

<p><u>CORESO Engineers</u></p> <p><u>North :</u> CARNANDET Benoit</p> <p><u>South :</u> PREVOST Raphaël</p>	<p>Day Ahead report for</p> <p>29 January 2018</p>
<p>Security Levels:</p> <p>CWE: some constraints detected (Tennet NL, Tennet DE & Amprion) require topological action and wind reduction in real time in Germany. High wind infeed in Elia grid with N state overload on 150kV grid.</p> <p>CEE: some constraints detected require topological action, cancellation of outage.</p> <p>CSE: High voltage in France close to the border with Switzerland required some actions in Switzerland. One constraint detected on a 220 kV tie-line between Switzerland and Italy manageable with topological changes on Terna side.</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]	9900	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	1900
						900	1	
				Schw. Pumpe		800	2	1600
				Lippendorf		920	2	1840
RTE			RTE	Gravelines	Pmax (MW)	900	6	5400
Peak load [MW]	74400	19:00		Chooz		1500	2	3000
				Cattenom		1300	4	5200
Generation Margin	Sufficient			Fessenheim		900	1	900
				Penly		1300	2	2600
NATIONAL GRID (UK time)				Paluel		1300	3	3900
Peak load [MW]	45000	18:00		Nogent s/ Seine		1300	2	2600
				Generation Margin		Sufficient		Bugey
				St Alban		1300	2	2600
TERNA				Cruas		900	3	2700
Peak load [MW]	46025	18:30		Tricastin		900	4	3600
						Sufficient		

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

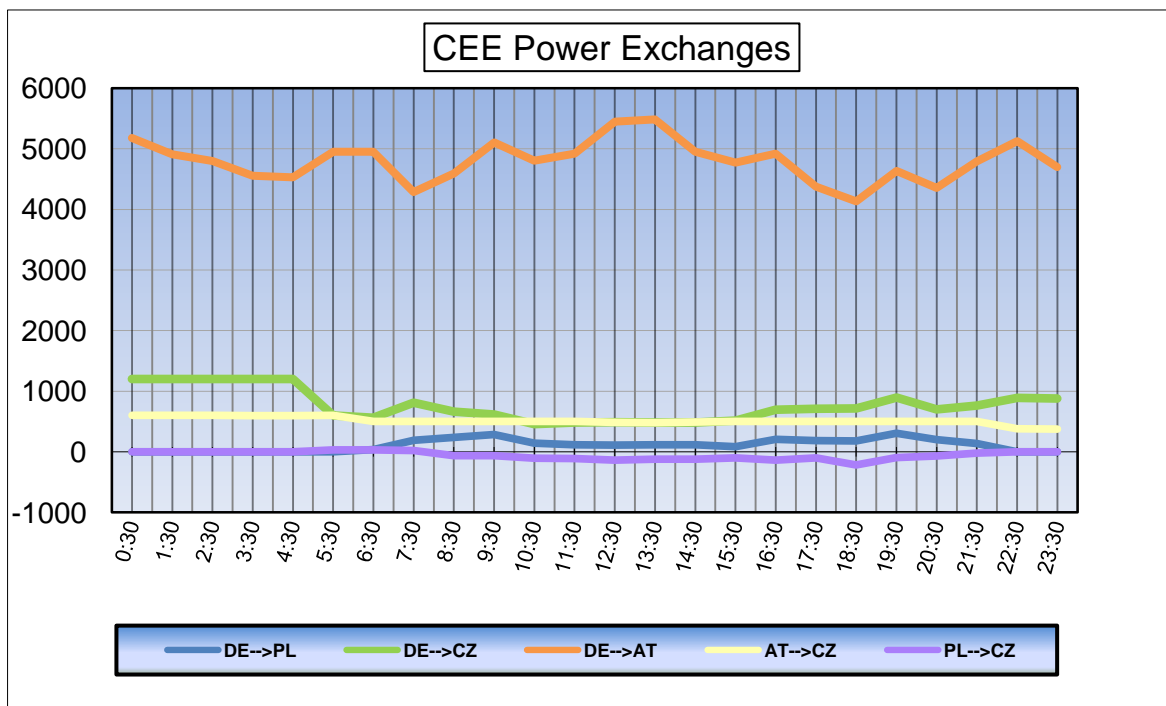
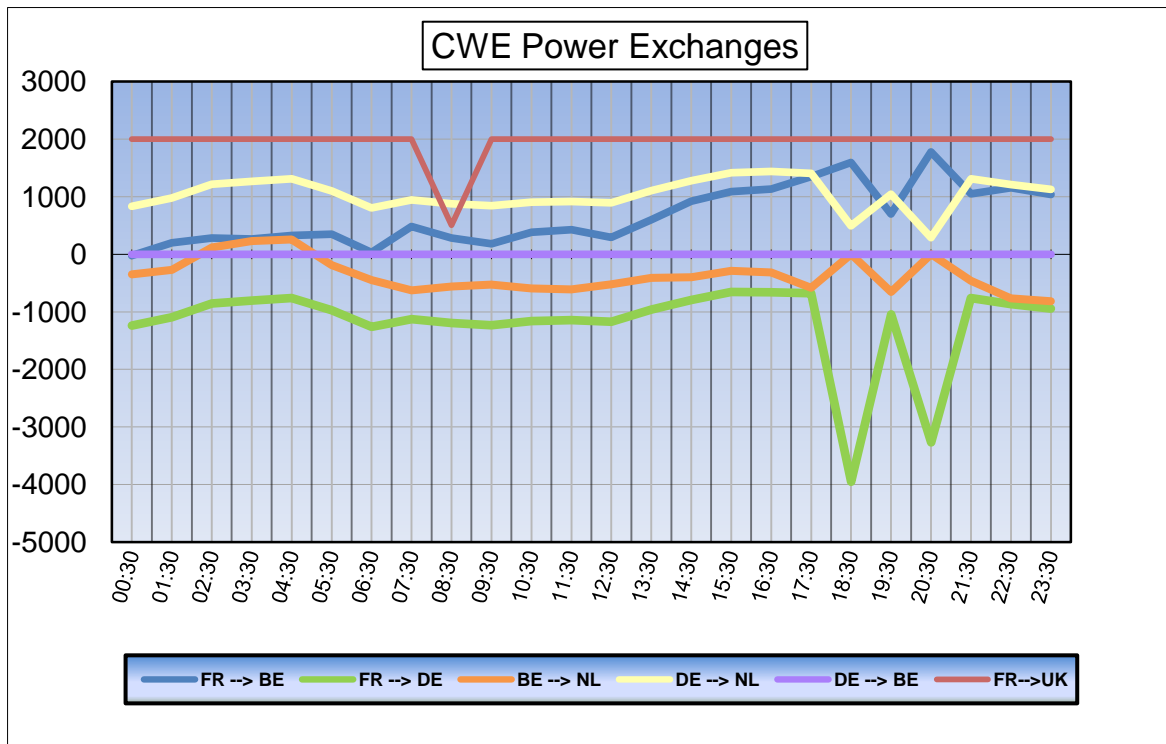
The outage of the line Bois-Tollot - Genissiat 380 kV leads to high voltage in Bois-Tollot substation. RTE asked for Swissgrid's help to decrease the voltage in this area. Swissgrid proposed to change the voltage target value on the generation units in Chamoson. According to them, it is also possible to change tap position on Verbois transformer in addition.

