

<p><u>CORESΟ Engineers</u></p> <p><u>North :</u> SCHÜLKE Arnaud</p> <p><u>South :</u> KROMLIDIS Stylianos</p>	<p>Day Ahead report for</p> <p>22 January 2018</p>
<p>Security Levels:</p> <p>CWE: One constraint detected on FR-BE border manageable with classical remedial actions.</p> <p>CEE: No critical constraint detected.</p> <p>CSE: Critical constraints detected that require topological and preventive remedial actions.</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]	11000	11:00		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]	73500	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]	46500	18:00		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]	46698	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

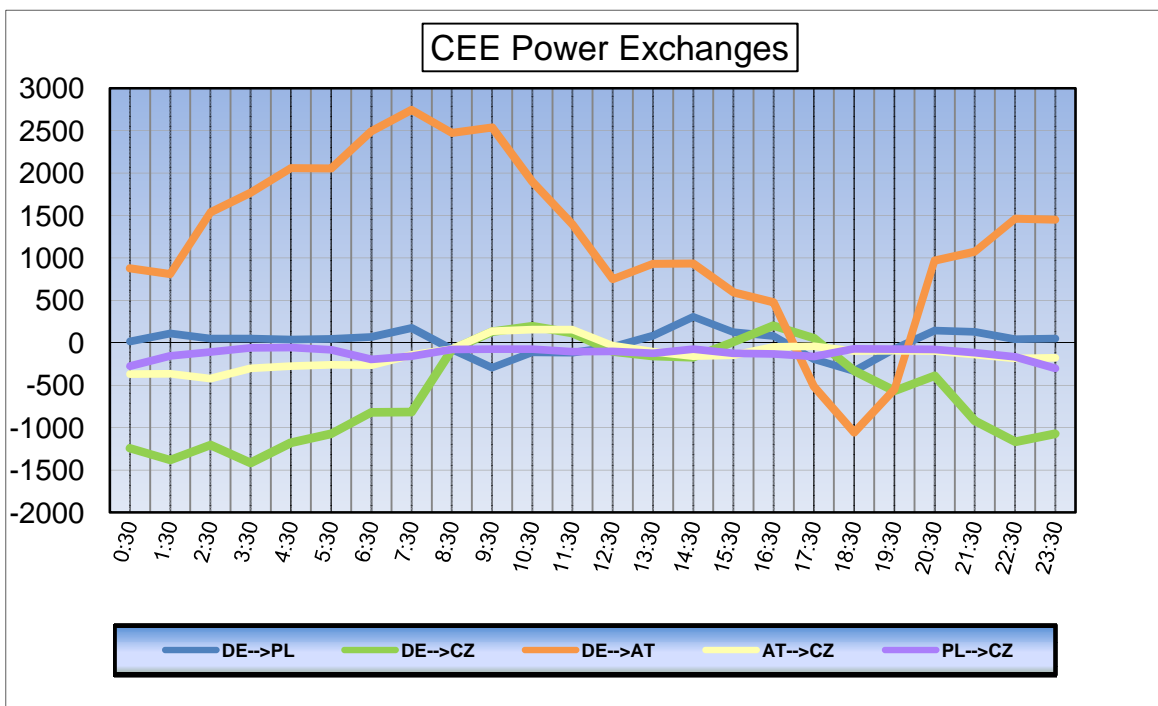
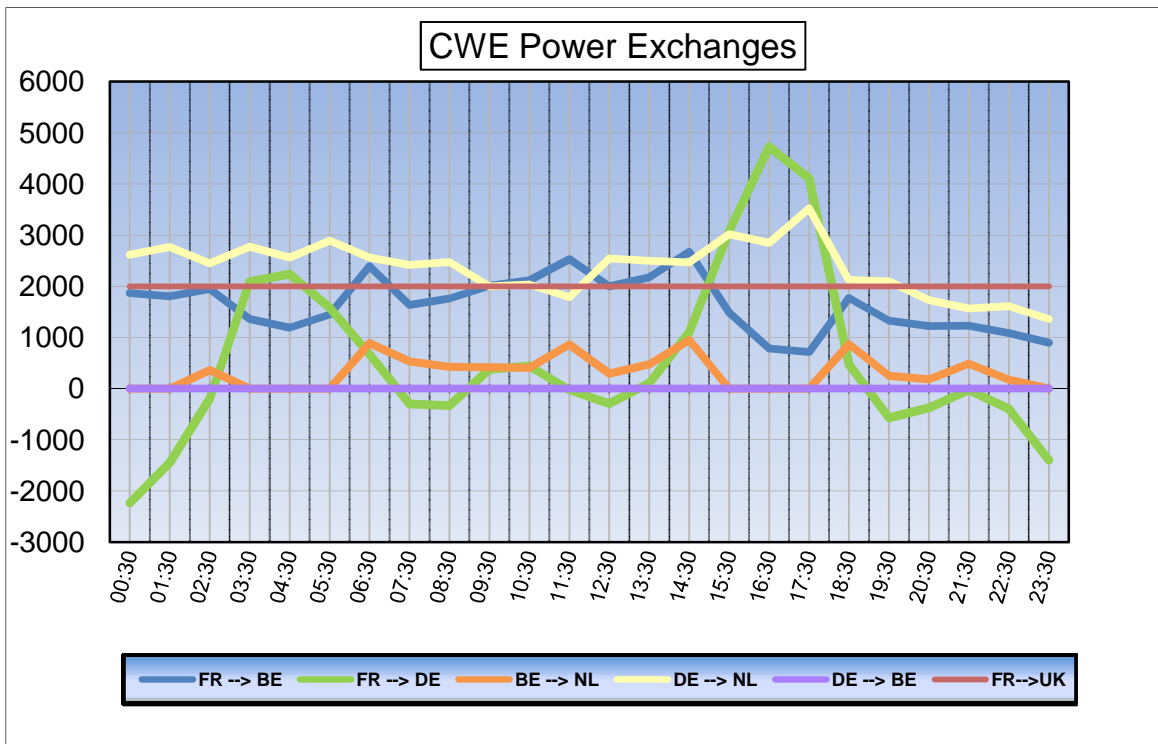
CSE N-2 applied due to storm in the South of France from 17:00 to 24:00.
Albertville-Rondissone 1 is in forced outage and is expected to be back at noon.

