

<p><u>CORESO Engineers</u></p> <p><u>North :</u> ROCHET Jonathan HOYAL Matías</p> <p><u>South :</u> GOSSIAUX Alain LEROY-BIASUTTI Emilie</p>	<p>Day Ahead report for</p> <p>02 February 2018</p>
<p>Security Levels:</p> <p>CWE: Constraint detected in Mercator - Doel area requiring Zandvliet PSTs tapping in both preventive and curative to solve.</p> <p>CEE: Constraints detected in 50Hertz area require topological actions to solve.</p> <p>CSE : Constraints detected on CH-IT border require a preventive 2-nodes topology in Sils 380 kV (agreed by Swissgrid).</p> <p>Other constraints are manageable with classical 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]	10700	18:00		Tihange		1000	2	2900
							450	
Generation Margin	Sufficient			Coo		230	3	1170
							160	
			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]	78200	09:30		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]	46670	18:00		Nogent s/ Seine		1300	2	2600
				Bugey		900	4	3600
Generation Margin	Sufficient			St Alban		1300	2	2600
				Cruas		900	3	2700
TERNA				Tricastin		900	4	3600
Peak load [MW]	46516	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

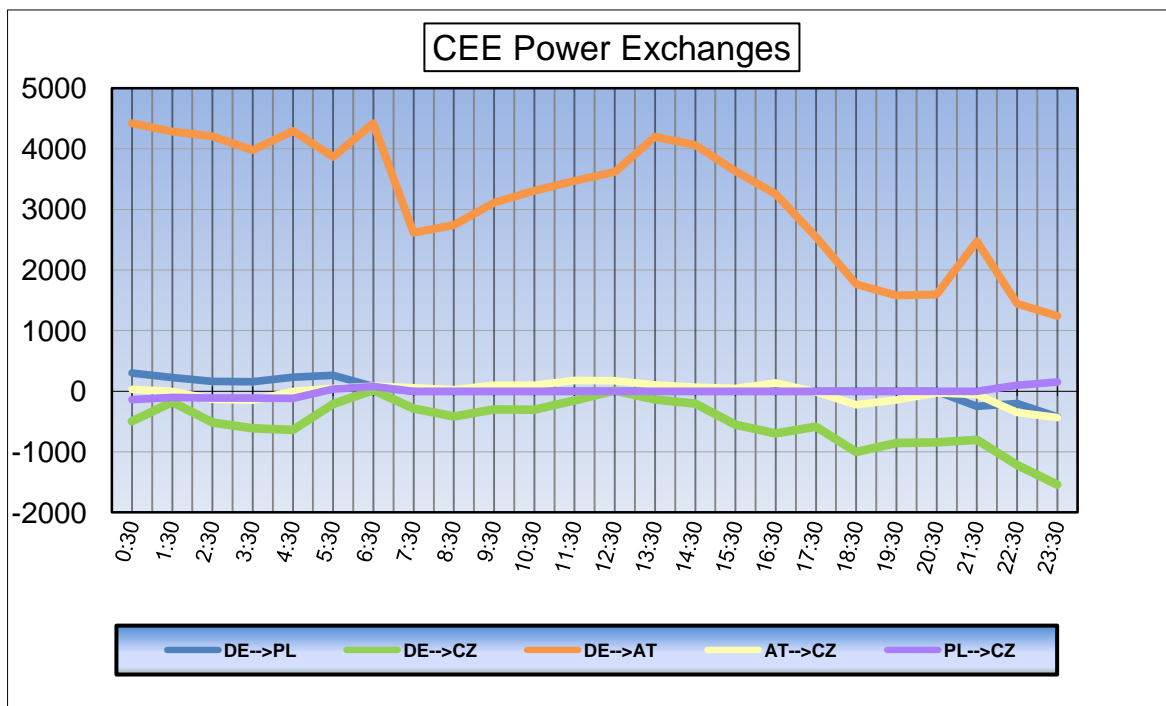
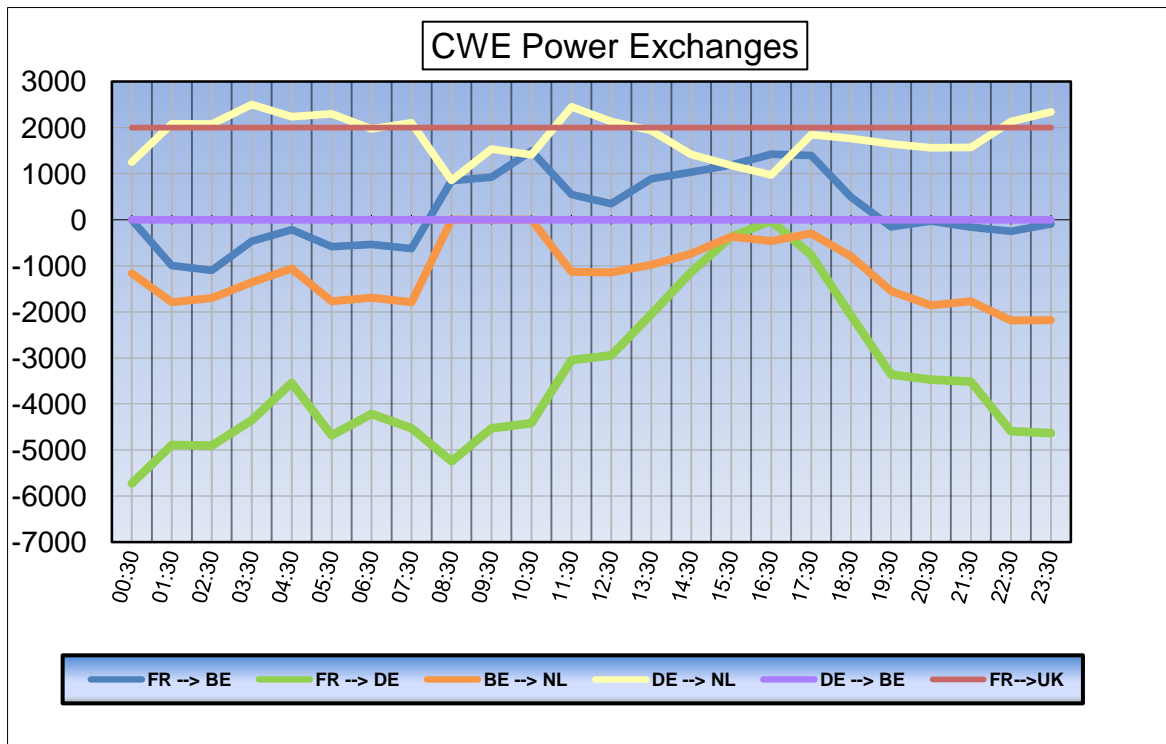
CSE

