGEM	MASTAING	380.79	-103	-174	-82	-90	-72	-100	-275	-273	-144	22	40	-49
BE	FR	MONCEAU	CHOOZ	220.48	-90	-132	-115	-112	-104	-103	-164	-162	-134	-85	-74	-107
BE	NL	VAN EYCK 1	MAASBRACHT	380.27	0	0	0	0	0	0	0		0	0	0	0
BE	NL	VAN EYCK 2	MAASBRACHT	380.28	-523	-605	-505	-560	-553	-598	-605	-447	-635	-811	-964	-1036
BE	NL	ZANDVLIET	BORSSELE	380.29	-162	-634	-729	-745	-777	-784	-772	-732	-871	-897	-940	-582
BE	NL	ZANDVLIET	GEERTRUIDENBERG	380.30	76	-139	3	25	-18	-34	-52	-26	-242	-371	-425	-472
BE	LU	BELVAL	SCHIFFLANGE	220.511	73	-1	-35	-12	11	36	1	-204	-196	-212	-161	-225

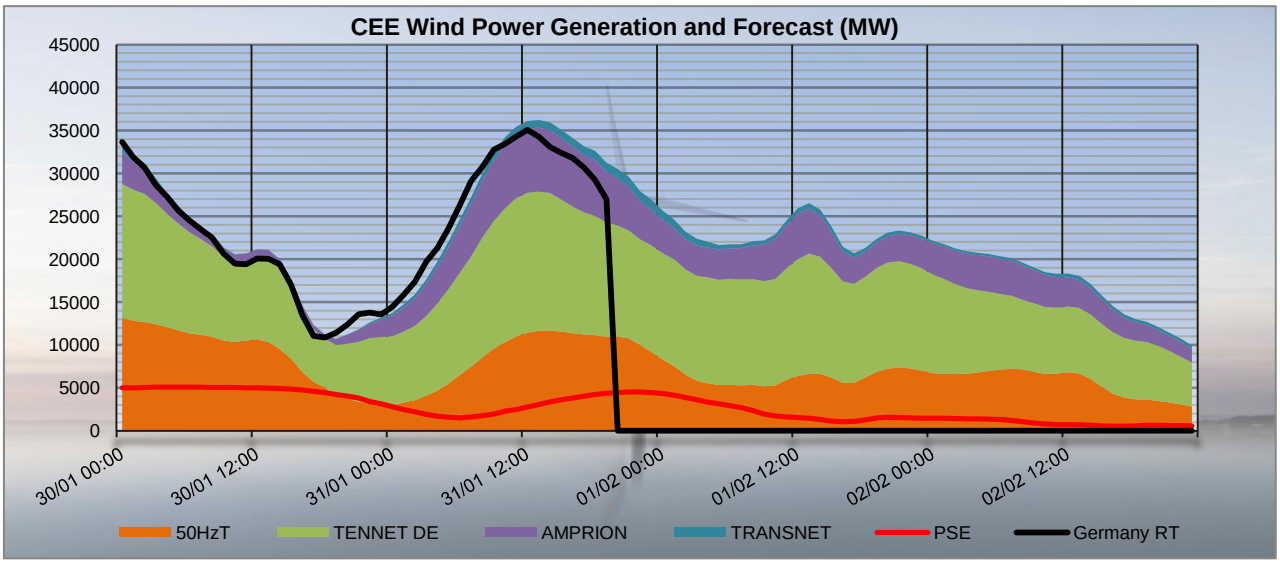
BE	FR	TOTAL		-315	22	315	191	251	148	-584	-529	399	1258	1250	788
BE	NL	TOTAL		-609	-1378	-1231	-1280	-1348	-1416	-1429	-1205	-1748	-2079	-2329	-2090
BE	LU	TOTAL		73	-1	-35	-12	11	36	1	-204	-196	-212	-161	-225
TOTAL BELGIAN IMPORT/EXPORT				-851	-1357	-951	-1101	-1086	-1232	-2012	-1938	-1545	-1033	-1240	-1527