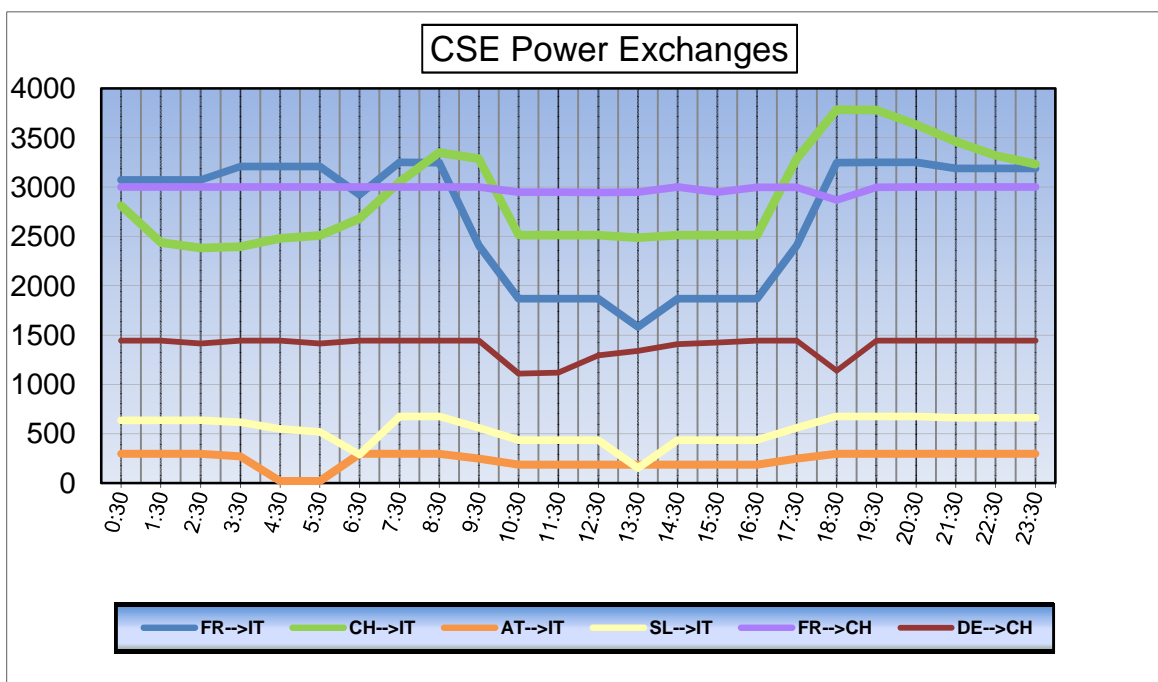
Outages table

OUTAGES						
Owner	Type of element	Line name	start	end	Comments	
50HzT	Fossil.Gen	BOXBERG _ Unit Q 400 kV	22/01/2018	25/01/2018	277 MW (reduced)	
50HzT	Fossil.Gen	JANSCHWALDE _ Unit A 400 kV	22/01/2018	23/01/2018	52 MW (reduced)	
50HzT	Fossil.Gen	JANSCHWALDE _ Unit E 400 kV	20/01/2018	22/01/2018	250 MW (reduced)	
50HzT	Hydro.Gen	GOLDISTHAL _ Unit A 400 kV	22/01/2018	26/01/2018	265 MW	
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	GUSTROW _ PUTLITZ 514 400 kV	22/01/2018	23/01/2018		
50HzT	Line	HAGENWERDER _ SCHMÖLLN 554 400 kV	22/01/2018	28/01/2018		
50HzT	Line	LUBMIN _ WIKINGER 281 220 kV	26/09/2017	31/01/2018		
50HzT	Line	RAGOW _ WUSTERMARK 521 400 kV	22/01/2018	28/01/2018		
50HzT / CEPS	Line	HRADEC VYCHOD _ ROHRSDORF 445 400 kV	22/01/2018	23/01/2018	daily	
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	
50HzT / TEN DE	Line	DOLLERN _ HAMBURG Süd 982 400 kV	22/01/2018	22/01/2018		
AMP / TEN DE	Line	NEHDEN _ TWISTETAL W 400 kV	08/01/2018	23/02/2018	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	
APG	Line	ST PETER _ Salzburg 455 220 kV	22/01/2018	26/01/2018	ALTERNATING WITH 456	
APG	Line	ST PETER _ Salzburg 456 220 kV	22/01/2018	26/01/2018	ALTERNATING WITH 455	
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		
ELES	Line	BERICEVO _ KRSKO 2 400 kV	22/01/2018	25/01/2018		
ELES / HOPS	Line	KRSKO _ TUMBRI 1 400 kV	22/01/2018	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	BUJAKOW _ KOMOROWICE 1 220 kV	22/01/2018	22/01/2018		
PSE	Line	POLANIEC _ TARNOW 400 kV	22/01/2018	26/01/2018	daily	
PSE	Line	TUCZNAWA _ RZESZOW 400 kV	22/01/2018	26/01/2018	daily	
RTE	Line	CHESNOY _ MORBRAS 2 400 kV	22/01/2018	23/01/2018		
RTE	Line	CHEVALET _ ARGOEUVES 2 380 kV	22/01/2018	23/01/2018		
RTE	Nuc.Gen	BUGEY _ Unit 3 (900MW) 400 kV	19/01/2018	23/01/2018		
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		
RTE	Nuc.Gen	TRICASTIN _ Unit 1 (900MW) 400 kV	20/01/2018	23/01/2018		
S.GRID	Line	BICKIGEN _ METTLEN 220 kV	22/01/2018	26/01/2018	No. 2 circuit Daily	
S.GRID	Line	BICKIGEN _ METTLEN 220 kV	22/01/2018	26/01/2018	No. 1 circuit Daily	
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		