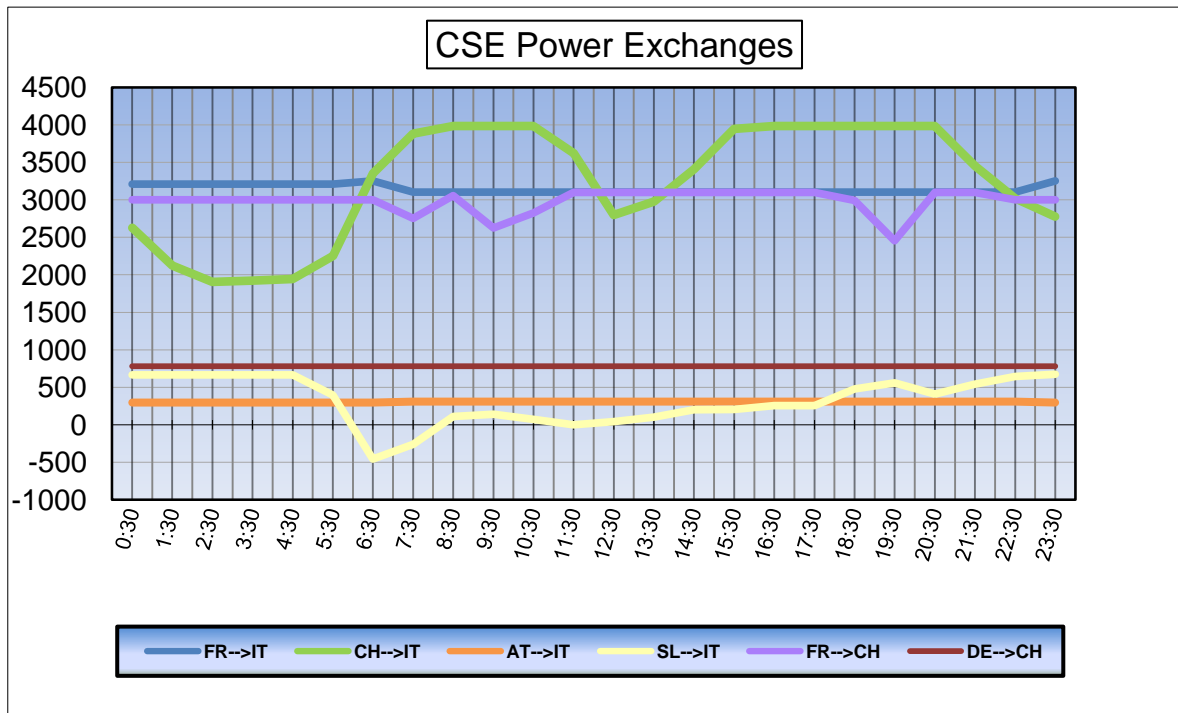
Outages table

OUTAGES						
Owner	Type of element	Line name	start	end	Comments	
50HzT	Hydro.Gen	GOLDISTHAL _ UNIT C 400 kV	27/01/2018	30/01/2018	265 MW	
50HzT	Hydro.Gen	MARKERSBACH _ UNIT C 400 kV	29/01/2018	29/01/2018	160 MW	
50HzT	Hydro.Gen	MARKERSBACH _ Unit D 400 kV	28/09/2017	27/04/2018	160 MW	
50HzT	Line	BERTIKOW _ NEUENHAGEN 303 220 kV	29/01/2018	31/01/2018		
50HzT	Line	EULA _ Wolkramhausen 357 220 kV	06/10/2017	16/03/2018		
50HzT	Line	EULA _ Wolkramhausen 357 220 kV	28/01/2018	04/02/2018		
50HzT	Line	HAGENWERDER _ SCHMÖLLN 554 400 kV	28/01/2018	04/02/2018		
50HzT	Line	HAGENWERDER _ SCHMÖLLN 554 400 kV	21/01/2018	14/02/2018		
50HzT	Line	HAMBURG Nord _ HAMBURG Ost 961 400 kV	29/01/2018	02/02/2018		
50HzT	Line	HAMBURG Nord _ HAMBURG Ost 961 400 kV	29/01/2018	23/02/2018		
50HzT	Line	HAMBURG Nord _ HAMBURG Ost 961 400 kV	29/01/2018	02/02/2018	Daily	
50HzT	Line	HAMBURG Nord _ HAMBURG Ost 962 400 kV	29/01/2018	23/02/2018		
50HzT	Line	LUBMIN _ WIKINGER 281 220 kV	28/01/2018	04/02/2018		
50HzT	Line	RAGOW _ WUSTERMARK 521 400 kV	28/01/2018	04/02/2018		
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	
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	29/01/2018	02/02/2018		
CEPS	Line	KOCIN _ REPORYJE 1 400 kV	29/01/2018	15/02/2018		
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 / HOPS	Line	KRSKO _ TUMBRI 2 400 kV	22/01/2018	02/03/2018		
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 28 400 kV	29/01/2018	30/01/2018		
HOPS	Line	BRINJE _ KONJSKO 220 kV	29/01/2018	31/01/2018		
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	BOIS TOLLOT _ GENISSIAT 1 400 kV	29/01/2018	31/01/2018		
RTE	Line	CHEVALET _ ARGOEUVES 1 380 kV	24/01/2018	23/02/2018		
RTE	Line	CHEVALET _ ARGOEUVES 1 380 kV	24/01/2018	23/02/2018		
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	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	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	28/01/2017	31/07/2018	