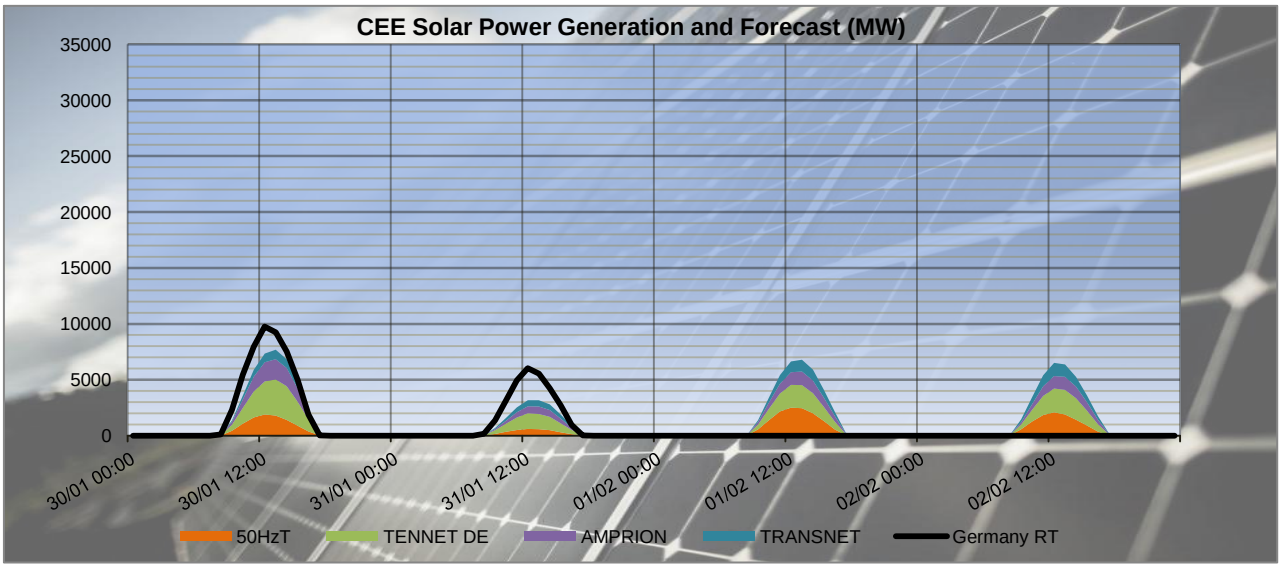
PST taps in DACF	**Zandvliet 1**	12	12	12	12	12	12	12	10	10	10	10	10
	Zandvliet 2	12	12	12	12	12	12	12	10	10	10	10	10
	Van Eyck 1												
	Van Eyck 2	15	15	15	15	15	15	15	12	12	12	12	12
	Average	13	13	13	13	13	13	13	11	11	11	11	11

CREOS PST in DACF	**Schifflange**	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	10	10	10	10	10	10	10	10	10
Zandvliet PST 2	**[1;35]**	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	10	10	10	10	10	10	10	10
Van Eyck PST 1	**[1;35]**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Van Eyck PST 2	**[1;35]**	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	12	12	12	12	12	12	12	12	12
Schifflange PST 1	**[1;35]**	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17

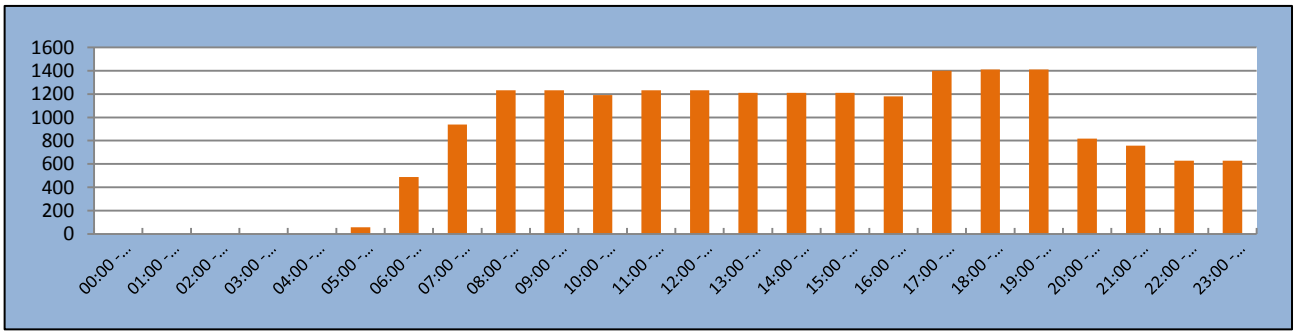
CEE Renewable Power Generation & Forecast



