

<p><u>CORESO Engineers</u></p> <p><u>North :</u> BRIEGERT Robin</p> <p><u>South :</u> SANTOS Eduardo</p>	<p>Day Ahead report for</p> <p>17 January 2018</p>
<p>Security Levels:</p> <p>CWE: No critical constraint detected.</p> <p>CEE: No constraint detected.</p> <p>CSE: Critical constraints found due to the forced outage of Sils - Soazza 380kV . Pentalateral reduction procedure of 600MW between CH - IT needed.</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]	10000	18:00		Tihange		1000	2	2900
						450	2	
Generation Margin	Sufficient			Coo		230	3	1170
						160	3	
			50HzT	Rostock	Pmax (MW)	530	0	0
				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]	76700	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]	48 580	17:30		Nogent s/ Seine		1300	2	2600
				Bugey		900	4	3600
Generation Margin	Sufficient			St Alban		1300	2	2600
				Cruas		900	2	1800
TERNA				Tricastin		900	4	3600
Peak load [MW]	47380	18:00						
			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

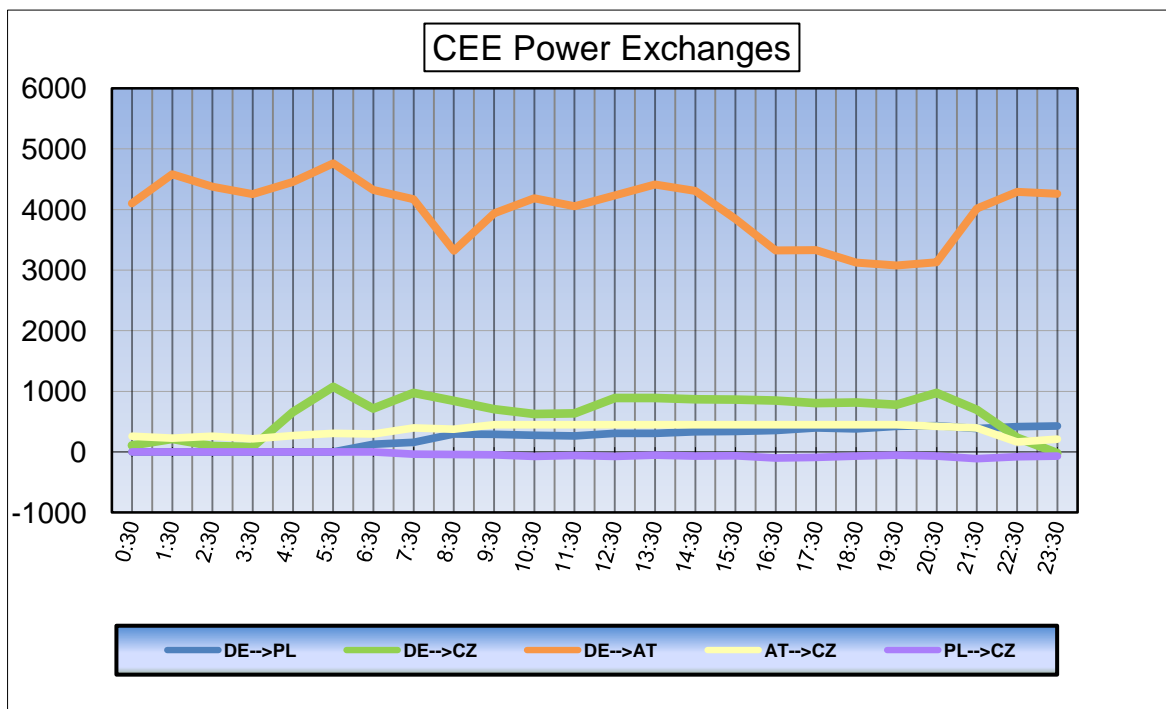
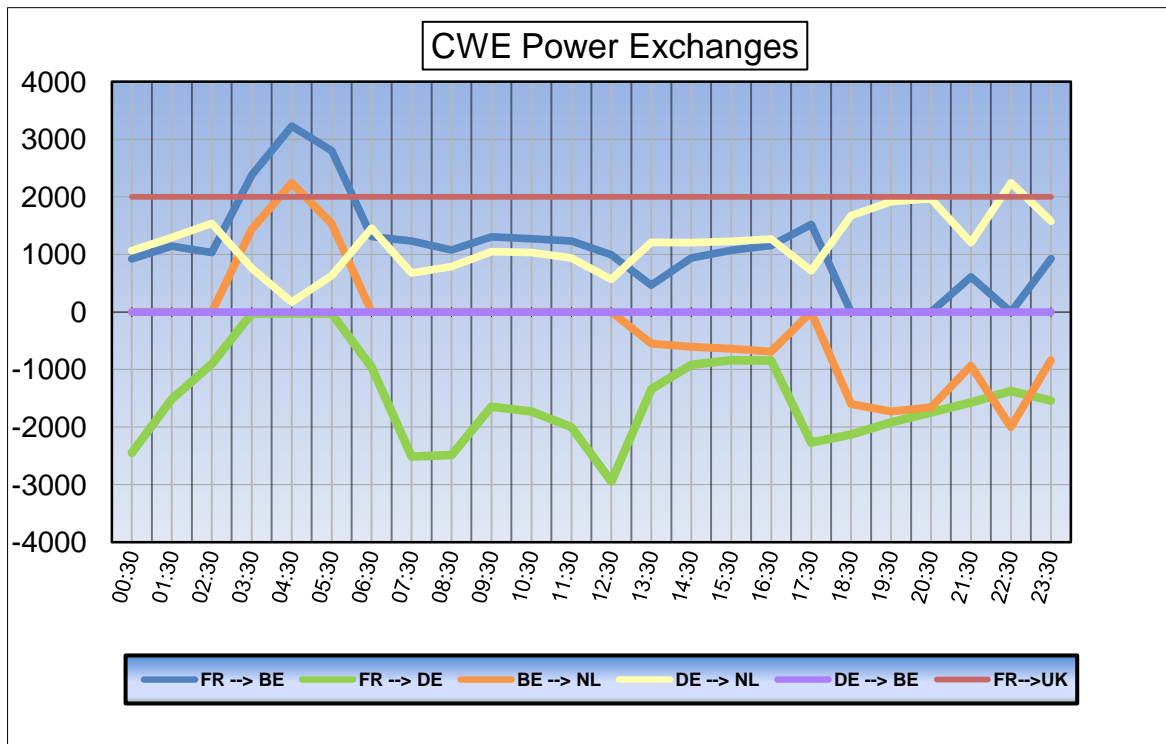
CSE