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
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 _ ALGERMISSEN 2 400 kV	29/01/2018	31/01/2018	
TENNET DE	Line	JARDELUND _ AUDORF Grün 380 kV	22/01/2018	09/02/2018	daily
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	
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	
TENNET NL	Line	EINDHOVEN _ GEERTRUIDENBERG ZT 400 kV	29/01/2018	31/01/2018	
TERNA / S.GRID	Line	PONTE _ AIROLO 225 kV	18/01/2018	05/02/2018	
TERNA / S.GRID	Line	PONTE _ AIROLO 225 kV	18/01/2018	05/02/2018	
TransnetBW	Line	BUNZWANGEN _ LAICHINGEN Grün 380 kV	01/01/2018	24/02/2018	
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	02:30	03:30	07:30	10:30	11:30	12:30	17:30	18:30	19:30	21:30	23:30
BE	FR	ACHENE	LONNY	380.19	166	46	65	-18	9	-18	40	-157	219	72	-71	-51
BE	FR	AUBANGE	MONT ST MARTIN	220.51	27	6	-2	26	24	4	52	-30	82	37	-11	-47
BE	FR	AUBANGE	MOULAIN	220.51	17	-1	-11	10	11	-3	39	-42	67	22	-22	-53
BE	FR	AVELGEM	AVELIN	380.80	87	-102	-53	-79	18	-34	-10	-406	28	-36	-258	-259
BE	FR	AVELGEM	MASTAING	380.79	-40	-58	-44	-135	-90	-118	-101	-374	-208	-258	-317	-325
BE	FR	MONCEAU	CHOOZ	220.48	-83	-73	-68	-149	-138	-143	-131	-179	-130	-153	-169	-174
BE	NL	VAN EYCK 1	MAASBRACHT	380.27	-312	-180	-171	48	92	131	140	111	-271	-14	-32	-183
BE	NL	VAN EYCK 2	MAASBRACHT	380.28	15	66	86	0	0	0	0	0	0	0	0	0
BE	NL	ZANDVLIET	BORSSELE	380.29	-321	-227	-212	-704	-793	-788	-758	-770	-923	-792	-457	-516
BE	NL	ZANDVLIET	GEERTRUIDENBERG	380.30	70	294	310	1	-3	19	17	-4	-280	-131	-107	-225
BE	LU	BELVAL	SCHIFFLANGE	220.511	40	54	58	-113	-112	-87	-108	-83	-181	-102	-74	-29

BE	FR	TOTAL		174	-182	-113	-345	-166	-312	-111	-1188	58	-316	-848	-909
BE	NL	TOTAL		-548	-47	13	-655	-704	-638	-601	-663	-1474	-937	-596	-924
BE	LU	TOTAL		40	54	58	-113	-112	-87	-108	-83	-181	-102	-74	-29
TOTAL BELGIAN IMPORT/EXPORT				-334	-175	-42	-1113	-982	-1037	-820	-1934	-1597	-1355	-1518	-1862