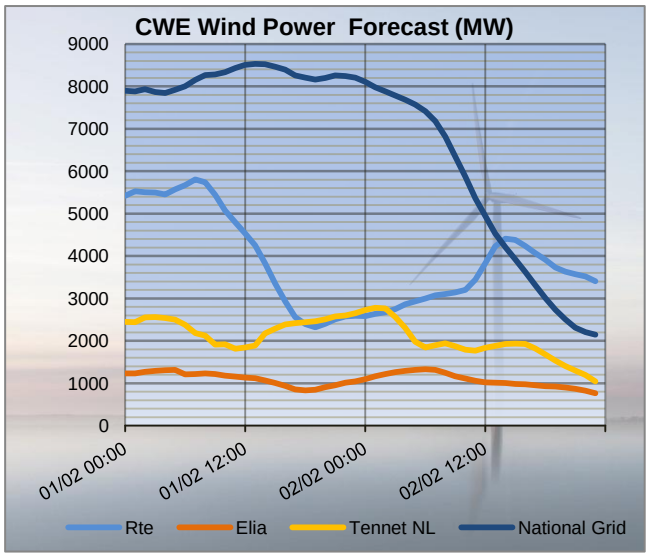


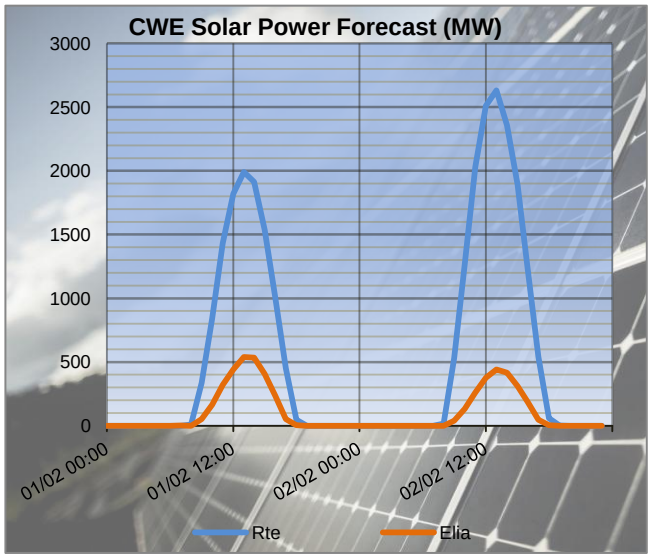
The charts above show the wind and solar generation forecasts for the TSOs in CEE (most significant) from D+1 until D-2 and the realised generation in Germany in real time. Source: Meteologica and 50HzT (RT)