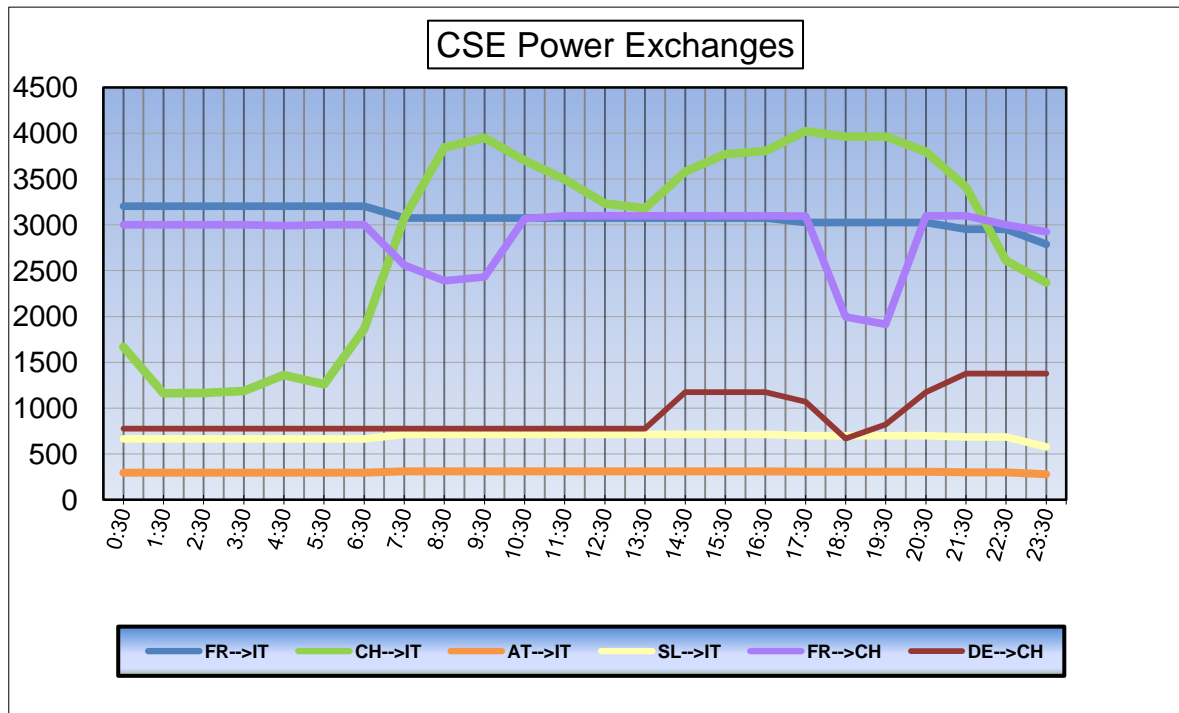
Outages table

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	Line	EULA _ Wolkramhausen 357 220 kV	28/01/2018	04/02/2018		
50HzT	Line	GUSTROW _ WESSIN 424 400 kV	02/02/2018	02/02/2018		
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	Daily	
50HzT	Line	LUBMIN _ WIKINGER 281 220 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	
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	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	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	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		
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	06/02/2018		
S.GRID	Line	LIMMERN _ TIERFEHD 1 400 kV	28/01/2018	31/07/2018		
S.GRID	Line	VERBANO _ AVEGNO 1 225 kV	02/02/2018	02/02/2018		

