

<p><u>CORESO Engineers</u></p> <p><u>North :</u> KROMLIDIS Stylianos LEROY-BIASUTTI Emilie</p> <p><u>South :</u> BIVONA Ignazio HOYAL Matias</p>	<p>Day Ahead report for</p> <p>08 February 2018</p>
<p>Security Levels:</p> <p>CWE: Some constraints detected manageable with classical remedial actions.</p> <p>CEE: No critical constraint detected.</p> <p>CSE: Some constraints detected manageable with classical remedial actions. High SL>IT flows (over 1000MW) are observed in the base case and cannot be decreased any further using the PSTs.</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	3	3900
						450	2	
Peak load [MW]	11500	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]	89700	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]	47 500	18:00		Nogent s/ Seine		1300	2	2600
				Bugey		900	4	3600
Generation Margin	Sufficient			St Alban		1300	2	2600
				Cruas		900	4	3600
TERNA				Tricastin		900	3	2700
Peak load [MW]	47621	18:30						
Generation Margin	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

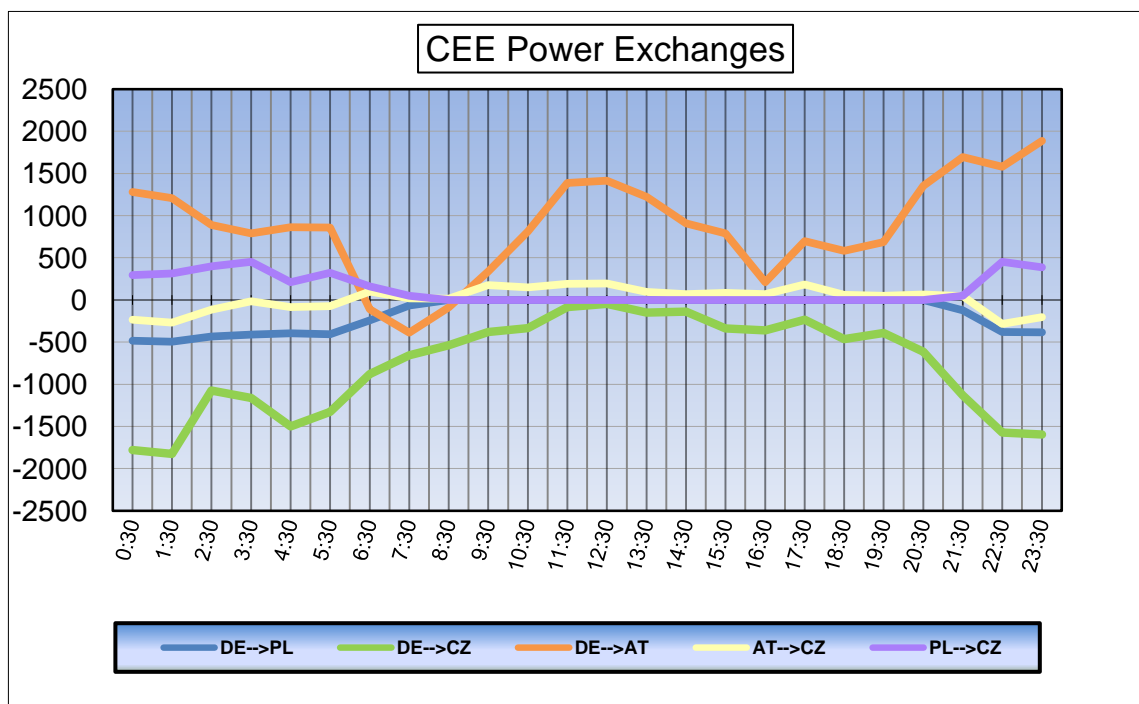
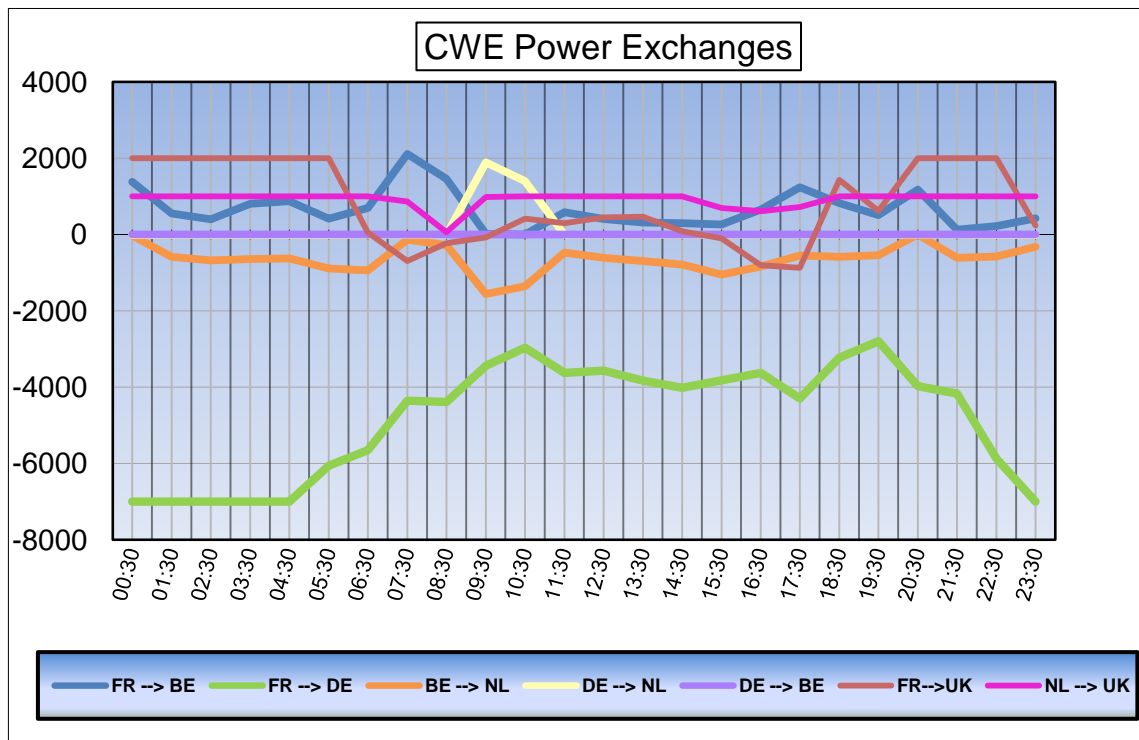
RTE: Tricastin 4 is not out but is not going to generate.