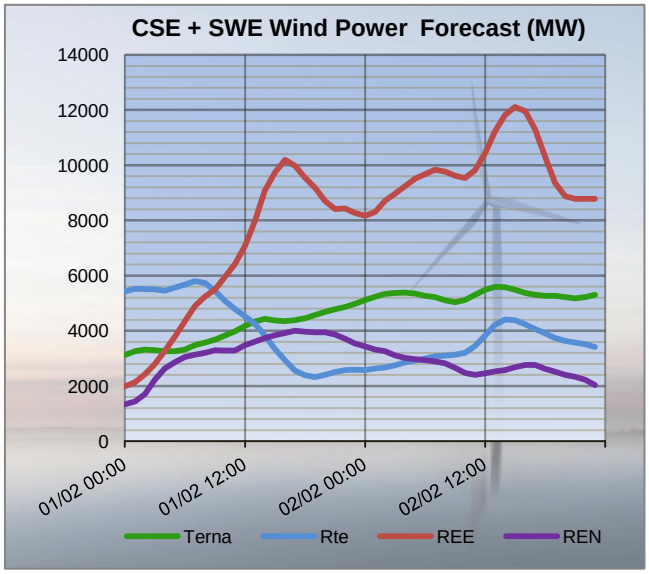
50HzT Preventive Redispatch

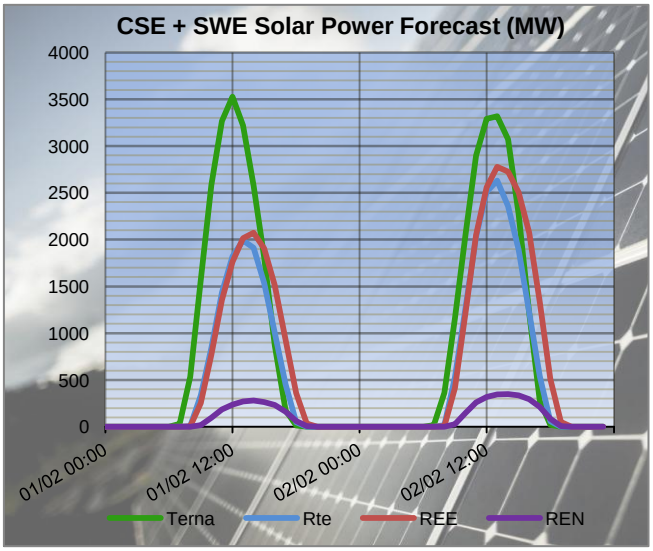


CWE, CSE & SWE Renewable Power Forecast (D-1 and D-2)









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	154	-35	-189	-45	-164	-119	-4	-148	-144	-85	-193	-108
FR	BE	MONT ST MARTIN	AUBANGE	20	7	-13	-18	-44	-26	-6	-30	-24	-14	-12	2
FR	BE	MOULAINE	AUBANGE	31	19	-12	-9	-33	-24	4	-19	-23	1	3	2
FR	BE	AVELIN	AVELGEM	479	131	-348	161	-87	-248	15	-196	-211	-22	-225	-203
FR	BE	MASTAING	AVELGEM	326	103	-223	357	174	-183	277	90	-187	259	72	-187
FR	BE	CHOOZ	MONCEAU	127	90	-37	172	132	-40	139	112	-27	137	104	-33
FR	DE	MUHLBACH	EICHSTETTEN	160	519	359	267	572	305	307	627	320	306	553	247
FR	DE	VOGELGRUN	EICHSTETTEN	17	63	46	69	94	25	102	94	-8	97	69	-28
FR	DE	ST AVOLD	ENSDORF	0	0	0	0	0	0	0	0	0	0	0	0
FR	DE	VIGY	ENSDORF 1	296	276	-20	345	260	-85	309	255	-54	246	235	-11
FR	DE	VIGY	ENSDORF 2	13	21	8	280	216	-64	242	217	-25	176	185	9

				17:30			19:30			23:30		
		Node 1	Node 2	DACF	Merge	Delta	DACF	Merge	Delta	DACF	Merge	Delta
FR	BE	LONNY	ACHENE	63	5	-58	-394	-485	-91	-220	-367	-147
FR	BE	MONT ST MARTIN	AUBANGE	2	-8	-10	-114	-125	-11	-88	-97	-9
FR	BE	MOULAINE	AUBANGE	8	-2	-10	-96	-107	-11	-71	-80	-9
FR	BE	AVELIN	AVELGEM	403	99	-304	-315	-604	-289	-85	-400	-315
FR	BE	MASTAING	AVELGEM	482	273	-209	179	-22	-201	263	49	-214
FR	BE	CHOOZ	MONCEAU	189	162	-27	111	85	-26	145	107	-38
FR	DE	MUHLBACH	EICHSTETTEN	43	479	436	-304	114	418	-296	78	374
FR	DE	VOGELGRUN	EICHSTETTEN	-10	81	91	-83	18	101	-110	-2	108
FR	DE	ST AVOLD	ENSDORF	0	0	0	0	0	0	0	0	0
FR	DE	VIGY	ENSDORF 1	276	186	-90	-205	-163	42	-416	-321	95
FR	DE	VIGY	ENSDORF 2	168	112	-56	-402	-318	84	-589	-460	129