Owner	Type of element	Line name	start	end	Comments
S.GRID	Nuc.Gen	BEZNAU _ BEZNAU G12 220 kV	13/03/2015	28/02/2018	182 MW
S.GRID	Transformer	BASSE COURT _ Transformer 400 kV	13/12/2017	31/03/2018	Trafo 32
TENNET DE	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	DIPPERZ _ GROSSKROTZENBURG 2 400 kV	02/02/2018	02/02/2018	
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	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	
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	
TERNA / S.GRID	Line	AVEGNO _ VERBANO 2 220 kV	02/02/2018	02/02/2018	
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	03:30	07:30	08:30	09:30	10:30	12:30	14:30	16:30	17:30	19:30	22:30	23:30
BE	FR	ACHENE	LONNY	380.19	343	479	442	398	305	301	126	15	20	493	517	441
BE	FR	AUBANGE	MONT ST MARTIN	220.51	24	52	25	31	-9	-12	-57	-88	-86	41	84	46
BE	FR	AUBANGE	MOULAIN	220.51	20	39	20	19	-17	-22	-63	-99	-92	30	67	34
BE	FR	AVELGEM	AVELIN	380.80	403	719	704	604	437	388	15	-194	-134	514	447	344
BE	FR	AVELGEM	MASTAING	380.79	91	74	65	13	-66	-63	-212	-301	-301	-39	-44	-77
BE	FR	MONCEAU	CHOOZ	220.48	-67	-68	-82	-99	-131	-140	-160	-179	-177	-109	-84	-91
BE	NL	VAN EYCK 1	MAASBRACHT	380.27	0	0	0	0	-636	-601	-496	-419	-433	-696	-806	-700
BE	NL	VAN EYCK 2	MAASBRACHT	380.28	-917	-980	-782	-836	-418	-381	-219	-87	-41	-437	-666	-522
BE	NL	ZANDVLIET	BORSSELE	380.29	-473	-944	-877	-822	-801	-833	-771	-728	-671	-881	-922	-948
BE	NL	ZANDVLIET	GEERTRUIDENBERG	380.30	-244	-366	-251	-129	-85	-77	36	118	156	-287	-406	-483
BE	LU	BELVAL	SCHIFFLANGE	220.511	-91	-179	-123	-114	-87	-66	13	64	57	-38	-135	-150

BE	FR	TOTAL		814	1295	1174	966	519	452	-351	-846	-770	930	987	697
BE	NL	TOTAL		-1634	-2290	-1910	-1787	-1940	-1892	-1450	-1116	-989	-2301	-2800	-2653
BE	LU	TOTAL		-91	-179	-123	-114	-87	-66	13	64	57	-38	-135	-150
TOTAL BELGIAN IMPORT/EXPORT				-911	-1174	-859	-935	-1508	-1506	-1788	-1898	-1702	-1409	-1948	-2106