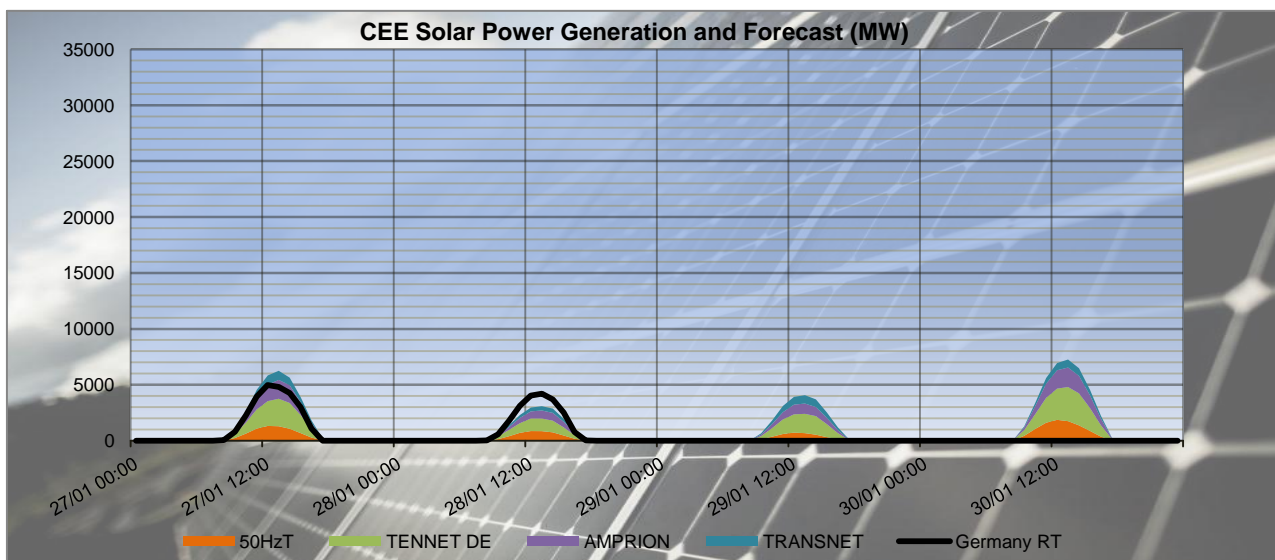
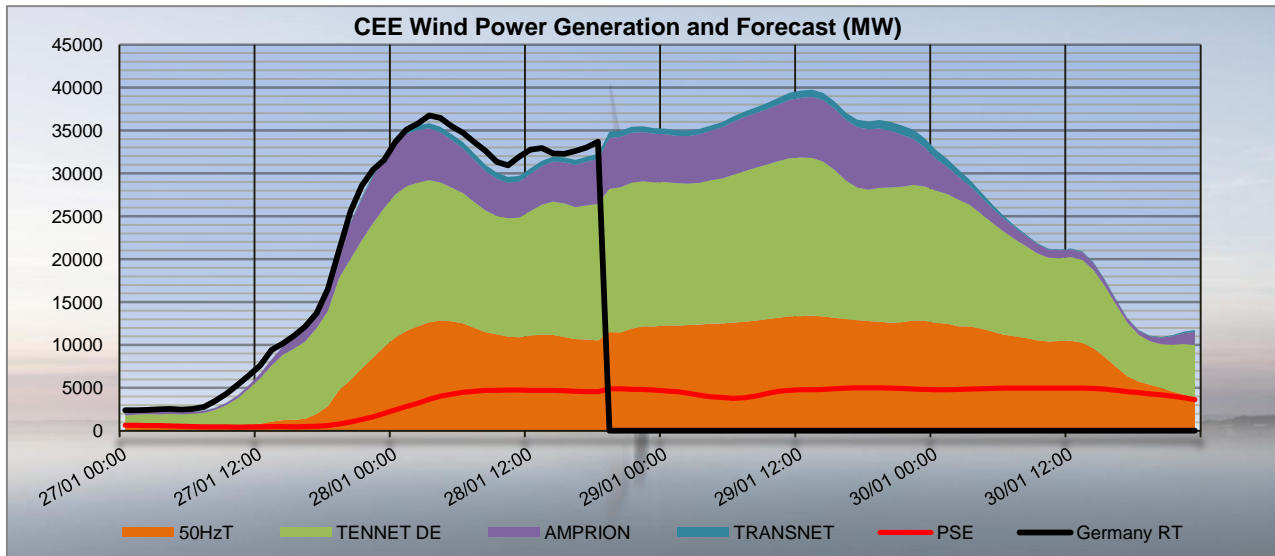
PST taps in DACF	Zandvliet 1	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	Zandvliet 2	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	Van Eyck 1	15	15	15	12	12	12	12	12	12	12	12	12	12	12
	Van Eyck 2	15	15	15	12	12	12	12	12	12	12	12	12	12	12
	Average	14	14	14	12	12	12	12	12	12	12	12	12	12	12

CREOS PST in DACF	Schiffange	17	17	17	17	17	17	17	17	15	15	15	15	17
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Proposal for real time after D-1 studies