				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	247	307	60	196	292	96	209	421	212	215	319	104
FR	CH	MAMBELIN	BASSECOURT	-73	13	86	-104	-19	85	-119	26	145	-125	-17	108
FR	CH	SIERENTZ	BASSECOURT	546	555	9	399	441	42	359	400	41	407	442	35
FR	CH	BOIS TOLLOT	ROMANEL	265	133	-132	-70	1	71	-103	24	127	142	144	2
FR	CH	SIERENTZ	LAUFENBURG	218	396	178	108	272	164	149	338	189	213	377	164
FR	CH	CORNIER	RIDDES	-42	12	54	-77	6	83	-13	37	50	11	46	35
FR	CH	CORNIER	ST TRIPHON	-72	-13	59	-82	-9	73	-20	33	53	-7	41	48
FR	CH	PRESSY	VALLORCINES	-132	-67	65	-244	-140	104	-148	-109	39	-81	-37	44
FR	CH	BOIS TOLLOT	VERBOIS	112	204	92	183	213	30	301	294	-7	222	294	72
FR	CH	GENISSIAT	VERBOIS	102	132	30	80	112	32	118	138	20	136	173	37
FR	CH	GENISSIAT	VERBOIS	102	132	30	80	112	32	118	138	20	136	173	37
FR	IT	ALBERTVILLE	RONDISSONE	685	650	-35	880	816	-64	928	739	-189	895	686	-209
FR	IT	ALBERTVILLE	RONDISSONE	732	669	-63	971	877	-94	1031	737	-294	980	772	-208
FR	IT	MENTON	CAMPOROSSO	261	205	-56	145	204	59	150	194	44	149	199	50
FR	IT	VILLARODIN	VENAUS	212	366	154	770	899	129	806	1030	224	736	909	173

				17:30			19:30			23:30		
		Node 1	Node 2	DACF	Merge	Delta	DACF	Merge	Delta	DACF	Merge	Delta
FR	CH	SIERENTZ	ASPHARD	124	251	127	-81	5	86	28	60	32
FR	CH	MAMBELIN	BASSECOURT	-146	-37	109	-333	-202	131	-264	-181	83
FR	CH	SIERENTZ	BASSECOURT	367	394	27	366	368	2	567	542	-25
FR	CH	BOIS TOLLOT	ROMANEL	-90	-47	43	-45	-240	-195	134	-4	-138
FR	CH	SIERENTZ	LAUFENBURG	78	187	109	-76	78	154	76	177	101
FR	CH	CORNIER	RIDDES	-71	13	84	-96	-38	58	-71	-27	44
FR	CH	CORNIER	ST TRIPHON	-82	4	86	-121	-41	80	-102	-52	50
FR	CH	PRESSY	VALLORCINES	-240	-140	100	-248	-180	68	-187	-128	59
FR	CH	BOIS TOLLOT	VERBOIS	210	268	58	104	239	135	118	220	102
FR	CH	GENISSIAT	VERBOIS	68	110	42	35	73	38	77	109	32
FR	CH	GENISSIAT	VERBOIS	68	110	42	35	73	38	77	109	32
FR	IT	ALBERTVILLE	RONDISSONE	913	713	-200	834	623	-211	571	364	-207
FR	IT	ALBERTVILLE	RONDISSONE	1042	734	-308	924	602	-322	632	306	-326
FR	IT	MENTON	CAMPOROSSO	145	195	50	153	192	39	148	209	61
FR	IT	VILLARODIN	VENAUS	886	1119	233	798	1003	205	428	673	245

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	34	2448	42
	Doel - Mercator (51)	2239	45	2239	56
	Doel - Mercator (52)	2239	0	2239	0
	Doel - Mercator (54)	2448	45	2448	56
	Doel - Zandvliet (25)	2349	13	2349	28
	Mercator - Horta (73)	2569	19	2569	36
	Courcelles - Gramme (31)	2343	38	2349	47
	Mercator - Rodenhuize/Horta (74)	2349	20	2349	38
RTE	Attaques - Warande 2	3780	60	3780	61
	Avelin - Gavrelle	2622	45	2622	57
	Avelin - Warande	3458	13	3458	5
	Lonny - Seuil	4149	22	4149	26
	Mandarins - Warande 1	3780	56	3780	57
	Muhlbach - Scheer	2598	33	2598	17
	Revigny - Vigy	2596	28	2596	41
	Warande - Weppes	3458	20	3458	11