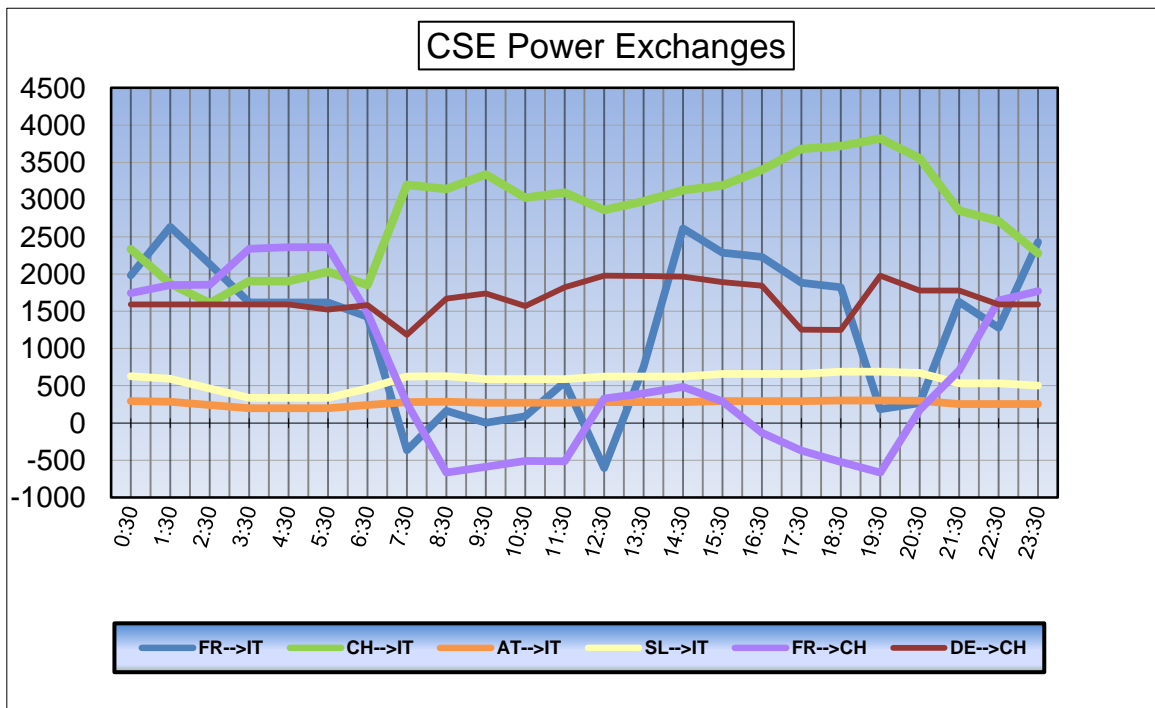
Outages table

OUTAGES						
Owner	Type of element	Line name	start	end	Comments	
50HzT	Fossil.Gen	SCHWARZE PUMP _ Unit 1 400 kV	07/02/2018	08/02/2018	755 MW	
50HzT	Hydro.Gen	MARKERSBACH _ Unit D 400 kV	28/09/2017	27/04/2018	160 MW	
50HzT	Hydro.Gen	MARKERSBACH _ Unit E 400 kV	08/02/2018	08/02/2018	160 MW	
50HzT	Line	HAGENWERDER _ SCHMÖLLN 554 400 kV	22/01/2018	09/02/2018	permanently	
50HzT	Line	HAMBURG Nord _ BRUNSBUTTEL 951 400 kV	04/02/2018	11/02/2018		
50HzT	Line	LUBMIN _ WIKINGER 281 220 kV	04/02/2018	11/02/2018		
50HzT	Line	WOLMIRSTEDT _ WUSTERMARK 494 400 kV	04/02/2018	11/02/2018		
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	
50HzT / TEN DE	Line	HELMSTEDT _ WOLMIRSTEDT 491 400 kV	05/02/2018	09/02/2018	daily	
50HzT / TEN DE	Line	HELMSTEDT _ WOLMIRSTEDT 491 400 kV	05/02/2018	09/02/2018	daily	
50HzT / TEN DE	Line	HELMSTEDT _ WOLMIRSTEDT 492 400 kV	05/02/2018	09/02/2018	daily	
APG	Line	KAINACTAL _ OBERSELACH 471 400 kV	08/02/2018	08/02/2018		
CEPS	Line	BABYLON _ BEZDECIN 451 400 kV	01/02/2018	20/02/2018	permanently	
CEPS	Line	KOCIN _ REPORYJE 1 400 kV	29/01/2018	14/02/2018	permanently	
CEPS / SEPS	Line	NOSOVIC _ VARIN 404 400 kV	15/01/2018	02/03/2018	permanently	
CREOS	Line	BERTRANGE _ SCHIFFLANGE West 220 kV	08/01/2018	02/03/2018		
ELES / HOPS	Line	KRSKO _ TUMBRI 1 400 kV	22/01/2018	02/03/2018	permanently	
ELES / HOPS	Line	KRSKO _ TUMBRI 2 400 kV	08/02/2018	11/02/2018	daily	
ELIA	Line	BRUEGEL _ COURCELLES 34 400 kV	07/02/2018	09/02/2018	permanently	
ELIA	Line	GEZELLE _ MAERLANT 109 400 kV	25/01/2018	09/02/2018	permanently	
ELIA	Line	GEZELLE _ STEVIN 111 400 kV	19/09/2017	02/03/2018	permanently	
ELIA	Line	GEZELLE _ STEVIN 112 400 kV	19/09/2017	02/03/2018	permanently	
ELIA	Line	GRAMME _ VANEYCK 12 380 kV	06/02/2018	08/02/2018	permanently	
ELIA	Line	MAERLANT _ GEZELLE 110 400 kV	25/01/2018	09/02/2018	permanently	
ELIA	Line	MAERLANT _ HORTA 104 400 kV	05/02/2018	09/02/2018	permanently	
ELIA	Nuc.Gen	DOEL _ Unit 3 (1000MW) 400 kV	23/09/2017	16/04/2018	forced outage	
PSE	Line	DOBRZEN _ TREBACZEW 400 kV	08/02/2018	09/02/2018	daily	
PSE	Line	POLANIEC _ TARNOW 400 kV	05/02/2018	10/02/2018	daily	