Owner	Type of element	Line name	start	end	Comments
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	BASSEECOURT _ 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	Fossil.Gen	STAUDINGER _ Unit 4 400 kV	22/01/2018	26/01/2018	577 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	JARDELUND _ AUDORF Grün 380 kV	22/01/2018	09/02/2018	daily
TENNET DE	Line	OHLENSHELEN _ LANDESBERGEN 1 380 kV	22/01/2018	23/01/2018	daily
TENNET DE	Line	PLEINTIG _ KUPPLUNG 380 kV	22/01/2018	26/01/2018	
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	daily
TENNET DE	Line	WAHLE _ KLEIN ILSEDE 3 380 kV	18/01/2018	26/01/2018	daily
TENNET DE	Line	WURGASSEN _ GROHNDE 2 400 kV	22/01/2018	02/02/2018	daily
TENNET NL	Line	BLEISWIJK _ KRIMPEN WT 400 kV	21/01/2018	26/01/2018	
TENNET NL	Line	BLEISWIJK _ KRIMPEN ZT 400 kV	20/01/2018	26/01/2018	
TENNET NL	Line	EEMSHAVEN _ OUDESCHIP WT 400 kV	22/01/2018	23/01/2018	daily
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	
TERNA / S.GRID	Line	PONTE _ AIROLO 225 kV	17/01/2018	23/01/2018	
TransnetBW	Line	METZINGEN _ WENDLINGEN gelb 400 kV	22/01/2018	26/01/2018	
TransnetBW	Line	NEUROT _ PHILIPPSBURG RT 400 kV	15/01/2018	07/02/2018	daily

Exchange program forecasts





ELIA expected flows & PSTs tap position

		Node 1	Node 2	Order	00:30	03:30	05:30	07:30	10:30	11:30	12:30	16:30	17:30	19:30	22:30	23:30
BE	FR	ACHENE	LONNY	380.19	-361	-526	-452	-156	-266	-339	-249	-368	-280	348	341	400
BE	FR	AUBANGE	MONT ST MARTIN	220.51	-128	-145	-130	-106	-166	-185	-167	-193	-160	13	14	33
BE	FR	AUBANGE	MOULAIN	220.51	-132	-144	-131	-110	-171	-193	-177	-199	-169	4	3	23
BE	FR	AVELGEM	AVELIN	380.80	-856	-1100	-1192	-638	-732	-815	-651	-964	-923	118	16	68
BE	FR	AVELGEM	MASTAING	380.79	-467	-534	-589	-447	-543	-561	-443	-552	-562	-102	-120	-88
BE	FR	MONCEAU	CHOOZ	220.48	-175	-175	-172	-200	-223	-232	-209	-215	-225	-114	-112	-101
BE	NL	VAN EYCK 1	MAASBRACHT	380.27	-88	119	105	-530	-536	-462	-468	-288	-309	-715	-748	-694
BE	NL	VAN EYCK 2	MAASBRACHT	380.28	393	633	734	-160	-95	38	18	303	414	-381	-532	-458
BE	NL	ZANDVLIET	BORSSELE	380.29	-25	171	163	-464	-519	-442	-456	-328	-292	-704	-725	-796
BE	NL	ZANDVLIET	GEERTRUIDENBERG	380.30	381	674	672	242	401	515	467	703	705	-32	-47	-256
BE	LU	BELVAL	SCHIFFLANGE	220.511	260	203	275	154	128	171	182	249	246	34	-24	-115

BE	FR	TOTAL		-2119	-2624	-2666	-1657	-2101	-2325	-1896	-2491	-2319	267	142	335
BE	NL	TOTAL		661	1597	1674	-912	-749	-351	-439	390	518	-1832	-2052	-2204
BE	LU	TOTAL		260	203	275	154	128	171	182	249	246	34	-24	-115
TOTAL BELGIAN IMPORT/EXPORT				-1198	-824	-717	-2415	-2722	-2505	-2153	-1852	-1555	-1531	-1934	-1984