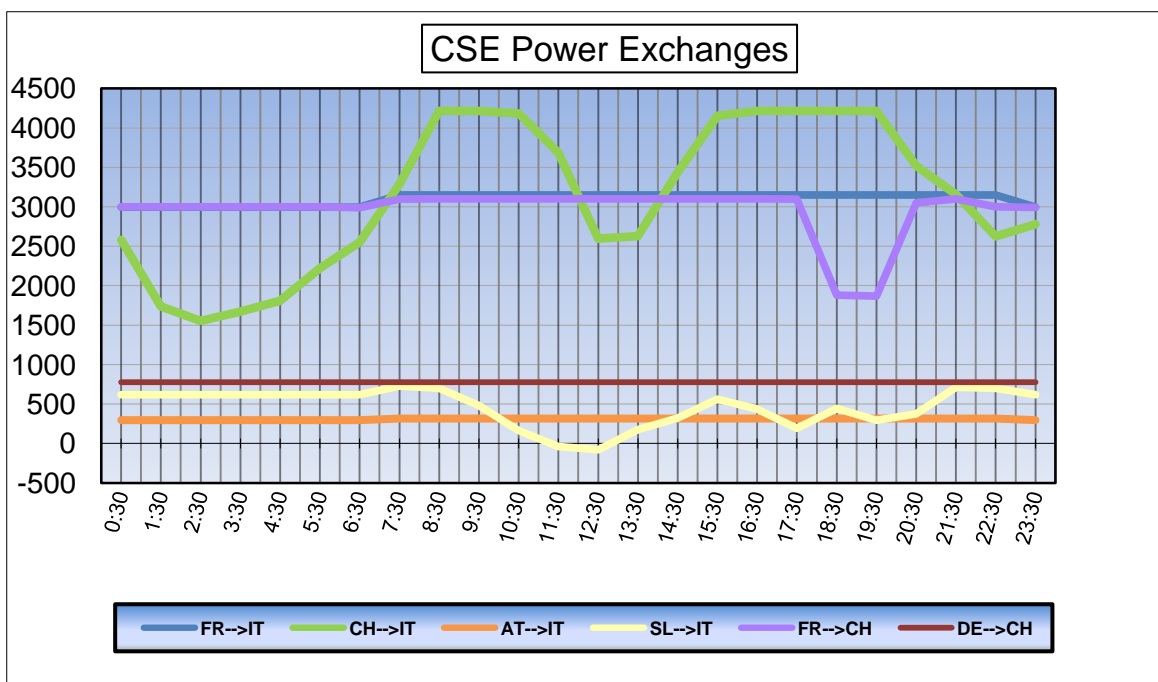
SWG: The line Sils - Soazza 380kV tripped at 16h on 16 January and was considered in outage during all day on 17 January.