PSE	Line	TUCZNAWA _ RZESZOW 400 kV	05/02/2018	09/02/2018	daily	
RTE	Line	CHEVALET _ ARGOEUVES 1 380 kV	24/01/2018	23/02/2018		
RTE	Line	GENISSIAT _ VIELMOULIN 1 400 kV	29/01/2018	23/02/2018		
RTE	Line	MAZURES _ REVIN 2 400 kV	05/02/2018	09/02/2018		
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		
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		

Owner	Type of element	Line name	start	end	Comments
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	Trfo 32
TENNET DE	Fossil.Gen	WALDECK _ Unit 1 400 kV	08/02/2018	08/02/2018	30 MW
TENNET DE	Generation	KUHTAI _ Unit 1 220 kV	02/10/2017	31/01/2019	142 MW
TENNET DE	Generation	KUHTAI _ Unit 2 220 kV	01/01/2017	01/10/2019	142 MW
TENNET DE	Generation	SILZ _ 2 220 kV	01/10/2017	01/10/2019	250 MW
TENNET DE	Generation	SILZ _ Unit M1 TIWAG 220 kV	01/10/2017	31/12/2018	250 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	EICKUM _ BECHTERDISSEN 400 kV	08/02/2018	08/02/2018	
TENNET DE	Line	TWISTETAL _ BORKEN 3 400 kV	16/05/2017	11/10/2018	
TENNET NL	Fossil.Gen	EEMSCENTRAAL _ EC6 400 kV	05/02/2018	09/02/2018	359 MW
TENNET NL	Fossil.Gen	EEMSHAVEN _ UNIT 1 400 kV	05/02/2018	09/02/2018	442 MW
TENNET NL	Generation	HEMWEG _ 8 380 kV	05/02/2018	09/02/2018	650 MW
TENNET NL	Generation	MAXIMA _ UNIT FL4 400 kV	05/02/2018	09/02/2018	435 MW
TENNET NL	Generation	MD _ 1 380 kV	05/02/2018	09/02/2018	348 MW
TENNET NL	Generation	MD _ 2 380 kV	05/02/2018	09/02/2018	426 MW
TENNET NL	Line	DOEKEGAT _ OUDESCHIP ZT 400 kV	07/02/2018	08/02/2018	
TENNET NL	Line	EINDHOVEN _ GEERTRUIDENBERG ZT 400 kV	08/02/2018	08/02/2018	
TENNET NL	Line	ENS _ ZWOLLE WT 400 kV	03/02/2018	09/02/2018	
TENNET NL	Line	WATERINGEN _ BLEISWIJK Black 400 kV	04/02/2018	09/02/2018	
TENNET NL	Line	WATERINGEN _ BLEISWIJK White 400 kV	04/02/2018	09/02/2018	
TERNA	Line	SOVERZENE _ SCORZE 220 kV	08/02/2018	08/02/2018	
TERNA / S.GRID	Line	MESE _ GORDUNO 225 kV	08/02/2018	09/02/2018	
TransnetBW	Line	BUNZWANGEN _ LAICHINGEN Grün 380 kV	05/02/2018	24/02/2018	
TransnetBW	Line	DAXLANDEN _ PHILIPPSBURG GE 400 kV	05/02/2018	09/02/2018	daily
TransnetBW / TENNET NL	Line	GRAFENRHEINFELD _ HOPFINGEN 411-GE 400 kV	08/02/2018	08/02/2018	