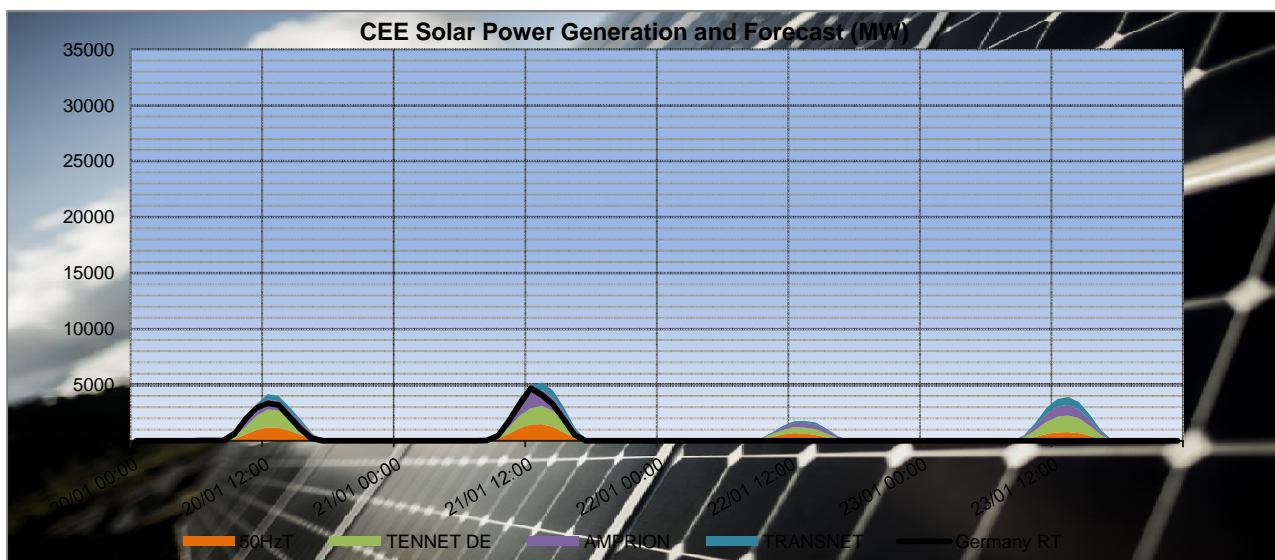
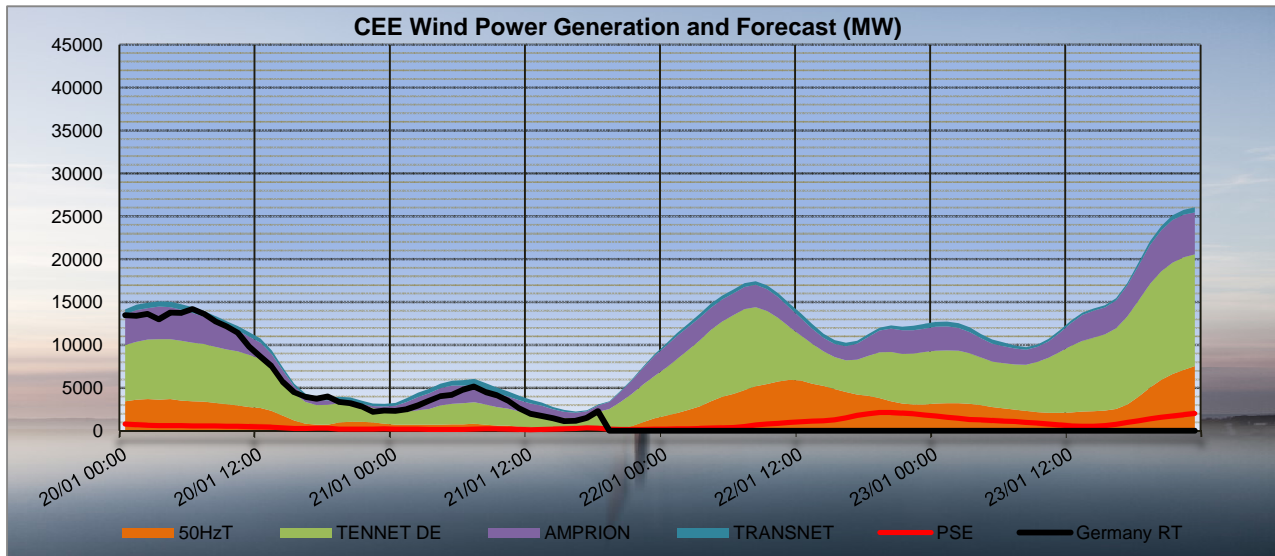
PST taps in DACF	Zandvliet 1	18	18	18	12	12	12	12	12	12	12	12	12	12	12
	Zandvliet 2	18	18	18	12	12	12	12	12	12	12	12	12	12	12
	Van Eyck 1	18	18	18	18	18	18	18	18	18	18	18	18	18	15
	Van Eyck 2	18	18	18	18	18	18	18	18	18	18	18	18	18	15
	Average	18	18	18	15	15	15	15	15	15	15	15	15	15	14

CREOS PST in DACF	Schiffange	17	21	21	17	17	17	17	17	17	17	17	17	17	17
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Proposal for real time after D-1 studies