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	06/10/2017	16/03/2018		
50HzT	Line	HAMBURG Nord _ BRUNSBUTTEL 951 400 kV	14/01/2018	21/01/2018		
50HzT	Line	HAMBURG Nord _ HAMBURG Ost 961 400 kV	15/01/2018	19/01/2018		
50HzT	Line	KRUMMEL _ WESSIN 420 400 kV	17/01/2018	17/01/2018		
50HzT	Line	LUBMIN _ WIKINGER 281 220 kV	26/09/2017	31/01/2018		
50HzT	Line	MARKERSBACH _ T connection ZWOENITZ 400 kV	15/01/2018	17/01/2018		
50HzT	Line	REMPENDORF _ WEIDA 575 400 kV	16/01/2018	17/01/2018		
50HzT	Line	ROHRSDORF _ T connection ZWOENITZ 400 kV	15/01/2018	17/01/2018		
50HzT / PSE	Line	KRAJNIK _ VIERRADEN 507 225 kV	22/06/2016	21/01/2018	Long term outage	
50HzT / PSE	Line	KRAJNIK _ VIERRADEN 508 225 kV	22/06/2017	21/01/2018	Long term outage	
AMP / TEN DE	Line	NEHDEN _ TWISTETAL W 400 kV	08/01/2018	23/02/2018		
AMPRION	Line	NEHDEN _ ARPE Sud 400 kV	15/01/2018	02/02/2018		
APG	Line	ST PETER _ Salzburg 455 220 kV	15/01/2018	19/01/2018	ALTERNATING WITH 456	
APG	Line	ST PETER _ Salzburg 456 220 kV	15/01/2018	19/01/2018	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		
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	POLANIEC _ TARNOW 400 kV	15/01/2018	19/01/2018		
PSE	Line	TUCZNAWA _ RZESZOW 400 kV	15/01/2018	19/01/2018		
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		
S.GRID	Line	CHAMOSON _ MUHLEBERG "Sanetsch 2" 220 kV	24/10/2017	30/03/2018		
S.GRID	Line	LIMMERN _ TIERFEHD 1 400 kV	28/01/2017	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	
TENNET DE	Line	BERGSHAUSEN _ GROHNDE 1 400 kV	15/01/2018	19/01/2018		
TENNET DE	Line	GROHNDE _ ALGERMISSEN 2 400 kV	15/01/2018	17/01/2018		
TENNET DE	Line	ISAR _ OTTENHOFEN 443 400 kV	17/01/2018	17/01/2018		
TENNET DE	Line	TWISTETAL _ BORKEN 3 400 kV	16/05/2017	11/10/2018		
TENNET NL	Line	BLEISWIJK _ KRIMPEN ZT 400 kV	15/01/2018	19/01/2018	Daily	
TENNET NL	Line	HENGEL _ ZWOLLE WT 400 kV	13/01/2018	19/01/2018	permanent	
TERNA	Line	DUGALE _ SANDRIGO 360 400 kV	17/01/2018	17/01/2018		
TERNA	Line	PIAN CAMUNO _ S.FIORANO 358 400 kV	09/01/2018	19/01/2018	Forced outage	
TransnetBW	Line	NEUROT _ PHILIPPSBURG RT 400 kV	15/01/2018	07/02/2018		

Exchange program forecasts





ELIA expected flows & PSTs tap position

		Node 1	Node 2	Order	01:30	03:30	06:30	07:30	08:30	10:30	12:30	17:30	18:30	19:30	21:30	23:30
BE	FR	ACHENE	LONNY	380.19	-56	-331	-51	65	149	18	163	122	292	259	179	83
BE	FR	AUBANGE	MONT ST MARTIN	220.51	-37	-151	-65	28	58	-25	10	28	48	21	20	-6
BE	FR	AUBANGE	MOULAIN	220.51	-35	-145	-63	21	49	-28	5	21	39	13	12	-3
BE	FR	AVELGEM	AVELIN	380.80	-255	-548	-314	2	45	-72	156	-75	251	251	72	-159
BE	FR	AVELGEM	MASTAING	380.79	-198	-331	-269	-188	-190	-232	-103	-223	-81	-100	-132	-239
BE	FR	MONCEAU	CHOOZ	220.48	-138	-181	-182	-143	-146	-155	-112	-162	-138	-131	-134	-152
BE	NL	VAN EYCK 1	MAASBRACHT	380.27	-264	-41	-286	-317	-339	-287	-321	-385	-524	-526	-465	-457
BE	NL	VAN EYCK 2	MAASBRACHT	380.28	33	362	208	179	231	258	115	139	-124	-162	-148	-101
BE	NL	ZANDVLIET	BORSSELE	380.29	-214	-81	-362	-747	-760	-722	-770	-774	-918	-880	-500	-387
BE	NL	ZANDVLIET	GEERTRUIDENBERG	380.30	-19	291	17	-51	-101	-4	-111	-167	-402	-417	-462	-337
BE	LU	BELVAL	SCHIFFLANGE	220.511	22	198	43	-108	-96	-36	-35	-67	-71	-79	5	-21