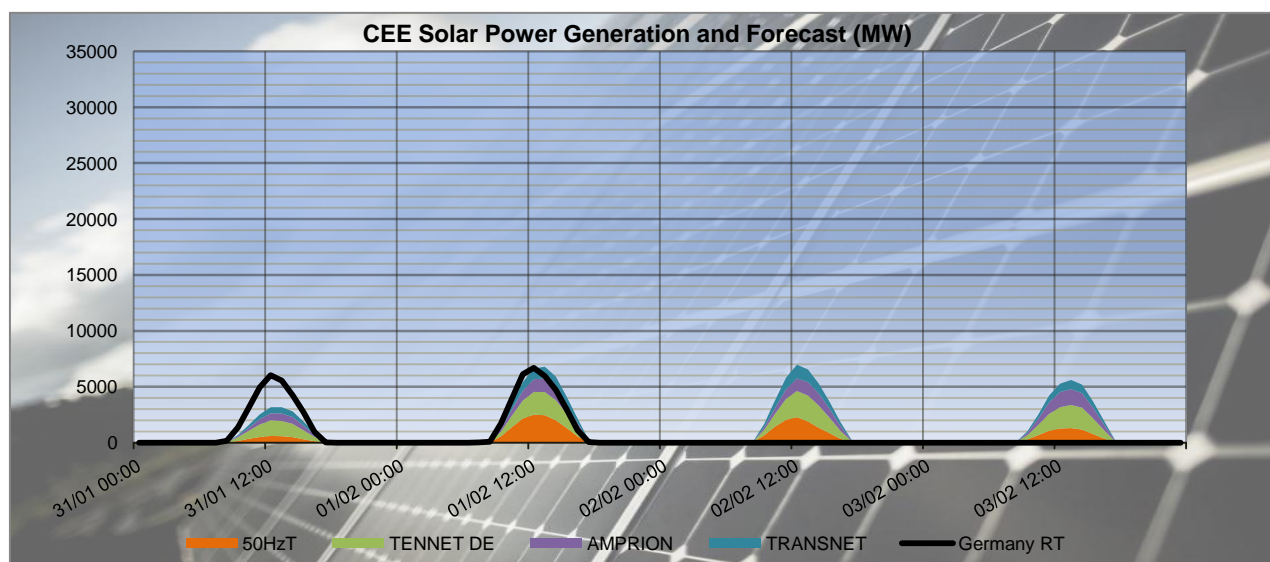
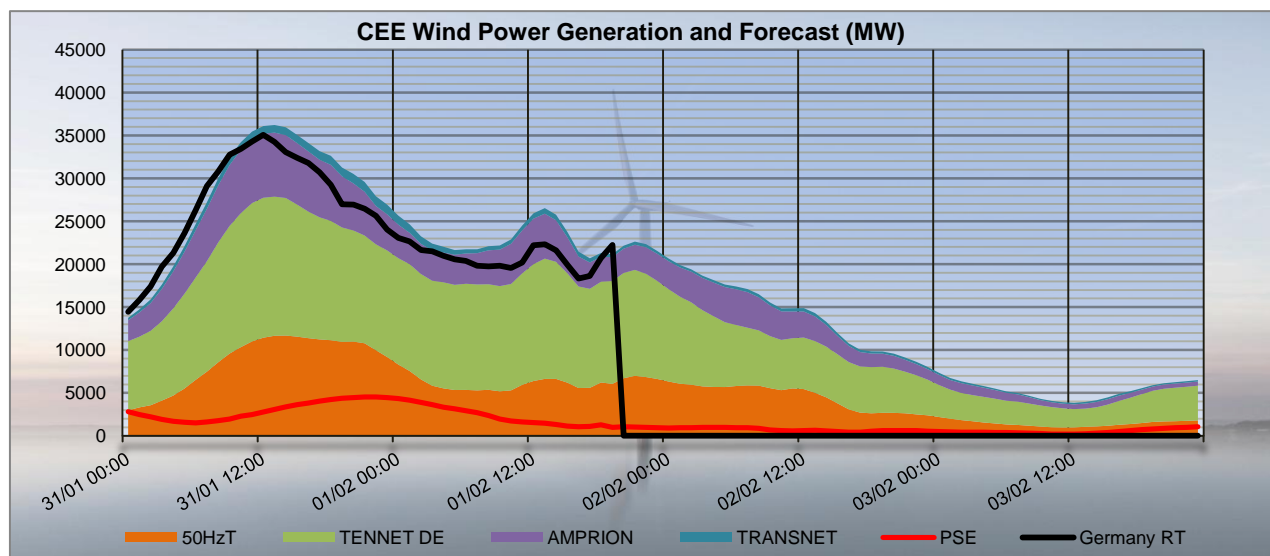
PST taps in DACF	Zandvliet 1	10	10	10	12	12	12	12	12	12	12	12	12	15
	Zandvliet 2	10	10	10	12	12	12	12	12	12	12	12	12	15
	Van Eyck 1					15	15	15	15	15	15	15	15	15
	Van Eyck 2	12	12	12	15	15	15	15	15	15	15	15	15	15
	Average	11	11	11	13	14	14	14	14	14	14	14	14	15

CREOS PST in DACF	Schiffange	15	15	15	17	17	17	17	17	17	17	17	17	17
-------------------	------------	----	----	----	----	----	----	----	----	----	----	----	----	----

Proposal for real time after D-1 studies

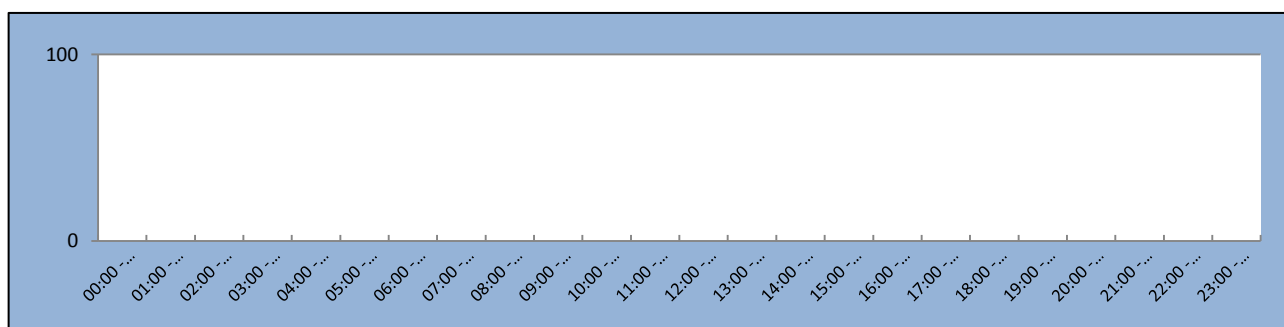
Timestamps	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
PSTs																								
Zandvliet PST 1	[1;35]	10	10	10	10	10	10	10	10	10	12	12	12	12	12	12	12	12	12	12	12	12	12	13
Zandvliet PST 2	[1;35]	10	10	10	10	10	10	10	10	10	12	12	12	12	12	12	12	12	12	12	12	12	12	13
Van Eyck PST 1	[1;35]	0	0	0	0	0	0	0	0	0	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Van Eyck PST 2	[1;35]	12	12	12	12	12	12	12	12	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Schiffange PST 1	[1;35]	13	13	13	13	13	13	13	13	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17