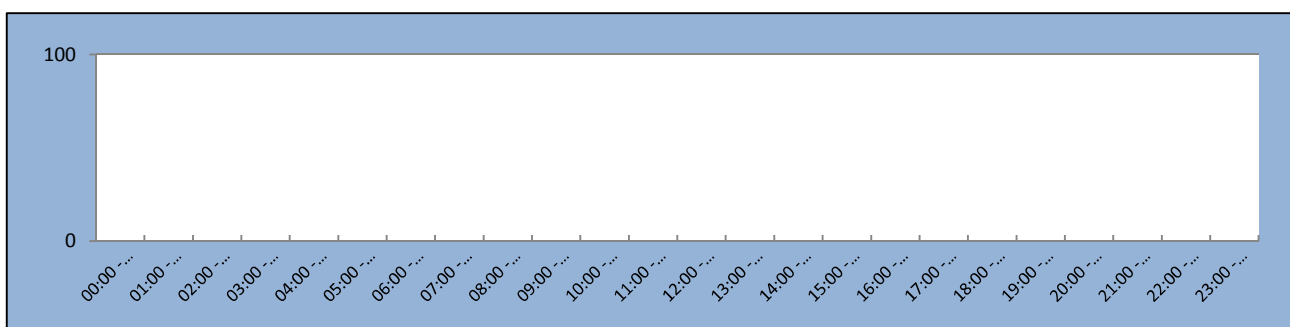
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PSTs																								
Zandvliet PST 1	[1;35]	18	18	18	18	18	18	18	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Zandvliet PST 2	[1;35]	18	18	18	18	18	18	18	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Van Eyck PST 1	[1;35]	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	15
Van Eyck PST 2	[1;35]	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	15
Schiffange PST 1	[1;35]	17	17	17	26	26	26	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17

CEE Renewable Power Generation & Forecast

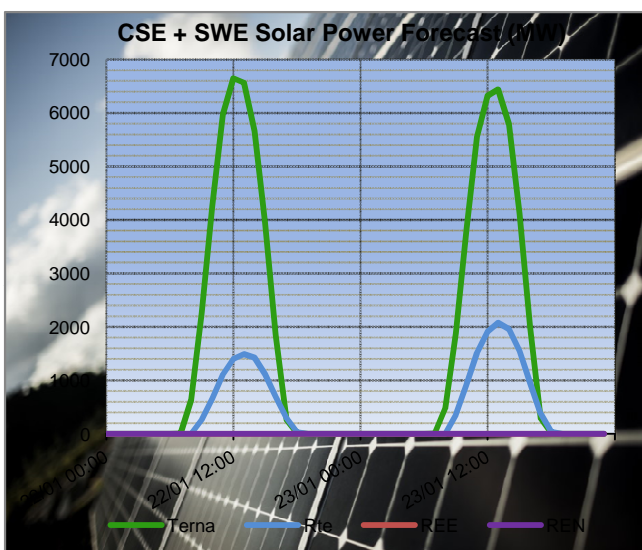
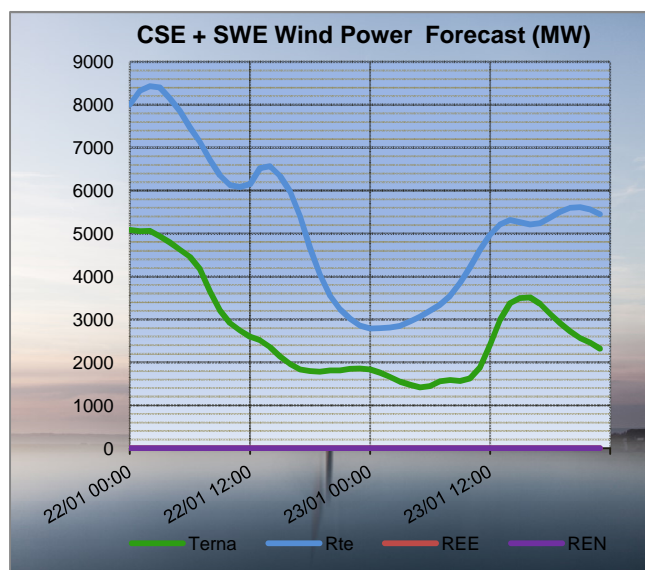
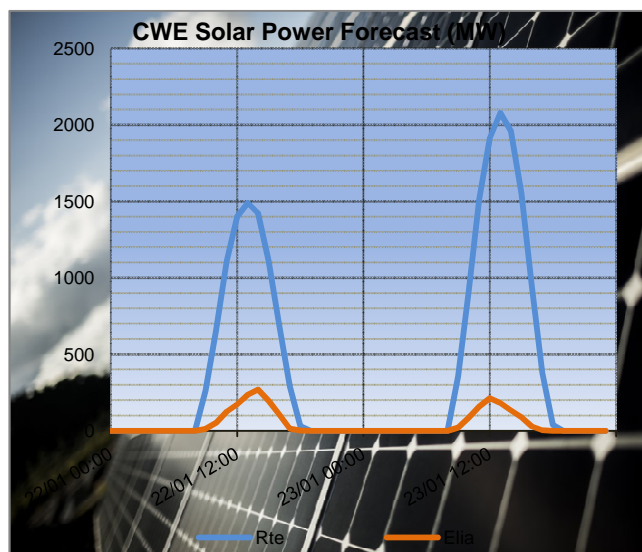
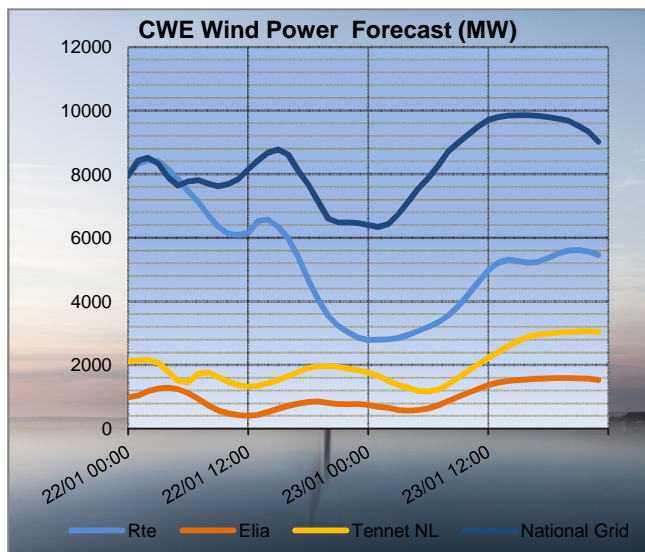