BE	FR	TOTAL		-719	-1687	-944	-215	-35	-494	119	-289	411	313	17	-476
BE	NL	TOTAL		-464	531	-423	-936	-969	-755	-1087	-1187	-1968	-1985	-1575	-1282
BE	LU	TOTAL		22	198	43	-108	-96	-36	-35	-67	-71	-79	5	-21
TOTAL BELGIAN IMPORT/EXPORT				-1161	-958	-1324	-1259	-1100	-1285	-1003	-1543	-1628	-1751	-1553	-1779

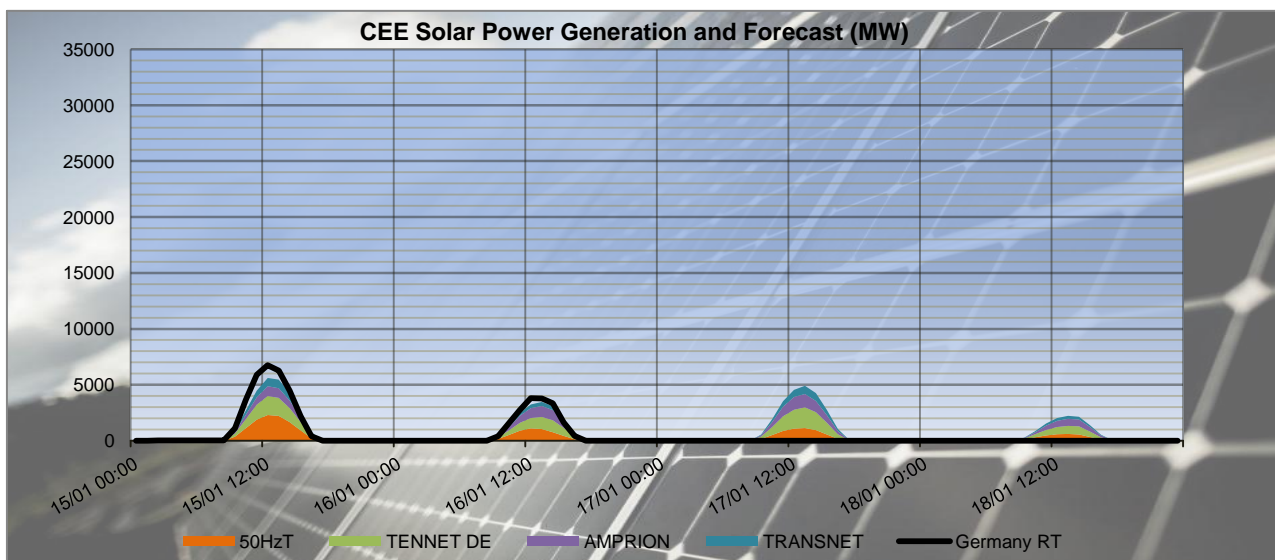
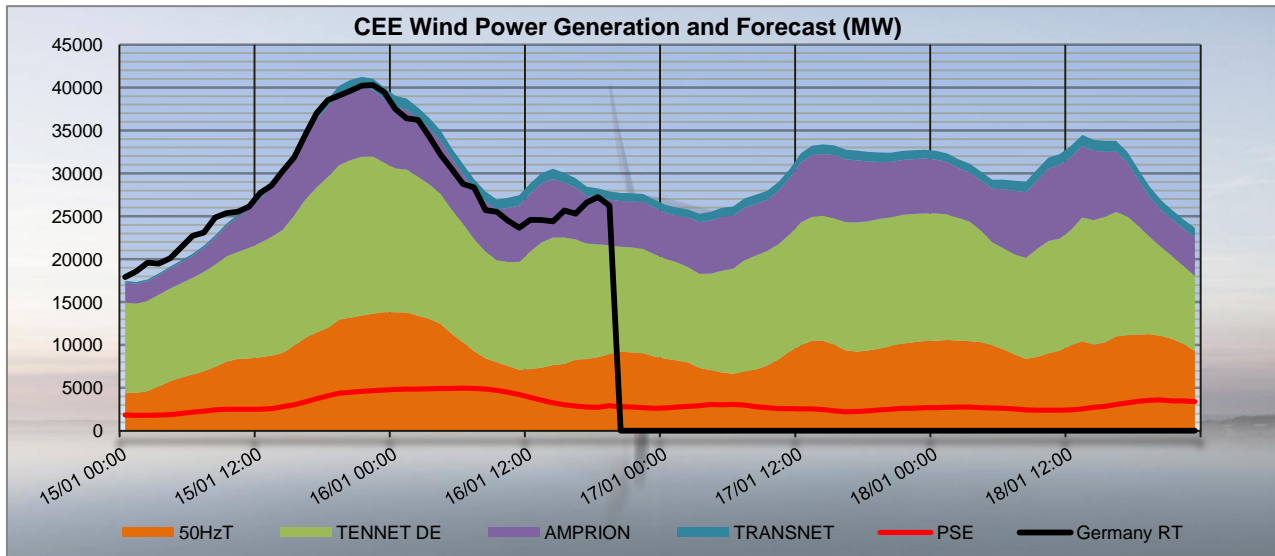
PST taps in DACF	Zandvliet 1	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	Zandvliet 2	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	Van Eyck 1	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	Van Eyck 2	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	Average	12	12	12	12	12	12	12	12	12	12	12	12	12	12