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	15:30	17:30	19:30	21:30	23:30
BE	FR	ACHENE	LONNY	380.19	655	604	653	397	635	697	666	549	460	702	729	771
BE	FR	AUBANGE	MONT ST MARTIN	220.51	1	-3	31	-44	19	37	32	84	28	83	100	131
BE	FR	AUBANGE	MOULAIN	220.51	-6	-17	27	-62	2	15	16	66	10	65	85	112
BE	FR	AVELGEM	AVELIN	380.80	777	732	704	286	691	744	797	478	301	766	899	825
BE	FR	AVELGEM	MASTAING	380.79	73	137	119	-131	28	77	123	27	-59	82	176	183
BE	FR	MONCEAU	CHOOZ	220.48	-18	13	11	-83	-34	-16	3	-22	-48	-31	11	19
BE	NL	VAN EYCK 1	MAASBRACHT	380.27	-969	-919	-879	-851	-888	-843	-813	-719	-682	-758	-742	-788
BE	NL	VAN EYCK 2	MAASBRACHT	380.28	-539	-634	-541	-356	-365	-348	-399	-333	-492	-489	-617	-709
BE	NL	ZANDVLIET	BORSSELE	380.29	-653	-651	-775	-888	-891	-898	-910	-891	-801	-891	-736	-618
BE	NL	ZANDVLIET	GEERTRUIDENBERG	380.30	-684	-663	-601	-464	-478	-481	-473	-425	-340	-469	-502	-539
BE	LU	BELVAL	SCHIFFLANGE	220.511	-50	-56	-60	-56	-83	-45	-72	-139	-168	-109	-144	-144

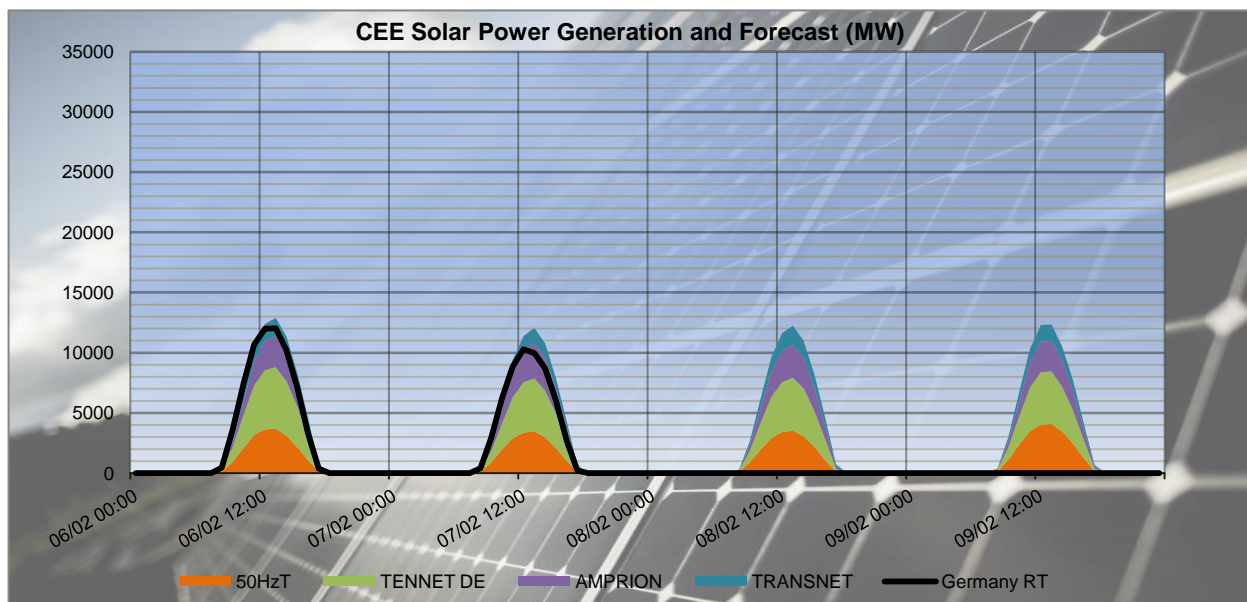
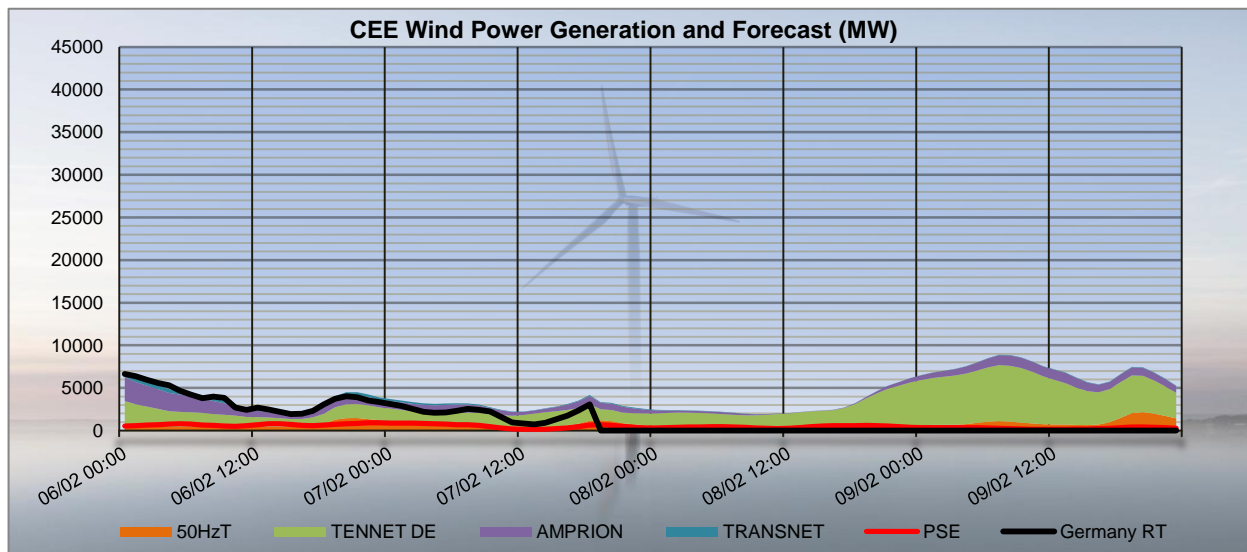
BE	FR	TOTAL		1482	1466	1545	363	1341	1554	1637	1182	692	1667	2000	2041
BE	NL	TOTAL		-2845	-2867	-2796	-2559	-2622	-2570	-2595	-2368	-2315	-2607	-2597	-2654
BE	LU	TOTAL		-50	-56	-60	-56	-83	-45	-72	-139	-168	-109	-144	-144
TOTAL BELGIAN IMPORT/EXPORT				-1413	-1457	-1311	-2252	-1364	-1061	-1030	-1325	-1791	-1049	-741	-757