The charts above show the wind and solar generation forecasts for the TSOs in CEE (most significant) from D+1 until D-2 and the realised generation in Germany in real time. Source: Meteologia and 50HzT (RT)

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	698	526	-172	306	156	-150	482	266	-216	442	249	-193
FR	BE	MONT ST MARTIN	AUBANGE	152	145	-7	90	106	16	143	166	23	106	167	61
FR	BE	MOULAIN	AUBANGE	151	144	-7	94	110	16	149	171	22	117	177	60
FR	BE	AVELIN	AVELGEM	1168	1100	-68	604	638	34	732	732	0	556	651	95
FR	BE	MASTAING	AVELGEM	597	534	-63	437	447	10	552	543	-9	390	443	53
FR	BE	CHOOZ	MONCEAU	206	175	-31	219	200	-19	244	223	-21	227	209	-18
FR	DE	MUHLBACH	EICHSTETTEN	725	976	251	609	683	74	435	599	164	567	668	101
FR	DE	VOGELGRUN	EICHSTETTEN	180	185	5	148	139	-9	106	146	40	152	174	22
FR	DE	ST AVOLD	ENSDORF	0	0	0	0	0	0	0	0	0	0	0	0
FR	DE	VIGY	ENSDORF 1	1122	1173	51	737	651	-86	750	602	-148	847	729	-118
FR	DE	VIGY	ENSDORF 2	1051	1135	84	764	701	-63	770	633	-137	893	782	-111

				17:30			19:30			23:30		
		Node 1	Node 2	DACF	Merge	Delta	DACF	Merge	Delta	DACF	Merge	Delta
FR	BE	LONNY	ACHENE	442	280	-162	-161	-348	-187	-242	-400	-158
FR	BE	MONT ST MARTIN	AUBANGE	88	160	72	-37	-13	24	-24	-33	-9
FR	BE	MOULAIN	AUBANGE	100	169	69	-26	-4	22	-14	-23	-9
FR	BE	AVELIN	AVELGEM	673	923	250	-214	-118	96	-154	-68	86
FR	BE	MASTAING	AVELGEM	414	562	148	42	102	60	37	88	51
FR	BE	CHOOZ	MONCEAU	204	225	21	116	114	-2	122	101	-21
FR	DE	MUHLBACH	EICHSTETTEN	832	803	-29	148	277	129	-78	74	152
FR	DE	VOGELGRUN	EICHSTETTEN	231	173	-58	39	63	24	-25	23	48
FR	DE	ST AVOLD	ENSDORF	0	0	0	0	0	0	0	0	0
FR	DE	VIGY	ENSDORF 1	1128	920	-208	236	186	-50	-127	-51	76
FR	DE	VIGY	ENSDORF 2	1221	1001	-220	161	124	-37	-254	-159	95

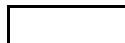
				03:30			07:30			10:30			12:30		
		Node 1	Node 2	DACF	Merge	Delta	DACF	Merge	Delta	DACF	Merge	Delta	DACF	Merge	Delta
FR	CH	SIERENTZ	ASPHARD	576	571	-5	360	550	190	332	464	132	363	417	54
FR	CH	MAMBELIN	BASSECCOURT	242	361	119	43	157	114	53	156	103	113	180	67
FR	CH	SIERENTZ	BASSECCOURT	263	286	23	254	307	53	206	271	65	229	246	17
FR	CH	BOIS TOLLLOT	ROMANEL	459	460	1	111	129	18	97	125	28	258	239	-19
FR	CH	SIERENTZ	LAUFENBURG	413	630	217	214	348	134	204	337	133	207	349	142
FR	CH	CORNIER	RIDDES	130	188	58	8	64	56	4	68	64	84	98	14
FR	CH	CORNIER	ST TRIPHON	138	185	47	23	57	34	28	72	44	106	113	7
FR	CH	PRESSY	VALLORCINES	-62	-11	51	-162	-133	29	-176	-143	33	-71	-58	13
FR	CH	BOIS TOLLLOT	VERBOIS	159	176	17	223	191	-32	252	246	-6	269	267	-2
FR	CH	GENISSIAT	VERBOIS	278	283	5	209	187	-22	212	208	-4	255	242	-13
FR	CH	GENISSIAT	VERBOIS	278	283	5	209	187	-22	212	208	-4	255	242	-13
FR	IT	ALBERTVILLE	RONDISSONE	1011	812	-199	1021	979	-42	1070	1017	-53	1011	942	-69
FR	IT	ALBERTVILLE	RONDISSONE	1122	728	-394	1093	1004	-89	1190	1110	-80	1094	996	-98
FR	IT	MENTON	CAMPOROSSO	251	196	-55	158	193	35	151	207	56	157	195	38
FR	IT	VILLARODIN	VENAUS	759	1025	266	931	1001	70	991	1091	100	902	997	95