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

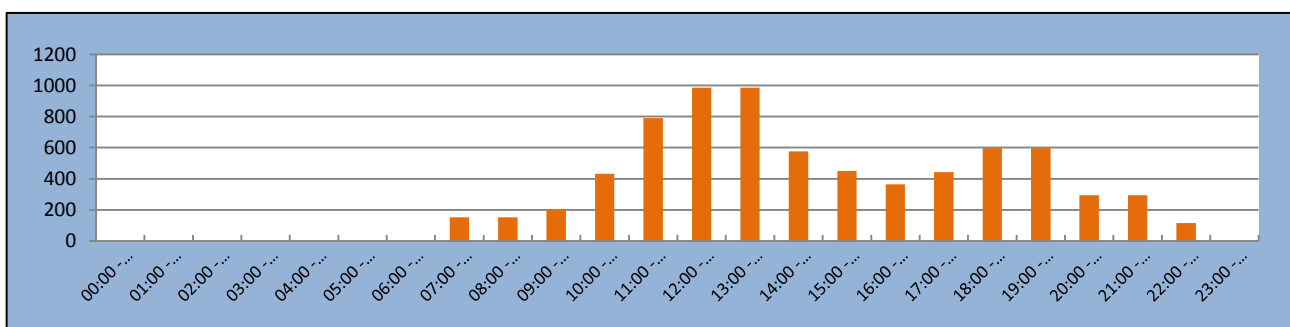
Timestamps	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
PSTs																								
Zandvliet PST 1	[1;35]	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Zandvliet PST 2	[1;35]	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Van Eyck PST 1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

CEE Renewable Power Generation & Forecast

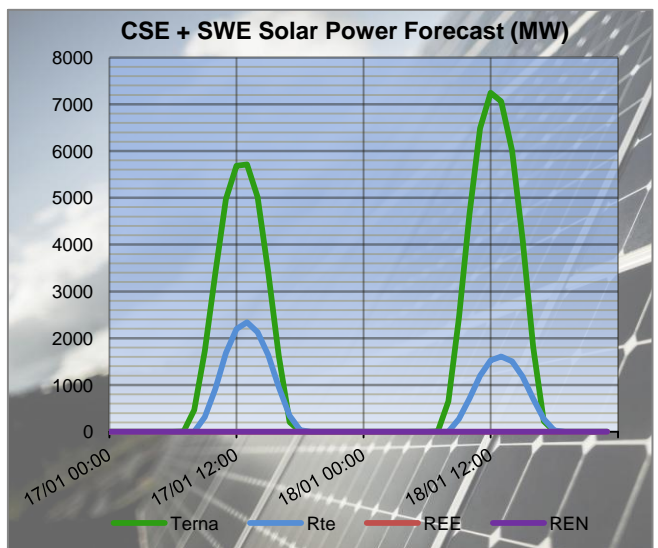
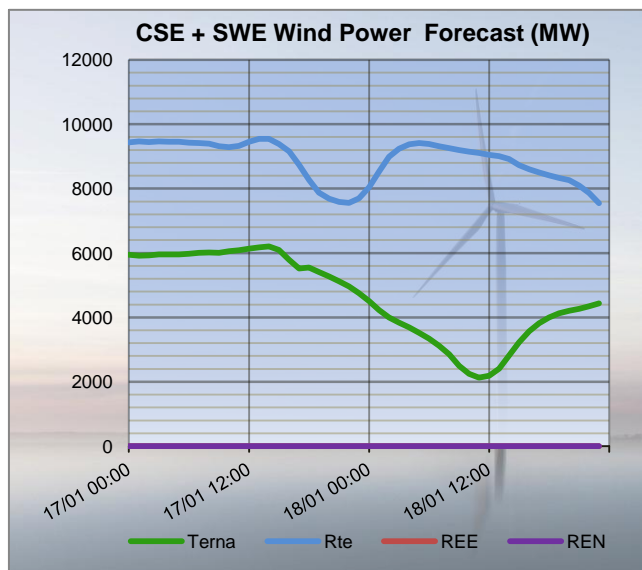
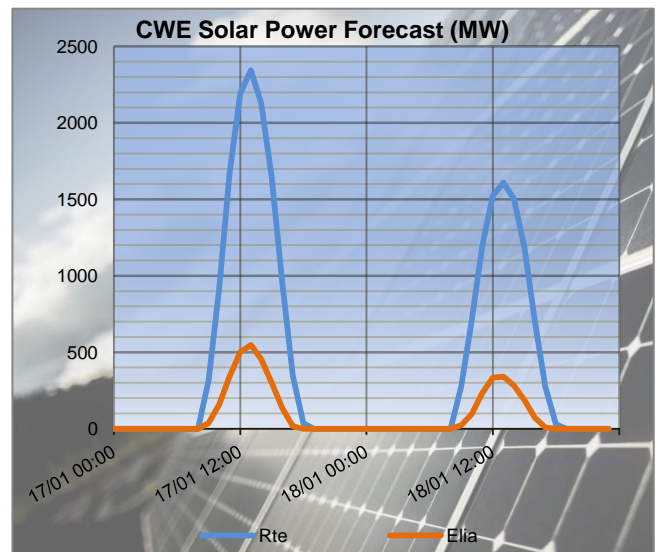
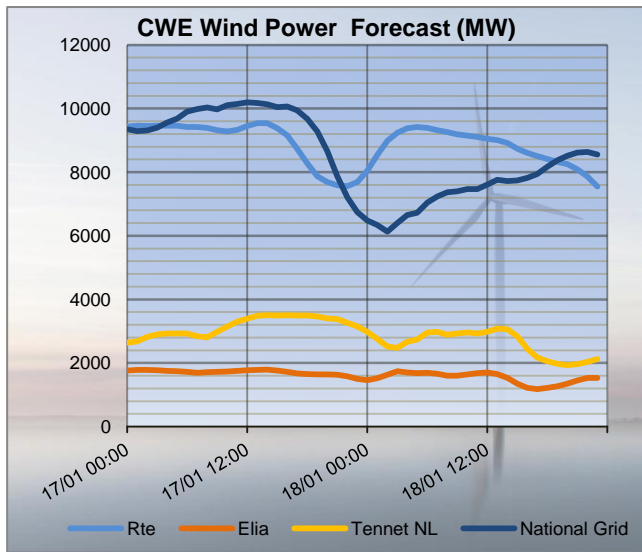