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	15	15	15	15	15	15	15	15	15	15	15
	Van Eyck 2	15	15	15	15	15	15	15	15	15	15	15	15	15	15
	Average	14	14	14	14	14	14	14	14	14	14	14	14	14	14

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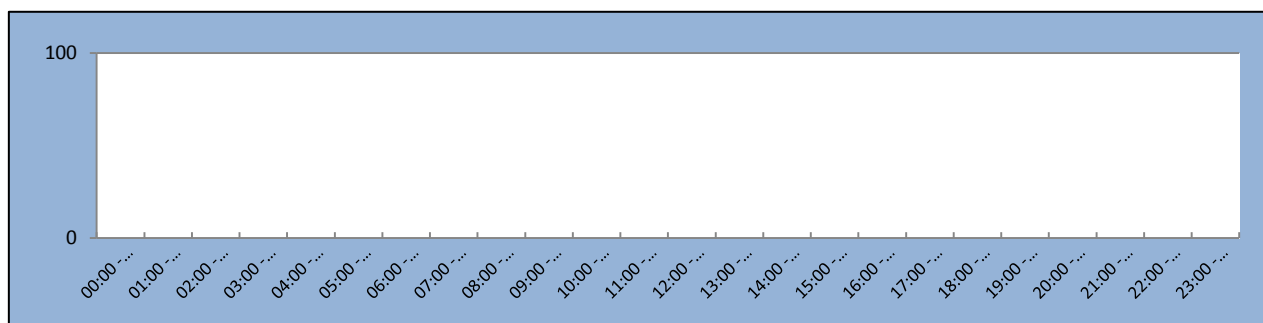
Proposal for real time after D-1 studies																								
Timestamps	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
PSTs																								
Zandvliet PST 1	[1;35]	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Zandvliet PST 2	[1;35]	12	12	12	12	12	12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

CEE Renewable Power Generation & Forecast

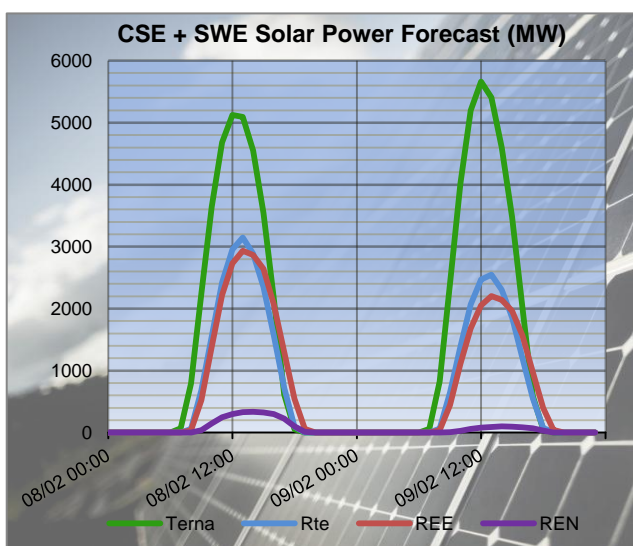
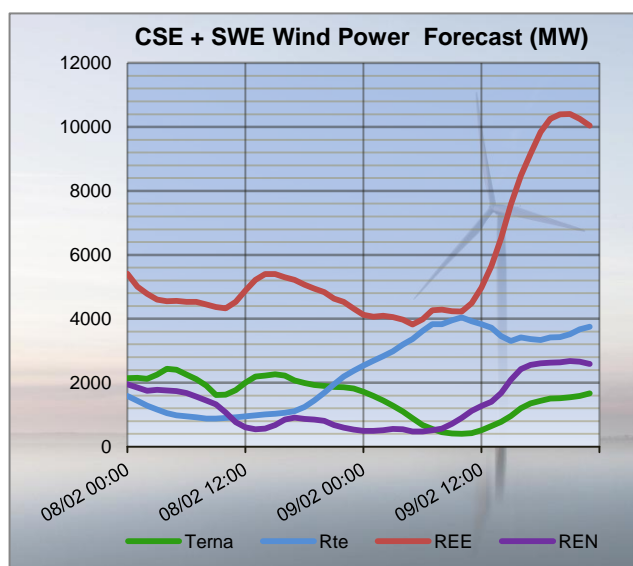
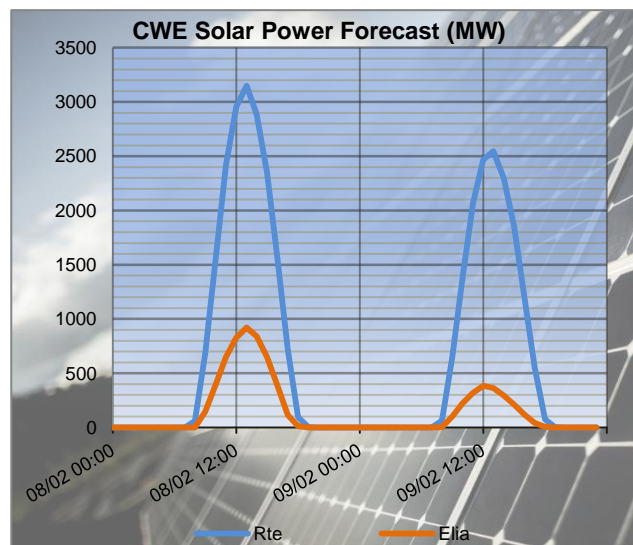
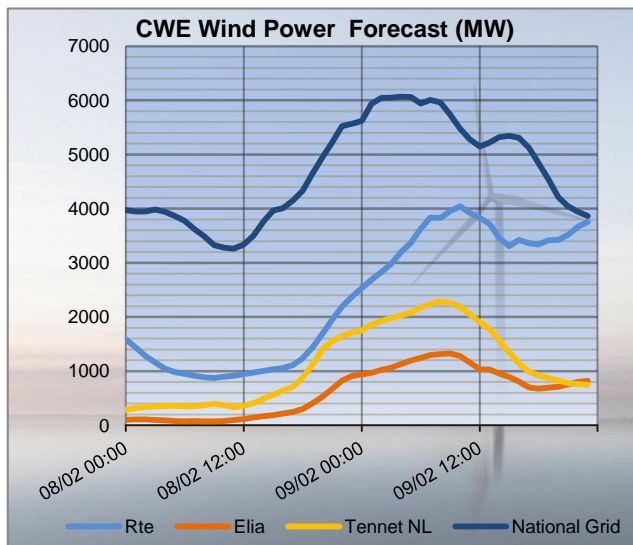