CEE Renewable Power Generation & Forecast

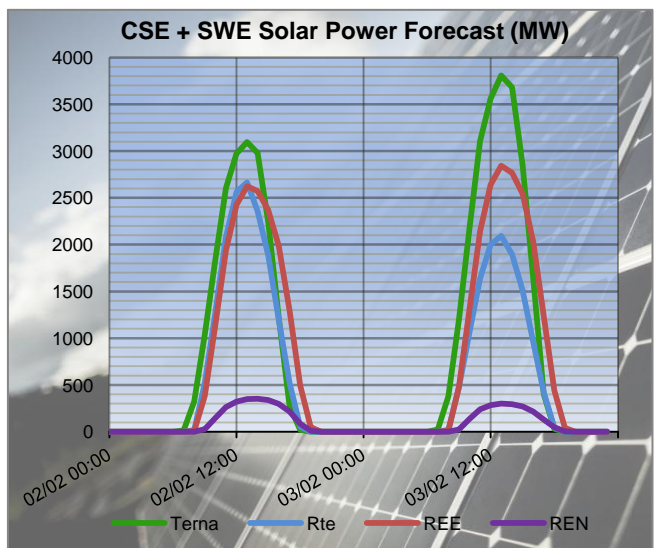
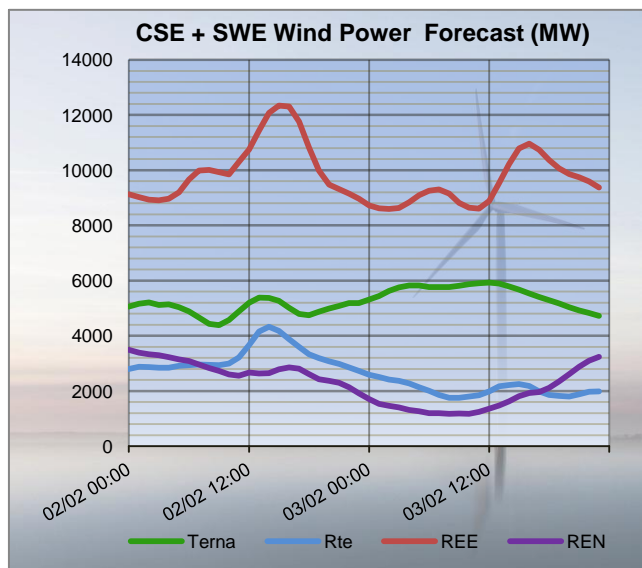
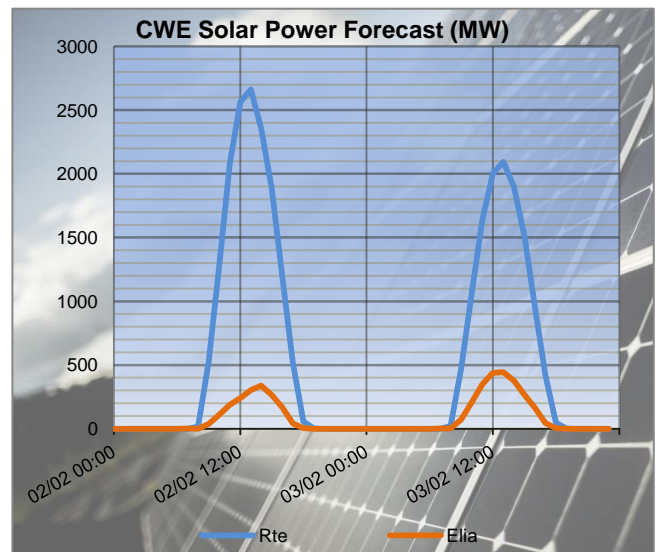
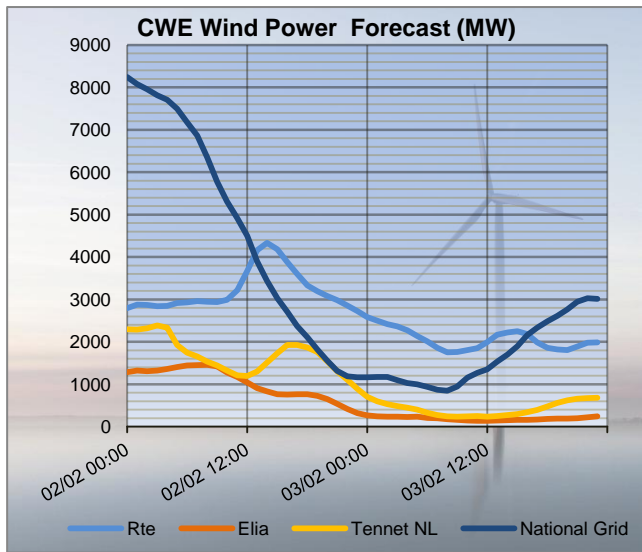