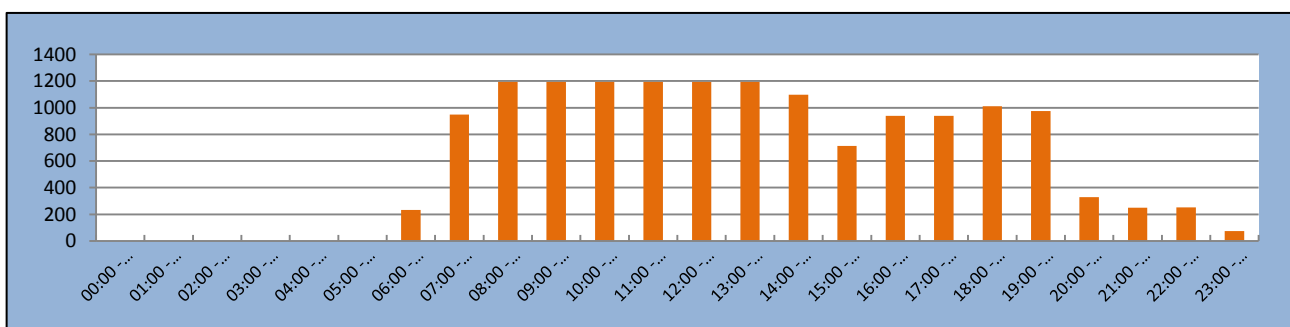
Timestamps	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
PSTs																								
Zandvliet PST 1	[1;35]	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Zandvliet PST 2	[1;35]	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Van Eyck PST 1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

CEE Renewable Power Generation & Forecast

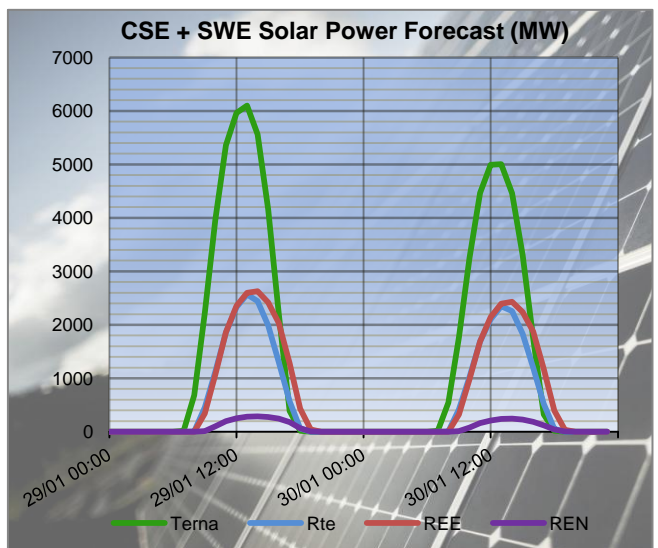
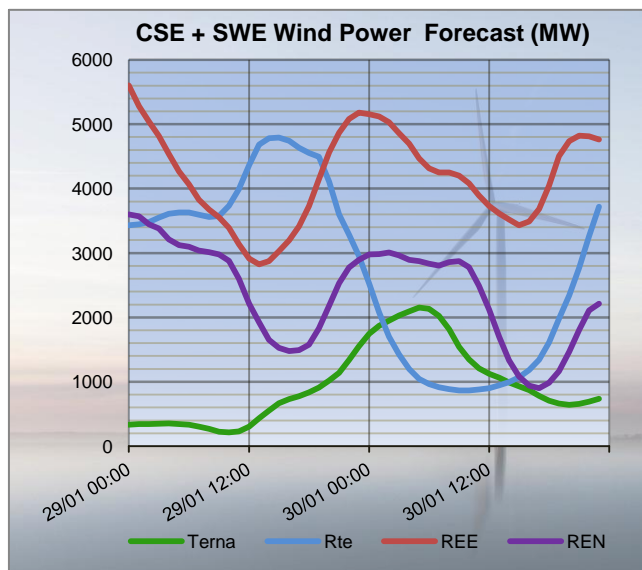
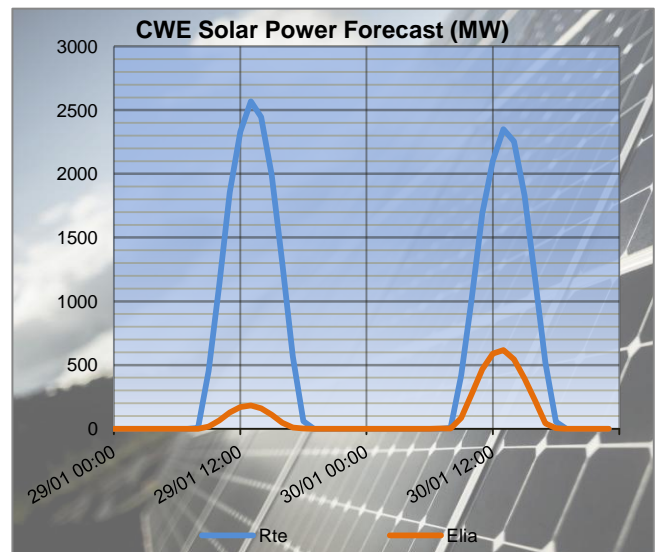
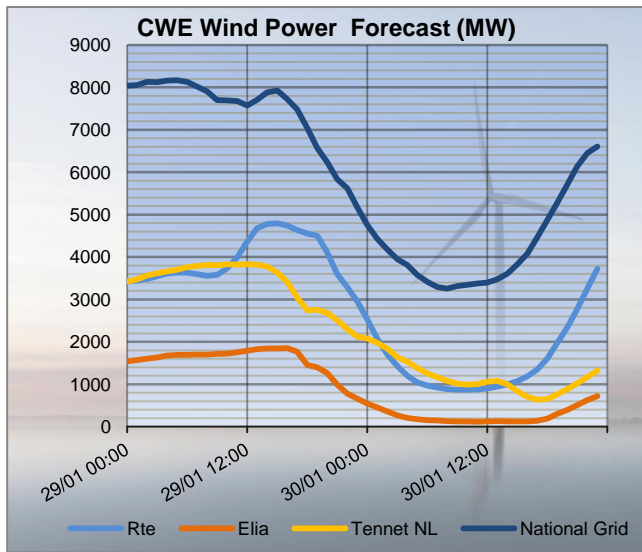