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	11	2520	34
		Hagenwerder - Mikulowa (567)	2520	26	2520	17
		Hagenwerder - Mikulowa (568)	2520	25	2520	17
		Remptendorf - Redwitz (413)	3462	53	3507	61
		Remptendorf - Redwitz (414)	3462	53	3507	61
		Röhrsdorf - Hradec (445)	2520	54	2520	45
		Röhrsdorf - Hradec (446)	2520	56	2520	47
		Vieselbach - Mecklar (449-1)	2520	14	2520	36
		Wolmirstedt - Helmstedt (491-1)	2400	8	2400	13
		Wolmirstedt - Helmstedt (492-2)	2400	8	2400	13
	220 kV	Vierraden - Krajnik (507)	1352	0	1361	0
		Vierraden - Krajnik (508)	1352	0	1361	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	**2**	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	
Elia	20:30	380	Mercator	Busbar	1A	103%	380	Doel	Mercator	54	20:30
		Curative action: Decrease -2 taps on Zandvliet PSTs (10->8) -> 98% remaining									
Rte	07:30 - 13:30	380	Warrande	Mandarins	1	105%	380	Warrande	Attaques	2	08:30
		Curative action: 2 Nodes in Warrande (open coupling device 1AB & 2BC) -> 72% remaining									
Rte	All day long	380	Attaques-Warr	Mandarins	N-2	104% (5')	380/220	Attaques	TFO	2	08:30
						127% (5')	380/220	Mandarins	TFO	3	08:30
		Curative action: Trip Mandarins AT763 and both Attaques AT761/AT762 => 100% remaining on 220KV line Rumin-Holque Then 2 nodes in Holque 220KV substation => 97% remaining on Holque - Rumin									
Tennet DE Tennet NL	07:30 - 16:30	380	Dörpen West	Hanekenfähr	axis	110%	380	Diele	Meeden	1&2	11:30
		Remark: N-state overload of 131% on 380 KV line Dörpen West - Hanekenfär **Preventive action:** Decrease -3 taps on Meeden PSTs (13->13) -> 98% remaining									
Tennet NL	13:30	380	Ens	Lelystad	axis	101%	380	Ens	Lelystad	axis	13:30
		Preventive action: 2 nodes in Lelystad ==> 87% remaining									
50HzT / CEPS	13:30 - 14:30	380	Röhrsdorf	Hradec	446	114%	380	Röhrsdorf	PSTs	441	12:30
		Preventive action: Decrease -10 taps on Hradec PSTs -> 98% remaining									
50HzT	12:30 - 14:30	380	Rohrsdorf	Streumen	axis	102%	380	Rohrsdorf	Streumen	remaining	12:30
		Preventive action: Decrease -10 taps on Hradec PSTs -> 100% then, 2 node in Streumen --> 94%									

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

Tennet DE : some lines in N state overload. Maximum values detected at 11:30, 131% in Dërpen West - Hanekenfähr 380 KV line.

TSO	Validity	Contingency				Constraint					Timestamps of max
		U (kV)	Substation 1	Substation 2	Code	Overload	U (kV)	Substation 1	Substation 2	Code	
TenneT DE / Amprion	06:30 & 17:30-20:30	380	Diele	Dörpen West		116%	380	Diele	Rhede		11:30
		Preventive action : -15 taps on Diele PSTs -> 98%									

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	

50HzT DC loopflows sensitivity

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

South analyses results

Security analyses have been performed for these 2 timestamps:

- Off-peak period (23:00 – 07:00): **04:30**
- Peak period (07:00 – 23:00): **18:30**

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 : **102 MW**
- PST of Lienz adapted to **120 MW**
- PST of Camporosso adapted to **200 MW**
- PST of La Praz on **tap 1**

Peak:

- SI ➔ IT physical flow adapted to the target flow : **800 MW**
- Mendrisio-Cagno flow adapted to the schedule : **192 MW**
- PST of Lienz adapted to **120 MW**
- PST of Camporosso adapted to **200 MW**
- PST of La Praz on **tap 1**