The charts above show the wind and solar generation forecasts for the TSOs in CEE (most significant) from D+1 until D-2 and the realised generation in Germany in real time. Source: Meteologica and 50HzT (RT)

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	-584	-604	-20	-355	-397	-42	-636	-635	1	-662	-666	-4
FR	BE	MONT ST MARTIN	AUBANGE	-31	3	34	10	44	34	-38	-19	19	-47	-32	15
FR	BE	MOULAIN	AUBANGE	-16	17	33	30	62	32	-19	-2	17	-30	-16	14
FR	BE	AVELIN	AVELGEM	-777	-732	45	-264	-286	-22	-620	-691	-71	-821	-797	24
FR	BE	MASTAING	AVELGEM	-144	-137	7	171	131	-40	38	-28	-66	-118	-123	-5
FR	BE	CHOOZ	MONCEAU	35	-13	-48	100	83	-17	10	34	24	-43	-3	40
FR	DE	MUHLBACH	EICHSTETTEN	-328	-157	171	-613	-280	333	-604	-354	250	-552	-284	268
FR	DE	VOGELGRUN	EICHSTETTEN	-169	-108	61	-168	-51	117	-131	-64	67	-130	-57	73
FR	DE	ST AVOLD	ENSDORF	0	0	0	0	0	0	0	0	0	0	0	0
FR	DE	VIGY	ENSDORF 1	-562	-331	231	-215	-122	93	-330	-315	15	-364	-291	73
FR	DE	VIGY	ENSDORF 2	-557	-333	224	-177	-106	71	-285	-290	-5	-329	-279	50

				17:30			19:30			23:30		
		Node 1	Node 2	DACF	Merge	Delta	DACF	Merge	Delta	DACF	Merge	Delta
FR	BE	LONNY	ACHENE	-478	-460	18	-662	-702	-40	-764	-771	-7
FR	BE	MONT ST MARTIN	AUBANGE	-41	-28	13	-45	-83	-38	-103	-131	-28
FR	BE	MOULAIN	AUBANGE	-23	-10	13	-29	-65	-36	-86	-112	-26
FR	BE	AVELIN	AVELGEM	-305	-301	4	-759	-766	-7	-807	-825	-18
FR	BE	MASTAING	AVELGEM	82	59	-23	-61	-82	-21	-155	-183	-28
FR	BE	CHOOZ	MONCEAU	19	48	29	-9	31	40	-45	-19	26
FR	DE	MUHLBACH	EICHSTETTEN	-416	-183	233	-492	-292	200	-412	-191	221
FR	DE	VOGELGRUN	EICHSTETTEN	-127	-42	85	-97	-49	48	-176	-102	74
FR	DE	ST AVOLD	ENSDORF	0	0	0	0	0	0	0	0	0
FR	DE	VIGY	ENSDORF 1	-126	-84	42	-163	-145	18	-437	-282	155
FR	DE	VIGY	ENSDORF 2	-165	-85	80	-213	-164	49	-471	-286	185