The charts above show the wind and solar generation forecasts for the TSOs in CEE (most significant) from D+1 until D-2 and the realised generation in Germany in real time. Source: Meteologica and 50HzT (RT)

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	-68	-65	3	-85	18	103	-154	-9	145	-112	-40	72
FR	BE	MONT ST MARTIN	AUBANGE	38	2	-36	13	-26	-39	6	-24	-30	2	-52	-54
FR	BE	MOULAIN	AUBANGE	44	11	-33	27	-10	-37	19	-11	-30	12	-39	-51
FR	BE	AVELIN	AVELGEM	306	53	-253	241	79	-162	140	-18	-158	100	10	-90
FR	BE	MASTAING	AVELGEM	212	44	-168	337	135	-202	296	90	-206	256	101	-155
FR	BE	CHOOZ	MONCEAU	83	68	-15	99	149	50	80	138	58	86	131	45
FR	DE	MUHLBACH	EICHSTETTEN	285	607	322	146	600	454	183	591	408	222	593	371
FR	DE	VOGELGRUN	EICHSTETTEN	13	73	60	20	103	83	7	103	96	4	89	85
FR	DE	ST AVOLD	ENSDORF	0	0	0	0	0	0	0	0	0	0	0	0
FR	DE	VIGY	ENSDORF 1	423	437	14	458	324	-134	433	299	-134	430	309	-121
FR	DE	VIGY	ENSDORF 2	164	189	25	372	275	-97	372	265	-107	380	282	-98

				17:30			19:30			23:30		
		Node 1	Node 2	DACF	Merge	Delta	DACF	Merge	Delta	DACF	Merge	Delta
FR	BE	LONNY	ACHENE	96	157	61	-62	-72	-10	65	51	-14
FR	BE	MONT ST MARTIN	AUBANGE	72	30	-42	20	-37	-57	28	47	19
FR	BE	MOULAIN	AUBANGE	81	42	-39	32	-22	-54	35	53	18
FR	BE	AVELIN	AVELGEM	546	406	-140	119	36	-83	326	259	-67
FR	BE	MASTAING	AVELGEM	485	374	-111	325	258	-67	383	325	-58
FR	BE	CHOOZ	MONCEAU	143	179	36	115	153	38	185	174	-11
FR	DE	MUHLBACH	EICHSTETTEN	235	740	505	110	580	470	267	466	199
FR	DE	VOGELGRUN	EICHSTETTEN	29	134	105	9	107	98	61	81	20
FR	DE	ST AVOLD	ENSDORF	0	0	0	0	0	0	0	0	0
FR	DE	VIGY	ENSDORF 1	537	395	-142	396	250	-146	360	302	-58
FR	DE	VIGY	ENSDORF 2	506	394	-112	338	212	-126	307	264	-43

				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	396	366	-30	205	340	135	239	301	62	289	345	56
FR	CH	MAMBELIN	BASSECCOURT	3	17	14	-140	-15	125	-135	-24	111	-78	-10	68
FR	CH	SIERENTZ	BASSECCOURT	543	485	-58	412	399	-13	395	409	14	460	455	-5
FR	CH	BOIS TOLLLOT	ROMANEL	249	202	-47	-183	-218	-35	-179	-239	-60	-221	-182	39
FR	CH	SIERENTZ	LAUFENBURG	345	469	124	105	297	192	146	300	154	193	292	99
FR	CH	CORNIER	RIDDES	12	53	41	-69	16	85	-60	19	79	-25	62	87
FR	CH	CORNIER	ST TRIPHON	-27	15	42	-77	14	91	-69	29	98	-20	72	92
FR	CH	PRESSY	VALLORCINES	-78	-33	45	-242	-106	136	-239	-106	133	-191	-3	188
FR	CH	BOIS TOLLLOT	VERBOIS	143	179	36	54	90	36	50	110	60	82	44	-38
FR	CH	GENISSIAT	VERBOIS	141	156	15	112	146	34	117	172	55	171	237	66
FR	CH	GENISSIAT	VERBOIS	141	156	15	112	146	34	117	172	55	171	237	66
FR	IT	ALBERTVILLE	RONDISSONE	767	772	5	909	788	-121	962	844	-118	891	784	-107
FR	IT	ALBERTVILLE	RONDISSONE	828	825	-3	1015	868	-147	1075	923	-152	981	845	-136
FR	IT	MENTON	CAMPOROSSO	262	-30	-292	151	-75	-226	147	-135	-282	146	-63	-209
FR	IT	VILLARODIN	VENAUS	264	512	248	775	790	15	793	889	96	692	767	75