The charts above show the wind and solar generation forecasts for the TSOs in CEE (most significant) from D+1 until D-2 and the realised generation in Germany in real time. Source: Meteologica and 50HzT (RT)

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	472	331	-141	141	-65	-206	192	-18	-210	-5	-163	-158
FR	BE	MONT ST MARTIN	AUBANGE	66	151	85	32	-28	-60	103	25	-78	68	-10	-78
FR	BE	MOULAIN	AUBANGE	64	145	81	36	-21	-57	101	28	-73	69	-5	-74
FR	BE	AVELIN	AVELGEM	828	548	-280	262	-2	-264	312	72	-240	75	-156	-231
FR	BE	MASTAING	AVELGEM	532	331	-201	362	188	-174	396	232	-164	259	103	-156
FR	BE	CHOOZ	MONCEAU	0	181	181	0	143	143	0	155	155	0	112	112
FR	DE	MUHLBACH	EICHSTETTEN	630	737	107	305	482	177	313	482	169	270	385	115
FR	DE	VOGELGRUN	EICHSTETTEN	44	90	46	22	61	39	-14	65	79	-26	46	72
FR	DE	ST AVOLD	ENSDORF	0	0	0	0	0	0	0	0	0	0	0	0
FR	DE	VIGY	ENSDORF 1	564	533	-31	215	156	-59	144	201	57	-81	38	119
FR	DE	VIGY	ENSDORF 2	427	416	-11	174	128	-46	124	202	78	-120	22	142

				17:30			19:30			23:30		
		Node 1	Node 2	DACF	Merge	Delta	DACF	Merge	Delta	DACF	Merge	Delta
FR	BE	LONNY	ACHENE	98	-122	-220	-14	-259	-245	297	-83	-380
FR	BE	MONT ST MARTIN	AUBANGE	61	-28	-89	77	-21	-98	138	6	-132
FR	BE	MOULAIN	AUBANGE	64	-21	-85	80	-13	-93	128	3	-125
FR	BE	AVELIN	AVELGEM	270	75	-195	38	-251	-289	524	159	-365
FR	BE	MASTAING	AVELGEM	359	223	-136	298	100	-198	474	239	-235
FR	BE	CHOOZ	MONCEAU	0	162	162	0	131	131	0	152	152
FR	DE	MUHLBACH	EICHSTETTEN	447	527	80	116	284	168	270	544	274
FR	DE	VOGELGRUN	EICHSTETTEN	21	81	60	-61	43	104	-40	55	95
FR	DE	ST AVOLD	ENSDORF	0	0	0	0	0	0	0	0	0
FR	DE	VIGY	ENSDORF 1	3	162	159	-285	-25	260	-54	73	127
FR	DE	VIGY	ENSDORF 2	-34	150	184	-389	-90	299	-99	65	164