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	45	2370	38
		Albertville - Rondissone 2	2370	46	2370	38
		Bulciago - Soazza	2300	20	2300	57
		Cagno - Mendrisio	855	22	855	39
		Musignano - Lavorgo	2270	41	2270	72
		Redipuglia - Divaca	2450	37	2450	38
		Robbia - San Fiorano	2530	29	2530	70
		Robbia - Gorlago	2530	32	2530	72
		Venaus - Villarodin	2715	24	2715	64
	220 kV	Airolo - Ponte	900	4	900	8
		Lienz - Soverzene	704	44	704	44
		Menton - Campo Rosso	1165	46	1165	44
		Padriciano - Divaca	960	42	960	39
		Riddes - Avise	1010	15	1010	31
		Riddes - Valpelline	1010	16	1010	39
		Serra - Pallanzeno	900	27	900	63

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	2016	2555	125	812
	Compensation ratio (calculated from NTC)	39%	49%	4%	8%
	Pentalateral impact on physical flows	-26%	-56%	-4%	-14%
Peak	Initial physical flows on adapted base case	2864	4699	124	1153
	Compensation ratio (calculated from NTC)	38%	50%	3%	9%
	Pentalateral impact on physical flows	-27%	-55%	-4%	-14%

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	RTE	380	Albertville	Busbar	2A	103% 1' night	220	Albertville	Longefan-Randens	
		Preventive action : Change tap position from 1 to 14 on La Praz PST-> 97% 1' night **Curative action :** Change tap position to tap 27 on La Praz PST -> 99% 20' night remaining on Longefan-Randens 220 kV								
After the preventive actions above mentioned, no more constraints 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	Swissgrid / Terna/Eles	380	Robbia	Filisur/Pradella-Sils	N-2	105%	380	Lavorgo	Musignano	
		Preventive actions : Increase SI->IT target flow from 800 MW to 1150 MW => 101% remaining on Lavorgo-Musignano 400 kV & 106% on Divaca PST AND increase taps on the 2 Rondissone PSTs (from 6 to 33 and from 9 to 33) => 97% remaining on Lavorgo-Musignano 400 kV **Curative action** : Decrease 3 taps on Divaca PST (from -3 to -6) => 95% remaining on the Divaca PST								
	Rte / Terna	380	Albertville	Rondissone	N-2	112%	380	La Praz	PST	
		Preventive actions used above : Increase SI->IT target flow from 800 MW to 1150 MW AND increase taps on the 2 Rondissone PSTs (from 6 to 33 and from 9 to 33) => 107% 20' remaining on La Praz PST **Curative action :** Change tap position on La Praz PST from 1 to 10 -> 95% 20' remaining on La Praz PST								
	APG / Terna/Eles	380/220	Redipuglia	Padriciano/Divaca	N-2	117%	220	Lienz	Soverzene	
		Preventive action used above : Increase SI->IT target flow from 800 MW to 1150 MW AND increase taps on the 2 Rondissone PSTs (from 6 to 33 and from 9 to 33) => 113% remaining on Lienz Soverzene 220 kV **Curative action :** Change tap position on Lienz PST from 12 to 9 => 96% 20' remaining								
	Terna	380	Carpi Fossoli	Caorso	N-1	112%	380	Parma	San Rocco	
		Observability area								
After the preventive actions above mentioned, no more constraints 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)	14	203
Rondissone 1 (1/33)	33	817
Rondissone 2 (1/33)	33	761
Camporosso (-32/32)	-7	221
Lienz (-32/32)	6	126
Padriciano (1/33)	14	165
Divaca (-32/32 each)	2	649

PST	Peak	
	Tap position	Physical flow to Italy (MW)
La Praz (1/33)	1	809
Rondissone 1 (1/33)	33	855
Rondissone 2 (1/33)	33	756
Camporosso (-32/32)	-4	201
Lienz (-32/32)	-20	125
Padriciano (1/33)	15	353
Divaca (-32/32 each)	-4	802

Conclusion

CWE: Topological changes in Diele PSTs and Meeden PSTs to solve constraints. N-state overload detected between TenneT DE and Amprion.
Constraint detected in Mercator - Doel area requiring low tap position in Zandvliet PSTs to solve

CEE: Several constraints detected in 50Hertz area require topological actions and redispatching to solve.

CSE : Constraints detected on CH-IT border require an increase of the SI-IT target flow from 800 to 1150 MW and maximum tap postion on both Rondissone PSTs for peak hour.
Other constraints are manageable with classical remedial actions.