				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	67	105	38	-315	-259	56	-306	-224	82	-193	-153	40
FR	CH	MAMBELIN	BASSECOURT	-360	-313	47	-529	-425	104	-530	-445	85	-463	-387	76
FR	CH	SIERENTZ	BASSECOURT	756	659	-97	442	409	-33	414	423	9	478	433	-45
FR	CH	BOIS TOLLOT	ROMANEL	-166	-226	-60	-481	-572	-91	-475	-553	-78	-435	-559	-124
FR	CH	SIERENTZ	LAUFENBURG	52	71	19	-401	-341	60	-375	-350	25	-258	-195	63
FR	CH	CORNIER	RIDDES	-172	-116	56	-225	-175	50	-230	-182	48	-209	-164	45
FR	CH	CORNIER	ST TRIPHON	-199	-161	38	-227	-174	53	-226	-182	44	-205	-171	34
FR	CH	PRESSY	VALLORCINES	-295	-233	62	-402	-331	71	-414	-351	63	-346	-307	39
FR	CH	BOIS TOLLOT	VERBOIS	120	153	33	131	188	57	137	228	91	169	226	57
FR	CH	GENISSIAT	VERBOIS	-6	-8	-2	-29	-34	-5	-25	-9	16	-22	-21	1
FR	CH	GENISSIAT	VERBOIS	-6	-8	-2	-29	-34	-5	-25	-9	16	-22	-21	1
FR	IT	ALBERTVILLE	RONDISSONE	372	211	-161	213	-25	-238	247	172	-75	246	71	-175
FR	IT	ALBERTVILLE	RONDISSONE	375	175	-200	224	107	-117	262	156	-106	248	184	-64
FR	IT	MENTON	CAMPOROSSO	248	-157	-405	159	-98	-257	152	-141	-293	156	-131	-287
FR	IT	VILLARODIN	VENAUS	-10	-68	-58	239	256	17	246	368	122	134	228	94

				17:30			19:30			23:30		
		Node 1	Node 2	DACF	Merge	Delta	DACF	Merge	Delta	DACF	Merge	Delta
FR	CH	SIERENTZ	ASPHARD	-187	-97	90	-288	-155	133	-46	6	52
FR	CH	MAMBELIN	BASSECOURT	-508	-405	103	-520	-423	97	-452	-371	81
FR	CH	SIERENTZ	BASSECOURT	454	462	8	361	379	18	681	633	-48
FR	CH	BOIS TOLLOT	ROMANEL	-422	-578	-156	-505	-566	-61	-145	-279	-134
FR	CH	SIERENTZ	LAUFENBURG	-207	-234	-27	-361	-336	25	18	25	7
FR	CH	CORNIER	RIDDES	-225	-190	35	-219	-158	61	-174	-129	45
FR	CH	CORNIER	ST TRIPHON	-261	-207	54	-202	-148	54	-204	-164	40
FR	CH	PRESSY	VALLORCINES	-449	-387	62	-384	-302	82	-306	-249	57
FR	CH	BOIS TOLLOT	VERBOIS	99	208	109	141	222	81	97	158	61
FR	CH	GENISSIAT	VERBOIS	-52	-27	25	-44	-19	25	23	24	1
FR	CH	GENISSIAT	VERBOIS	-52	-27	25	-44	-19	25	23	24	1
FR	IT	ALBERTVILLE	RONDISSONE	443	294	-149	390	250	-140	429	216	-213
FR	IT	ALBERTVILLE	RONDISSONE	519	333	-186	436	256	-180	485	174	-311
FR	IT	MENTON	CAMPOROSSO	145	4	-141	146	23	-123	155	70	-85
FR	IT	VILLARODIN	VENAUS	351	307	-44	454	459	5	333	318	-15

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' DAF.

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	40	2448	40
	Doel - Mercator (51)	2239	58	2239	59
	Doel - Mercator (52)	2239	0	2239	0
	Doel - Mercator (54)	2448	58	2448	59
	Doel - Zandvliet (25)	2349	31	2349	31
	Mercator - Horta (73)	2569	48	2569	47
	Courcelles - Gramme (31)	2349	45	2349	45
	Mercator - Rodenhuize/Horta (74)	2349	53	2349	51
RTE	Attaques - Warande 2	3780	52	3780	54
	Avelin - Gavrelle	2622	77	2622	77
	Avelin - Warande	3458	11	3458	9
	Lonny - Seuil	4149	35	4149	35
	Mandarins - Warande 1	3540	50	3540	53
	Muhlbach - Scheer	2598	5	2598	6
	Revigny - Vigy	2596	62	2596	58
	Warande - Weppes	3458	19	3458	16

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	21	2520	15
		Hagenwerder - Mikulowa (567)	2520	21	2520	22
		Hagenwerder - Mikulowa (568)	2520	21	2520	22
		Remptendorf - Redwitz (413)	3600	34	3600	36
		Remptendorf - Redwitz (414)	3600	34	3600	36
		Röhrsdorf - Hradec (445)	2520	12	2520	14
		Röhrsdorf - Hradec (446)	2520	21	2520	23
		Vieselbach - Mecklar (449-1)	2520	25	2520	20
		Wolmirstedt - Helmstedt (491-1)	2400	0	2400	10
		Wolmirstedt - Helmstedt (492-2)	2400	5	2400	10
	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	1	1
		Vigy	2	2
	Transnet bw	Eichstetten	1	1
	Amprion	Uchtelfangen	1	1
	Tennet DE	Redwitz	1	1
	50 HzT	Remptendorf	1	1
		Wolmirstedt	1	1
	CEPS	Hradec Vychod	1	1
220 kV	50 HzT	Pasewalk	1	1

North analyses results

Security analyses have been performed for 24 timestamps.

All remedial actions have been agreed with concerned TSO during the day ahead process.