				17:30			19:30			23:30		
		Node 1	Node 2	DACF	Merge	Delta	DACF	Merge	Delta	DACF	Merge	Delta
FR	CH	SIERENTZ	ASPHARD	430	557	127	222	356	134	219	152	-67
FR	CH	MAMBELIN	BASSECCOURT	165	250	85	-141	-39	102	-219	-172	47
FR	CH	SIERENTZ	BASSECCOURT	158	228	70	306	331	25	416	410	-6
FR	CH	BOIS TOLLLOT	ROMANEL	100	145	45	177	55	-122	163	141	-22
FR	CH	SIERENTZ	LAUFENBURG	201	355	154	125	204	79	165	259	94
FR	CH	CORNIER	RIDDES	32	74	42	8	13	5	-16	17	33
FR	CH	CORNIER	ST TRIPHON	51	85	34	-8	8	16	-51	-18	33
FR	CH	PRESSY	VALLORCINES	-161	-126	35	-131	-149	-18	-213	-167	46
FR	CH	BOIS TOLLLOT	VERBOIS	241	228	-13	156	212	56	101	152	51
FR	CH	GENISSIAT	VERBOIS	216	212	-4	174	174	0	156	170	14
FR	CH	GENISSIAT	VERBOIS	216	212	-4	174	174	0	156	170	14
FR	IT	ALBERTVILLE	RONDISSONE	1138	1070	-68	973	870	-103	827	690	-137
FR	IT	ALBERTVILLE	RONDISSONE	1233	1133	-100	1077	950	-127	886	713	-173
FR	IT	MENTON	CAMPOROSSO	148	206	58	142	196	54	146	192	46
FR	IT	VILLARODIN	VENAUS	1026	1122	96	904	929	25	514	494	-20

N state flows at 10:30 and 19:30

The I_{max} and load values in the table below are extracted from the merged TSOs' DACF.

TSO	Line (380 kV)	10:30		19:30	
		I _{max} (A)	% of I _{max}	I _{max} (A)	% of I _{max}
ELIA	Champion - Gramme (32)	2448	43	2448	42
	Doel - Mercator (51)	2239	26	2239	36
	Doel - Mercator (52)	2239	26	2239	36
	Doel - Mercator (54)	2448	26	2448	35
	Doel - Zandvliet (25)	2349	9	2349	13
	Mercator - Horta (73)	2569	13	2569	32
	Courcelles - Gramme (31)	2277	50	2349	50
	Mercator - Rodenhuize/Horta (74)	2305	15	2349	36
RTE	Attaques - Warande 2	3780	48	3780	55
	Avelin - Gavrelle	2622	9	2622	26
	Avelin - Warande	3458	24	3458	15
	Lonny - Seuil	4149	10	4149	21
	Mandarins - Warande 1	3780	45	3780	52
	Muhlbach - Scheer	2598	24	2598	20
	Revigny - Vigy	2596	10	2596	28
	Warande - Weppes	3458	30	3458	21



X < 50 % of I_{max}

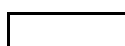


50 ≤ X < 75 % of I_{max}



X ≥ 75 % of I_{max}

TSO	Voltage	Line (380 kV)	10:30		19:30	
			I _{max} (A)	% of I _{max}	I _{max} (A)	% of I _{max}
50 HzT	380 kV	Eisenach - Mecklar (450-2)	2520	27	2520	23
		Hagenwerder - Mikulowa (567)	2520	17	2520	23
		Hagenwerder - Mikulowa (568)	2520	17	2520	23
		Remptendorf - Redwitz (413)	3572	49	3529	45
		Remptendorf - Redwitz (414)	3572	49	3529	44
		Röhrsdorf - Hradec (445)	2520	0	2520	29
		Röhrsdorf - Hradec (446)	2520	61	2520	29
		Vieselbach - Mecklar (449-1)	2520	29	2520	25
		Wolmirstedt - Helmstedt (491-1)	2400	9	2400	4
		Wolmirstedt - Helmstedt (492-2)	2400	9	2400	4
	220 kV	Vierraden - Krajnik (507)	1370	0	1370	0
		Vierraden - Krajnik (508)	1370	0	1370	0



X < 50 % of I_{max}



50 ≤ X < 75 % of I_{max}



X ≥ 75 % of I_{max}

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	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	11:30	380	Gramme	Busbar	1A	102%	380	Monceau	Transformer	12	11:30
		Curative action: The loss of generation (Tihange 1 unit connected to busbar 1A in Gramme) is compensated by generation increases in other power plants, solving the overload.									
Elia / Rte / Amprion / Creos	02:30 - 05:30	380	Vigy	Ensdorf	2	106%	220	Schiffflange	PST		05:30
		Preventive action: +2 taps (from 21 to 23) on Schiffflange PST => 88% 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 / Tennet DE	04:30	380	Diele	Meeden	axis	101%	380	Diele	Meeden	remaining	04:30
		Preventive action: -1 tap (from 17 to 16) on Meeden PSTs => 89% remaining.									
Tennet NL	08:30 - 10:30	380	Ens	Lelystad	axis	109%	380	Ens	Lelystad	remaining	09:30
		Preventive actions: 2 nodes topology in Ens (announced in the DOPT) and -2 taps on Meeden PSTs (not announced in DOPT) => 96% remaining.									
Tennet DE / Amprion	07:30	380	Dörpen West	Meppen	Weiss	113%	380	Dörpen West	Hanekenfähr	Blau	07:30
		Preventive actions: -10 taps on Diele PSTs, 2 nodes topology in Dörpen West (announced in DOPT) => 92% 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	2A	128%	150	Lillo	Zandvliet		
380	Van Eyck	Gramme	12	109%	150	Herderen	Lixhe		
				112%	150	Avernas - Landen - Brustem			
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): **04:30 (variant at 05:30)**
- 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 : **116 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 : **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	1	1
		Grande Ile	2	2
	Terna	Turbigo	1	1
		Baggio	1	1
		Bovisio	1	1
		Ostiglia	1	1