				17:30			19:30			23:30		
		Node 1	Node 2	DACF	Merge	Delta	DACF	Merge	Delta	DACF	Merge	Delta
FR	CH	SIERENTZ	ASPHARD	299	337	38	197	244	47	294	275	-19
FR	CH	MAMBELIN	BASSECCOURT	-49	32	81	-132	-23	109	-12	59	71
FR	CH	SIERENTZ	BASSECCOURT	439	385	-54	370	346	-24	446	453	7
FR	CH	BOIS TOLLLOT	ROMANEL	-217	-250	-33	-144	-261	-117	0	-85	-85
FR	CH	SIERENTZ	LAUFENBURG	173	344	171	88	281	193	212	371	159
FR	CH	CORNIER	RIDDES	-49	14	63	-46	-1	45	44	81	37
FR	CH	CORNIER	ST TRIPHON	-45	26	71	-39	-13	26	31	66	35
FR	CH	PRESSY	VALLORCINES	-219	-119	100	-166	-145	21	-34	13	47
FR	CH	BOIS TOLLLOT	VERBOIS	80	114	34	4	122	118	-122	-37	85
FR	CH	GENISSIAT	VERBOIS	141	154	13	140	123	-17	229	238	9
FR	CH	GENISSIAT	VERBOIS	141	154	13	140	123	-17	229	238	9
FR	IT	ALBERTVILLE	RONDISSONE	952	827	-125	993	920	-73	867	886	19
FR	IT	ALBERTVILLE	RONDISSONE	1051	900	-151	1071	819	-252	954	477	-477
FR	IT	MENTON	CAMPOROSSO	149	194	45	154	209	55	159	171	12
FR	IT	VILLARODIN	VENAUS	865	831	-34	841	920	79	779	1013	234

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	32	2448	39
	Doel - Mercator (51)	2239	36	2239	38
	Doel - Mercator (52)	2239	36	2239	38
	Doel - Mercator (54)	2448	36	2448	38
	Doel - Zandvliet (25)	2349	16	2349	19
	Mercator - Horta (73)	2569	12	2569	21
	Courcelles - Gramme (31)	2267	38	2349	44
	Mercator - Rodenhuize/Horta (74)	2254	13	2349	24
RTE	Attaques - Warande 2	3780	55	3780	55
	Avelin - Gavrelle	2622	31	2622	30
	Avelin - Warande	3458	14	3458	12
	Lonny - Seuil	4149	22	4149	20
	Mandarins - Warande 1	3780	52	3780	51
	Muhlbach - Scheer	2598	30	2598	27
	Revigny - Vigy	2596	29	2596	28
	Warande - Weppes	3458	19	3458	18



X < 50 % of I_{max}

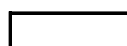


50 ≤ X < 75 % of I_{max}



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	50	2520	45
		Hagenwerder - Mikulowa (567)	2520	23	2520	35
		Hagenwerder - Mikulowa (568)	2520	23	2520	35
		Remptendorf - Redwitz (413)	3370	66	3347	65
		Remptendorf - Redwitz (414)	3370	66	3347	65
		Röhrsdorf - Hradec (445)	2520	55	2520	53
		Röhrsdorf - Hradec (446)	2520	55	2520	53
		Vieselbach - Mecklar (449-1)	2520	48	2520	43
		Wolmirstedt - Helmstedt (491-1)	2400	28	2400	36
		Wolmirstedt - Helmstedt (492-2)	2400	28	2400	36
	220 kV	Vierraden - Krajnik (507)	1290	0	1307	0
		Vierraden - Krajnik (508)	1290	0	1307	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	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	
50HzT / CEPS	6:00 - 21:00	380	Röhrsdorf	Hradec	446	114%	380	Röhrsdorf	PSTs	441	09:30
Preventive action: Decrease -5 taps on Hradec PSTs solve the constraint											
50HzT	10:00 - 16:00 & 23:30	380	Röhrsdorf	Streumen	axis	101%	380	Röhrsdorf	Streumen	remaining	23:30
Preventive action: 2 node in Streumen --> 92%, or Decrease taps on Hradec PSTs solve the constraint											
50HzT	6:00 - 24:00	380	Lauchstadt	Vieselbach	axis	118%	380	Lauchstadt	Vieselbach	remaining	10:30
Preventive action: 2 node in Vieselbach & in Lauchstadt --> 91% remaining											
50HzT	14:00 - 16:00	380	Barwalde	Graustein	axis	111%	380	Barwalde	Graustein	remaining	15:30
Preventive action: 2 node in Barwalde --> 98% 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	2:00 - 06:00	380	Diele	Meeden	axis	129%	380	Diele	Meeden	remaining	04:30
Preventive action: decrease 3 taps on Meeden => 86% remaining Note: Wind reduction in Germany (decision in Real Time) will decrease the constraint											
TenneT DE	6:00 - 16:00	380	Conneforde	Diele	axis	131%	380	Diele	PST	remaining	10:30
Preventive action: decrease 3 taps on Meeden PST=> 112% remaining then Wind reduction in Germany (decision in Real Time)											
TenneT DE	04:30 - 08:30	380	Dorpen west	Rhene	axis	122%	380	Diele	Dorpen west		
Preventive action: +9 taps on Gronau PST then wind reduction (decision in Real Time) Note: 3 nodes topology in Hanekenfahr already implemented in DACF											
TenneT DE	6:00 - 24:00	380	Sottrum	Ovenstadt		125%	380	Sottrum	Landesbergen		10:30
Preventive action: wind reduction (decision in Real Time)											
50HzT / TenneT DE	15:00 - 16:00	380	Hamburg Nord	Hamburg Ost		103%	380	Wilster	Dollern	remaining	15:30
Preventive action: Cancellation of the outage of Hamburg Nord - Hamburg Ost (961)											
TenneT DE / Amprion	All day long	380	Hanekenfahr	Dorpen West		133%	380	Dorpen West	Niederlangen		21:30
Preventive action: +9 taps on Gronau PST --> 123% then wind reduction (decision in Real Time) Note: 3 nodes topology in Hanekenfahr already implemented in DACF											