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

TSO	Validity	Contingency				Constraint					Timestamps of max
		U (kV)	Substation 1	Substation 2	Code	Overload	U (kV)	Substation 1	Substation 2	Code	
Rte	00:00 - 06:00 & 20:00 - 23:00	380	Mandarins	Warande		113%	380	Attaques	Warande		22:30
		Curative action : 2-nodes topology in Warande 380 kV (busbar couplers A and C open) => 98 % remaining.									
Elia	00:00 - 03:00	380	Horta	Mercator	73	102%	380	Mercator	Rodenhuize		01:30
		Curative action : 2-nodes topology in Horta 380 kV => 92% 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	11:00- 19:00	380	Eemshaven	Meeden	1	103%	380	Eemshaven	Meeden	2	17:30
		Preventive action : increase taps on the 2 Meeden's PST (from 17 to 23) => 99% 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	Gramme Busbar B	ATD Tibis		116%	150	Lixhe	Langerlo	228	valid from 8:00 to 12:00 max at 9:30 (116 %)
380	Avelgem	Busbar	2	118%	150	Langerbrugge	Nieuwevaart	7	valid from 7:00 to 24:00 max at 19:30 (134 %)
380	Meerhout	Busbar	1	109%	150	Lillo	Zandvliet	117	valid all day max at 8:30 (111 %)
Observability area									

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): **01:30**
- Peak period (07:00 – 23:00): **14:30**

Adaptations made on merged DACFs:

Off-peak:

- SI → IT physical flow adapted to **1250 MW** (target flow: 800MW)
- Mendrisio-Cagno flow adapted to the schedule : **110 MW**
- PST of Lienz adapted to **200 MW**
- PST of Camporosso adapted to **200 MW**
- PST of La Praz on **tap 1**

Peak:

- SI → IT physical flow adapted **1000 MW** (target flow: 800MW)
- Mendrisio-Cagno flow adapted to the schedule : **150 MW**
- PST of Lienz adapted to **185 MW**
- PST of Camporosso adapted to **200 MW**
- PST of La Praz on **tap 1**

Special topologies

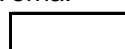
Nodes in South area				
			Off Peak	Peak
380 kV	Swissgrid	Sils	1	1
		Robbia	2	2
	Rte	Génissiat	1	1
		Albertville	2	2
		Grande Ile	1	1
	Terna	Turbigo	1	1
		Baggio	1	1
		Bovisio	2	2
		Ostiglia	1	1

N state flows Off-Peak & Peak

The 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	19	2370	29
		Albertville - Rondissone 2	2370	18	2370	32
		Bulciago - Soazza	2300	29	2300	40
		Cagno - Mendrisio	855	18	855	27
		Musignano - Lavorgo	2270	41	2270	51
		Redipuglia - Divaca	2700	52	2700	42
		Robbia - San Fiorano	2530	34	2530	47
		Robbia - Gorlago	2530	47	2530	56
		Venaus - Villarodin	2715	15	2715	28
	220 kV	Airolo - Ponte	900	16	900	4
		Lienz - Soverzene	704	71	704	64
		Menton - Campo Rosso	1165	41	1165	44
		Padriciano - Divaca	960	79	960	82
		Riddes - Avise	1010	1	1010	13
		Riddes - Valpelline	1010	2	1010	13
		Serra - Pallanzeno	900	16	900	33

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	1084	2786	196	1274
	Compensation ratio (calculated from NTC)	39%	49%	4%	8%
	Pentalateral impact on physical flows	-27%	-56%	-4%	-14%
Peak	Initial physical flows on adapted base case	1706	3601	182	1097
	Compensation ratio (calculated from NTC)	37%	50%	4%	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	APG / Eles / Terna	380/220	ATD Redipuglia - Planais		N-K	137%	220	Lienz	PST	
						145%	220	Lienz	Soverzene	
		<u>Preventive action</u> : -4 taps in Lienz PST (20 to 16) => 112% remaining for PST (119% for line)								
		<u>Curative action</u> : -4 taps in Lienz PST (16 to 12) => 90% remaining for PST (96% for line)								
After the preventive action taken above, no more 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	APG / Eles / Terna	380/220	ATD Redipuglia - Planais		N-K	124%	220	Lienz	PST	
						131%	220	Lienz	Soverzene	
		<u>Preventive action</u> : -2 taps in Lienz PST (9 to 7) => 112% remaining for PST (118% for line) <u>Curative action</u> : -4 taps in Lienz PST (7 to 3) => 92% remaining for PST (97% for line)								
After the preventive action taken above, no more constraint 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 Pentilateral reduction).

PST	Off Peak	
	Tap position	Physical flow to Italy (MW)
La Praz (1/33)	1	61
Rondissone 1 (1/33)	31	296
Rondissone 2 (1/33)	33	310
Camporosso (-32/32)	-19	194
Lienz (-32/32)	-17	125
Padriciano (1/33)	33	309
Divaca (-32/32 each)	-26	994

PST	Peak	
	Tap position	Physical flow to Italy (MW)
La Praz (1/33)	1	286
Rondissone 1 (1/33)	33	514
Rondissone 2 (1/33)	33	470
Camporosso (-32/32)	-13	207
Lienz (-32/32)	-26	151
Padriciano (1/33)	33	313
Divaca (-32/32 each)	-29	797

Conclusion

CWE: Some constraints detected manageable with classical remedial actions.

CEE: No critical constraint detected.

CSE: Some constraints detected manageable with classical remedial actions. High SL>IT flows (over 1000MW) are observed in the base case and cannot be decreased any further using the PSTs.