N state flows Off-Peak & Peak

The I_{max} and load values in the table below are extracted from the **adapted** merged TSOs' DACF.

TSO	Voltage	Line (380 kV)	Off Peak		Peak	
			I _{max} (A)	% of I _{max}	I _{max} (A)	% of I _{max}
Terna	380 kV	Albertville - Rondissone 1	2370	0	2370	59
		Albertville - Rondissone 2	2370	81	2370	58
		Bulciago - Soazza	2300	24	2300	38
		Cagno - Mendrisio	855	23	855	42
		Musignano - Lavorgo	2270	46	2270	53
		Redipuglia - Divaca	2450	38	2450	37
		Robbia - San Fiorano	2530	29	2530	43
		Robbia - Gorlago	2530	31	2530	51
		Venaus - Villarodin	2715	56	2715	56
	220 kV	Airolo - Ponte	900	0	900	0
		Lienz - Soverzene	704	45	704	42
		Menton - Campo Rosso	1165	42	1165	44
		Padriciano - Divaca	960	38	960	40
		Riddes - Avise	1010	34	1010	27
		Riddes - Valpelline	1010	42	1010	34
		Serra - Pallanzeno	900	44	900	55

For Terna:

<div></div>	X < 50 % of I _{max}	<div></div>	50 ≤ X < 75 % of I _{max}	<div></div>	X ≥ 75% of I _{max}
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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	2475	2823	128	792
	Compensation ratio (calculated from NTC)	41%	47%	4%	8%
	Pentalateral impact on physical flows	-21%	-60%	-4%	-15%
Peak	Initial physical flows on adapted base case	3122	3834	120	797
	Compensation ratio (calculated from NTC)	38%	49%	4%	9%
	Pentalateral impact on physical flows	-26%	-56%	-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	RTE	400	Albertville	Grande Ile	N-2	95% (1') 114 (20')	400	Albertville	Grande Ile	3
		Preventive actions: Stop pumping at Super Bissorte => 106% (20') remaining. Reduce taps at Rondissone PST (64->55) and increase at La Praz PST (1->17) => 99% remaining. Note : Thermal monitoring (Night thresholds) can also help to solve these constraints.								
	RTE	400	Albertville	Coche	1	130% (1') 102% (20')	220 400	Albertville Albertville	Longefan Rondissone	2 2
		For info: Curative action: Opening the line(s) does not cause any further constraints on 220kV grid, but Alberville-Rondissone overloads 108%. Reduce taps at Rondissone PST (64->40) => 99% remaining								

VARIANT 05:30 (max export from FR)

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	400	Albertville	Grande Ile	N-2	99% (10')	400	Albertville	Grande Ile	3
		Preventive actions: Stop pumping at Super Bissorte => 104% (20') remaining. Reduce taps at Rondissone (64->57) and La Praz (1->17) PSTs => 99% remaining. Note : Thermal monitoring (Night thresholds) can also help to solve these constraints.								
	RTE	400	Albertville	Coche	1	136% (1')	220	Albertville	Longefan	2
		For info: Curative action: Opening the line(s) does not cause any further constraints on 220kV grid, but Alberville-Rondissone overloads 110%. Reduce taps at Rondissone PST (64->38) => 99% remaining.								

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	Rte / Terna	380	Albertville	Rondissone	N-2	110% (10')	380	La Praz	PST	
		Preventive action: Increase 16 taps at La Praz PST (1 -> 17) => 96% remaining.								
	RTE	400	Albertville	Grande Ile	N-2	109% (1')	400	Albertville	Grande Ile	3
		Preventive actions: Increase taps at La Praz PST (1->17) => 125% remaining. 2N topology at Grande Ile and reduce taps at Rondissone (64->36) and => 99% remaining.								
	Swissgrid/ Terna	380	Chamoson	Romanel	N-1	134%	380/220	Chamoson	TRFO	
		For info: Preventive action: 2N topology at Bickigen and reduce generation at Chamoson => 92% 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	1024
Rondissone 1 (1/33)	30	1244
Rondissone 2 (1/33)	33	0
Camporosso (-32/32)	10	200
Lienz (-32/32)	6	130
Padriciano (1/33)	15	148
Divaca (-32/32 each)	3	645

PST	Peak	
	Tap position	Physical flow to Italy (MW)
La Praz (1/33)	1	938
Rondissone 1 (1/33)	30	918
Rondissone 2 (1/33)	31	932
Camporosso (-32/32)	4	205
Lienz (-32/32)	-16	121
Padriciano (1/33)	19	156
Divaca (-32/32 each)	-3	643

Conclusion

CWE: One constraint detected on FR-BE border manageable with classical remedial actions.

CEE: No critical constraint detected.

CSE: Critical constraints detected that require topological and preventive remedial actions.