				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	459	443	-16	168	264	96	252	267	15	230	230	0
FR	CH	MAMBELIN	BASSECCOURT	32	102	70	-220	-145	75	-165	-87	78	-190	-141	49
FR	CH	SIERENTZ	BASSECCOURT	403	451	48	413	474	61	363	419	56	425	447	22
FR	CH	BOIS TOLLLOT	ROMANEL	265	257	-8	55	20	-35	94	-47	-141	137	94	-43
FR	CH	SIERENTZ	LAUFENBURG	403	542	139	96	224	128	171	252	81	182	247	65
FR	CH	CORNIER	RIDDES	20	97	77	-46	5	51	-32	2	34	-24	18	42
FR	CH	CORNIER	ST TRIPHON	35	94	59	-74	-37	37	-73	-27	46	-42	2	44
FR	CH	PRESSY	VALLORCINES	-57	23	80	-173	-117	56	-203	-138	65	-106	-114	-8
FR	CH	BOIS TOLLLOT	VERBOIS	198	245	47	215	221	6	218	284	66	288	312	24
FR	CH	GENISSIAT	VERBOIS	180	200	20	149	143	-6	148	154	6	180	183	3
FR	CH	GENISSIAT	VERBOIS	180	200	20	149	143	-6	148	154	6	180	183	3
FR	IT	ALBERTVILLE	RONDISSONE	820	649	-171	806	868	62	941	921	-20	823	824	1
FR	IT	ALBERTVILLE	RONDISSONE	894	640	-254	855	907	52	1048	1006	-42	859	847	-12
FR	IT	MENTON	CAMPOROSSO	252	179	-73	151	156	5	149	269	120	147	39	-108
FR	IT	VILLARODIN	VENAUS	417	776	359	550	817	267	773	921	148	576	748	172

				17:30			19:30			23:30		
		Node 1	Node 2	DACF	Merge	Delta	DACF	Merge	Delta	DACF	Merge	Delta
FR	CH	SIERENTZ	ASPHARD	338	316	-22	179	140	-39	311	350	39
FR	CH	MAMBELIN	BASSECCOURT	-103	-67	36	-292	-209	83	-187	-90	97
FR	CH	SIERENTZ	BASSECCOURT	366	416	50	336	383	47	432	483	51
FR	CH	BOIS TOLLLOT	ROMANEL	-73	-14	59	-70	-266	-196	128	111	-17
FR	CH	SIERENTZ	LAUFENBURG	275	283	8	90	132	42	334	457	123
FR	CH	CORNIER	RIDDES	-66	8	74	-73	-57	16	-27	28	55
FR	CH	CORNIER	ST TRIPHON	-78	-22	56	-121	-70	51	-55	-8	47
FR	CH	PRESSY	VALLORCINES	-231	-149	82	-237	-203	34	-143	-88	55
FR	CH	BOIS TOLLLOT	VERBOIS	236	281	45	134	277	143	211	285	74
FR	CH	GENISSIAT	VERBOIS	132	163	31	63	101	38	101	138	37
FR	CH	GENISSIAT	VERBOIS	132	163	31	63	101	38	101	138	37
FR	IT	ALBERTVILLE	RONDISSONE	953	949	-4	879	863	-16	778	595	-183
FR	IT	ALBERTVILLE	RONDISSONE	1044	1018	-26	970	936	-34	846	593	-253
FR	IT	MENTON	CAMPOROSSO	147	30	-117	154	111	-43	148	313	165
FR	IT	VILLARODIN	VENAUS	776	931	155	816	977	161	534	866	332

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	38	2448	39
	Doel - Mercator (51)	2239	32	2239	41
	Doel - Mercator (52)	2239	32	2239	41
	Doel - Mercator (54)	2448	32	2448	40
	Doel - Zandvliet (25)	2349	11	2349	24
	Mercator - Horta (73)	2569	15	2569	27
	Courcelles - Gramme (31)	2345	43	2349	45
	Mercator - Rodenhuize/Horta (74)	2345	16	2349	30
RTE	Attaques - Warande 2	3780	53	3780	56
	Avelin - Gavrelle	2622	28	2622	43
	Avelin - Warande	3458	14	3458	10
	Lonny - Seuil	4149	17	4149	23
	Mandarins - Warande 1	3780	50	3780	53
	Muhlbach - Scheer	2598	28	2598	21
	Revigny - Vigy	2596	24	2596	34
	Warande - Weppes	3458	19	3458	16



X < 50 % of I_{max}

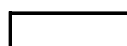


50 ≤ X < 75 % of I_{max}



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	37	2520	36
		Hagenwerder - Mikulowa (567)	2520	24	2520	22
		Hagenwerder - Mikulowa (568)	2520	24	2520	22
		Remptendorf - Redwitz (413)	3529	53	3529	57
		Remptendorf - Redwitz (414)	3529	53	3529	57
		Röhrsdorf - Hradec (445)	2520	47	2520	48
		Röhrsdorf - Hradec (446)	2520	61	2520	48
		Vieselbach - Mecklar (449-1)	2520	37	2520	36
		Wolmirstedt - Helmstedt (491-1)	2400	24	2400	20
		Wolmirstedt - Helmstedt (492-2)	2400	24	2400	20
	220 kV	Vierraden - Krajnik (507)	1361	0	1361	0
		Vierraden - Krajnik (508)	1361	0	1361	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	2	2
		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	
No constraints detected											