The charts above show the wind and solar generation forecasts for the TSOs in CEE (most significant) from D+1 until D-2 and the realised generation in Germany in real time. Source: Meteologica and 50HzT (RT)

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	-142	-343	-201	-348	-479	-131	-76	-305	-229	-70	-301	-231
FR	BE	MONT ST MARTIN	AUBANGE	-54	-24	30	-141	-52	89	-37	9	46	-17	12	29
FR	BE	MOULAIN	AUBANGE	-48	-20	28	-123	-39	84	-27	17	44	-6	22	28
FR	BE	AVELIN	AVELGEM	-146	-403	-257	-453	-719	-266	-83	-437	-354	-87	-388	-301
FR	BE	MASTAING	AVELGEM	74	-91	-165	106	-74	-180	304	66	-238	264	63	-201
FR	BE	CHOOZ	MONCEAU	83	67	-16	111	68	-43	165	131	-34	160	140	-20
FR	DE	MUHLBACH	EICHSTETTEN	-64	108	172	-31	9	40	26	145	119	103	208	105
FR	DE	VOGELGRUN	EICHSTETTEN	-142	-51	91	-88	-36	52	-67	-3	64	-47	-58	-11
FR	DE	ST AVOLD	ENSDORF	0	0	0	0	0	0	0	0	0	0	0	0
FR	DE	VIGY	ENSDORF 1	-430	-308	122	-515	-353	162	-267	-36	231	-154	47	201
FR	DE	VIGY	ENSDORF 2	-592	-446	146	-541	-363	178	-258	7	265	-121	108	229

				17:30			19:30			23:30		
		Node 1	Node 2	DACF	Merge	Delta	DACF	Merge	Delta	DACF	Merge	Delta
FR	BE	LONNY	ACHENE	167	-20	-187	-304	-493	-189	-198	-441	-243
FR	BE	MONT ST MARTIN	AUBANGE	48	86	38	-54	-41	13	-41	-46	-5
FR	BE	MOULAIN	AUBANGE	54	92	38	-42	-30	12	-29	-34	-5
FR	BE	AVELIN	AVELGEM	237	134	-103	-394	-514	-120	-247	-344	-97
FR	BE	MASTAING	AVELGEM	383	301	-82	128	39	-89	150	77	-73
FR	BE	CHOOZ	MONCEAU	187	177	-10	139	109	-30	166	91	-75
FR	DE	MUHLBACH	EICHSTETTEN	469	466	-3	-103	16	119	-263	-77	186
FR	DE	VOGELGRUN	EICHSTETTEN	40	64	24	-69	-19	50	-116	-45	71
FR	DE	ST AVOLD	ENSDORF	0	0	0	0	0	0	0	0	0
FR	DE	VIGY	ENSDORF 1	246	425	179	-169	-13	156	-438	-214	224
FR	DE	VIGY	ENSDORF 2	339	543	204	-177	11	188	-455	-205	250

				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	232	213	-19	54	124	70	151	196	45	170	226	56
FR	CH	MAMBELIN	BASSECCOURT	-188	-164	24	-313	-287	26	-224	-155	69	-201	-134	67
FR	CH	SIERENTZ	BASSECCOURT	650	642	-8	507	513	6	424	479	55	434	474	40
FR	CH	BOIS TOLLLOT	ROMANEL	121	88	-33	-252	-105	147	-177	91	268	-116	69	185
FR	CH	SIERENTZ	LAUFENBURG	257	261	4	96	51	-45	136	114	-22	150	167	17
FR	CH	CORNIER	RIDDES	-45	-15	30	-107	-63	44	-79	13	92	-57	10	67
FR	CH	CORNIER	ST TRIPHON	-80	-40	40	-97	-74	23	-70	4	74	-45	-6	39
FR	CH	PRESSY	VALLORCINES	-139	-101	38	-232	-219	13	-242	-83	159	-146	-113	33
FR	CH	BOIS TOLLLOT	VERBOIS	145	173	28	219	214	-5	260	266	6	276	253	-23
FR	CH	GENISSIAT	VERBOIS	88	103	15	33	62	29	71	136	65	91	123	32
FR	CH	GENISSIAT	VERBOIS	88	103	15	33	62	29	71	136	65	91	123	32
FR	IT	ALBERTVILLE	RONDISSONE	598	552	-46	686	588	-98	878	607	-271	830	615	-215
FR	IT	ALBERTVILLE	RONDISSONE	635	563	-72	760	633	-127	966	576	-390	910	695	-215
FR	IT	MENTON	CAMPOROSSO	248	202	-46	154	202	48	143	194	51	145	194	49
FR	IT	VILLARODIN	VENAUS	64	205	141	577	686	109	842	969	127	788	947	159