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

Note : The 150kV axis Brugges - Eeklo 5/6 in N state overload at 10:30 (110%)

Contingency				Constraint					Comments
U (kV)	Substation 1	Substation 2	Code	Overload	U (kV)	Substation 1	Substation 2	Code	
380	Horta	Eeklo 380kV	103	160%	150	Brugges - Eeklo	Langerbrugge	5/6	(0:00 -13:00) Max at 08:30 at 162%
380	Massenhoven	Busbar		111%	150	Lillo	Zandvliet	117	(7:00 -24:00) Max at 20:30 at 112%

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

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 : **103 MW**
- PST of Lienz adapted to **120 MW**
- PST of Camporosso adapted to **200 MW**
- PST of Rondissone on max. tap position
- PST of La Praz on tap 12 in preventive

Peak:

- SI → IT physical flow adapted to the target flow : **400 MW**
- Mendrisio-Cagno flow adapted to the schedule : **198 MW**
- PST of Lienz adapted to **120 MW**
- PST of Camporosso adapted to **200 MW**
- PST of Rondissone on max. tap position

Special topologies

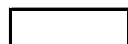
Nodes in South area				
			Off Peak	Peak
380 kV	Swissgrid	Sils	1	1
		Robbia	2	2
	Rte	Génissiat	1	1
		Albertville	2	2
		Grande Ile	1	1
	Terna	Turbigo	1	1
		Baggio	1	1
		Bovisio	2	1
		Ostiglia	1	1

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	48	2370	47
		Albertville - Rondissone 2	2370	52	2370	52
		Bulciago - Soazza	2300	29	2300	37
		Cagno - Mendrisio	855	19	855	34
		Musignano - Lavorgo	2270	49	2270	51
		Redipuglia - Divaca	2450	39	2450	20
		Robbia - San Fiorano	2530	34	2530	50
		Robbia - Gorlago	2530	40	2530	51
		Venaus - Villarodin	2715	14	2715	41
	220 kV	Airolo - Ponte	900	0	900	0
		Lienz - Soverzene	704	41	704	40
		Menton - Campo Rosso	1165	46	1165	44
		Padriciano - Divaca	960	38	960	36
		Riddes - Avise	1010	26	1010	26
		Riddes - Valpelline	1010	31	1010	28
		Serra - Pallanzeno	900	45	900	64

For Terna:



X < 50 % of I_{max}



50 ≤ X < 75 % of I_{max}



X ≥ 75 % of I_{max}

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	2156	3000	115	809
	Compensation ratio (calculated from NTC)	41%	47%	4%	8%
	Pentalateral impact on physical flows	-26%	-55%	-4%	-15%
Peak	Initial physical flows on adapted base case	2550	3882	113	483
	Compensation ratio (calculated from NTC)	38%	49%	4%	9%
	Pentalateral impact on physical flows	-27%	-55%	-4%	-15%

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		Albertville	La Coche	N-1	113% (1')	220	Albertville	Longefan	
						106%	380/220	La Praz	Transformer	
		Preventive action: Change tap position to tap 12 on La Praz PST-> 99% remaining of the 1' rating on the line and 80% remaining on the transformer. Curative action: Change tap position to tap 30 on La Praz PST -> 99% remaining on the line.								
	Rte / Terna	380	Albertville	Grande Ile	N-2	97% (1')	380	Passy	Pressy	
		Curative action: 2-node topology in Pressy and change tap position on La Praz PST to tap 27.								

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	103% (20')	380	La Praz	PST	
		Curative action: An automatic device will change tap position to tap 5 -> 98% remaining.								
	Terna/SWG	220	Rondissone	Trinot	N-2	122%	220	Sera	Pallanzeno	
		Preventive action: Terna proposed to put all the loads on the same busbar as Baggio at Magenta and leave Pallanzeno together with Novara Sud -> 91% remaining on Sera Pallanzeno.								

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)	12	243
Rondissone 1 (1/33)	33	825
Rondissone 2 (1/33)	32	755
Camporosso (-32/32)	-7	216
Lienz (-32/32)	2	119
Padriciano (1/33)	14	144
Divaca (-32/32 each)	6	676

PST	Peak	
	Tap position	Physical flow to Italy (MW)
La Praz (1/33)	1	753
Rondissone 1 (1/33)	33	830
Rondissone 2 (1/33)	32	751
Camporosso (-32/32)	-10	208
Lienz (-32/32)	-6	114
Padriciano (1/33)	17	139
Divaca (-32/32 each)	-3	345

Conclusion

CWE: some constraints detected (Tennet NL, Tennet DE & Amprion) require topological action and wind reduction in real time in Germany. High wind infeed in Elia grid with N state overload on 150kV grid.

CEE: some constraints detected require topological action, cancellation of outage.

CSE: High voltage in France close to the border with Switzerland required some actions in Switzerland. One constraint detected on a 220 kV tie-line between Switzerland and Italy manageable with topological changes on Terna side.