				17:30			19:30			23:30		
		Node 1	Node 2	DACF	Merge	Delta	DACF	Merge	Delta	DACF	Merge	Delta
FR	CH	SIERENTZ	ASPHARD	319	337	18	-19	108	127	34	129	95
FR	CH	MAMBELIN	BASSECCOURT	-56	-6	50	-332	-231	101	-299	-221	78
FR	CH	SIERENTZ	BASSECCOURT	357	421	64	372	389	17	588	546	-42
FR	CH	BOIS TOLLLOT	ROMANEL	-93	118	211	-268	-228	40	22	1	-21
FR	CH	SIERENTZ	LAUFENBURG	256	209	-47	-38	5	43	38	87	49
FR	CH	CORNIER	RIDDES	-49	40	89	-117	-56	61	-73	-25	48
FR	CH	CORNIER	ST TRIPHON	-37	27	64	-115	-66	49	-98	-63	35
FR	CH	PRESSY	VALLORCINES	-203	-61	142	-254	-214	40	-175	-117	58
FR	CH	BOIS TOLLLOT	VERBOIS	245	247	2	155	188	33	151	156	5
FR	CH	GENISSIAT	VERBOIS	112	161	49	47	74	27	80	78	-2
FR	CH	GENISSIAT	VERBOIS	112	161	49	47	74	27	80	78	-2
FR	IT	ALBERTVILLE	RONDISSONE	980	704	-276	779	523	-256	586	323	-263
FR	IT	ALBERTVILLE	RONDISSONE	1092	710	-382	895	511	-384	658	268	-390
FR	IT	MENTON	CAMPOROSSO	143	201	58	156	205	49	144	207	63
FR	IT	VILLARODIN	VENAUS	932	1090	158	777	956	179	468	663	195

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	42	2448	47
	Doel - Mercator (51)	2239	49	2239	55
	Doel - Mercator (52)	2239	0	2239	0
	Doel - Mercator (54)	2448	49	2448	55
	Doel - Zandvliet (25)	2349	18	2349	26
	Mercator - Horta (73)	2569	29	2569	39
	Courcelles - Gramme (31)	2349	47	2349	52
	Mercator - Rodenhuize/Horta (74)	2325	32	2349	43
RTE	Attaques - Warande 2	3780	60	3780	60
	Avelin - Gavrelle	2622	52	2622	55
	Avelin - Warande	3458	6	3458	4
	Lonny - Seuil	4149	27	4149	28
	Mandarins - Warande 1	3780	56	3780	56
	Muhlbach - Scheer	2598	25	2598	17
	Revigny - Vigy	2596	43	2596	44
	Warande - Weppes	3458	13	3458	11

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	28
		Hagenwerder - Mikulowa (567)	2520	10	2520	18
		Hagenwerder - Mikulowa (568)	2520	10	2520	17
		Remptendorf - Redwitz (413)	3507	55	3507	49
		Remptendorf - Redwitz (414)	3507	55	3507	49
		Röhrsdorf - Hradec (445)	2520	38	2520	23
		Röhrsdorf - Hradec (446)	2520	38	2520	23
		Vieselbach - Mecklar (449-1)	2520	28	2520	30
		Wolmirstedt - Helmstedt (491-1)	2400	9	2400	3
		Wolmirstedt - Helmstedt (492-2)	2400	9	2400	3
	220 kV	Vierraden - Krajnik (507)	1370	0	1352	0
		Vierraden - Krajnik (508)	1370	0	1352	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	
Elia	00:30 & 07:30 & 19:30-20:30 & 22:30:00-24:00	380	Mercator	Busbar	1A	109%	380	Doel	Mercator	54	23:30
		Preventive action: Decrease -2 taps on Zandvliet PSTs (15->13) -> 104% remaining.									
		Curative action: Decrease -2 taps on Zandvliet PSTs (13->11) -> 99% remaining									
Rte	07:30 - 11:30	380	Warrande	Mandarins	1	106%	380	Warrande	Attaques	2	08:30
		Curative action: 2 Nodes in Warrande (open coupling device 1AB & 2BC) -> 89% remaining									
50HzT	01:30 - 02:30	380	Bärwalde	Schmölln	axis	105%	380	Bärwalde	Schmölln	remaining	01:30
		Preventive action: 2 nodes in Schmölln & 2 nodes in Graustein --> 89% remaining, then redispatching.									
50HzT	12:30 - 14:30	380	Rohrsdorf	Streumen	axis	101%	380	Rohrsdorf	Streumen	remaining	01:30
		Preventive action: Decrease -3 taps on Hradec PSTs -> 100%.									

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	

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	Avelgem	Bus bar	R1	106%	150	Koksijde	Slijkens	361	

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): **20:30**

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 : **69 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 925 MW (target flow : 800 MW not reachable with tap positions)
- 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 La Praz on **tap 1**

Special topologies

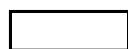
Nodes in South area				
			Off Peak	Peak
380 kV	Swissgrid	Sils	1	1
		Robbia	2	2
	Rte	Génissiat	1	1
		Albertville	2	2
		Grande Ile	1	1
	Terna	Turbigo	1	1
		Baggio	1	1
		Bovisio	2	2
		Ostiglia	1	1

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	36	2370	35
		Albertville - Rondissone 2	2370	37	2370	33
		Bulciago - Soazza	2300	28	2300	46
		Cagno - Mendrisio	855	16	855	37
		Musignano - Lavorgo	2270	49	2270	61
		Redipuglia - Divaca	2450	37	2450	35
		Robbia - San Fiorano	2530	32	2530	61
		Robbia - Gorlago	2530	44	2530	67
		Venaus - Villarodin	2715	14	2715	49
	220 kV	Airolo - Ponte	900	12	900	8
		Lienz - Soverzene	704	44	704	41
		Menton - Campo Rosso	1165	42	1165	41
		Padriciano - Divaca	960	37	960	85
		Riddes - Avise	1010	14	1010	20
		Riddes - Valpelline	1010	14	1010	23
		Serra - Pallanzeno	900	25	900	48

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	1577	2979	127	802
	Compensation ratio (calculated from NTC)	40%	49%	4%	8%
	Pentalateral impact on physical flows	-26%	-56%	-4%	-14%
Peak	Initial physical flows on adapted base case	2246	4470	121	936
	Compensation ratio (calculated from NTC)	37%	50%	4%	9%
	Pentalateral impact on physical flows	-27%	-54%	-4%	-15%

OFF PEAK

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

	TSO	Contingency				Constraint				
		U (kV)	Substation 1	Substation 2	Code	Overload	U (kV)	Substation 1	Substation 2	Code
Off - Peak	RTE	380	Albertville	Busbar	2A	103% 1' night	220	Albertville	Longefan-Randens	
		Preventive action : Increase 7 taps on La Praz PST (from 1 to 7) => 96% 1' night Curative action : Change tap position to tap 26 on La Praz PST -> 99% 20' night remaining on Longefan-Randens 220 kV								
	RTE	380	Chaffard	Busbar	2B	103% 20'	380	Chaffard	St Vulbas 1	
		Observability area								
After the preventive actions above mentioned, no more additional 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	111%	220	PST Padriciano		
						112%	220	Monfalcone	Redipuglia	
		Curative action : Increase 10 taps on Divaca PST (from -32 to -23) => 98 % remaining on Monfalcone-Redipuglia & 81 % remaining on the Padriciano PST								
	Swissgrid	380	Bonaduz	Sils 1 & 2	N-k	105%	380	Pradela	Sils-Robbia	
		Preventive action : 2 nodes-topology in Sils 380 kV (agreed with Swissgrid) => 88 % remaining								
	Swissgrid/ Terna	380	Robbia	San Fiorano/Gorlago	N-k	101%	380	Sils	Soazza	
		Preventive action : 2 nodes-topology in Sils 380 kV (agreed with Swissgrid) => 88 % remaining BUT 109% on Padriciano PST Curative action : Increase 10 taps on Divaca PST (from -32 to -23) => 81 % remaining on Padriciano PST								
	After the preventive actions above mentioned, no more additional 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 Pentilateral reduction).

PST	Off Peak	
	Tap position	Physical flow to Italy (MW)
La Praz (1/33)	7	125
Rondissone 1 (1/33)	33	630
Rondissone 2 (1/33)	33	605
Camporosso (-32/32)	-9	208
Lienz (-32/32)	-2	128
Padriciano (1/33)	21	148
Divaca (-32/32 each)	-7	656

PST	Peak	
	Tap position	Physical flow to Italy (MW)
La Praz (1/33)	1	619
Rondissone 1 (1/33)	10	467
Rondissone 2 (1/33)	13	504
Camporosso (-32/32)	-5	147
Lienz (-32/32)	-26	81
Padriciano (1/33)	33	290
Divaca (-32/32 each)	-32	492

Conclusion

CWE: Constraint detected in Mercator - Doel area requiring Zandvliet PSTs tapping in both preventive and curative to solve.

CEE: Constraints detected in 50Hertz area require topological actions to solve.

CSE : Constraints detected on CH-IT border require a preventive 2-nodes topology in Sils 380 kV (agreed by Swissgrid).

Other constraints are manageable with classical remedial actions.