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 DE / Amprion	08:30 - 21:30	400	T-line Diele Niederling -Meppen			112%	400	Dörpen West	Hanekenfahr		19:30
		Note: No cascading impact after losing the line									

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	Eeklo	Busbar		153%	150	Bruegel	Eeklo	117	(07:30 -19:30) Max at 13:30
380	Avelgem	Busbar	1	102%	150	Beveren	Rumbeke	361	(10:30 -17:30 - 18:30) Max at 17:30
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): **05:30**
- Peak period (07:00 – 23:00): **08:30**

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 : **113 MW**
- PST of Lienz adapted to **200 MW**
- PST of Camporosso adapted to **200 MW**
- PSTs of Rondissone by-passed

Peak:

- SI → IT physical flow adapted to the target flow : **1050 MW (1200 MW not possible due to, after contingency, constraints at Divaca PST after.**
- Mendrisio-Cagno flow adapted to the schedule : **194 MW**
- PST of Lienz adapted to **200 MW**
- PST of Camporosso adapted to **200 MW**
- PSTs of Rondissone adapted to **maximum tap**

Special topologies

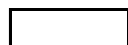
Nodes in South area				
			Off Peak	Peak
380 kV	Swissgrid	Sils	1	1
		Robbia	2	2
	Rte	Génissiat	1	1
		Albertville	2	2
		Grande Ile	1	1
	Terna	Turbigo	1	1
		Baggio	1	1
		Bovisio	2	2
		Ostiglia	1	1

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	39	2370	56
		Albertville - Rondissone 2	2370	38	2370	59
		Bulciago - Soazza	2300	6	2300	13
		Cagno - Mendrisio	855	20	855	36
		Musignano - Lavorgo	2270	53	2270	71
		Redipuglia - Divaca	2700	33	2700	46
		Robbia - San Fiorano	2530	36	2530	54
		Robbia - Gorlago	2530	43	2530	67
		Venaus - Villarodin	2715	48	2715	49
	220 kV	Airolo - Ponte	900	11	900	7
		Lienz - Soverzene	750	67	750	66
		Menton - Campo Rosso	1165	43	1165	39
		Padriciano - Divaca	960	43	960	49
		Riddes - Avise	1010	22	1010	31
		Riddes - Valpelline	1010	26	1010	36
		Serra - Pallanzeno	900	29	900	55

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	2350	2744	204	791
	Compensation ratio (calculated from NTC)	39%	49%	4%	8%
	Pentalateral impact on physical flows	-28%	-54%	-4%	-15%
Peak	Initial physical flows on adapted base case	2944	4178	197	1040
	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 / Terna	380	Albertville	Rondissone	N-K	106%	380	La Praz	PST	
		Curative action: Increase 5 taps (1 to 6) on La Praz PST => 99% remaining								
	Terna / ELES / APG / SWG	380	Sils - Filisur Robbia - Pradella - Sils		N-K	107%	220	Lienz	Soverzene	
		Curative action: Decrease 2 taps at Lienz PST (11 -> 9) => 94% remaining								
	Terna / ELES / APG	380	Redipuglia ATD		N-K	120%	220	Lienz	Soverzene	
		Curative action: Decrease 4 taps at Lienz PST (11 -> 7) => 95% 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	Terna / SWG	380	Robbia - Filisur Robbia - Pradella - Sils		N-K	105%	380	Lavorgo	Musignano	
		Preventive action: Pentalateral reduction procedure between CH-IT of 400 MW => 98% remaining								
	SWG / Terna	380	Lavorgo	Musignano	N-K	108%	220	Biasca	Iragna	
		Preventive actions: Pentalateral reduction procedure between CH-IT of 600 MW + Decrease 4 taps (7 -> 3) on Lavorgo PST => 98% remaining								
	After preventive remedial actions of Lavorgo - Musignano 380kV contingency									
	RTE / Terna	380	Albertville	Rondissone	N-K	118%	380	La Praz	PST	
		Curative action: Increase 15 taps (1 to 16) on La Praz PST => 98% remaining								
	Terna / ELES / APG	380	Redipuglia ATD		N-K	125%	220	Lienz	Soverzene	
		Curative action: Decrease 4 taps at Lienz PST (-5 -> -9) => 99% 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 Pentilateral reduction).

PST	Off Peak	
	Tap position	Physical flow to Italy (MW)
La Praz (1/33)	1	897
Rondissone 1 (1/33)	N/A	Out of Service
Rondissone 2 (1/33)	N/A	Out of Service
Camporosso (-32/32)	-2	205
Lienz (-32/32)	11	207
Padriciano (1/33)	6	166
Divaca (-32/32 each)	16	627

PST	Peak	
	Tap position	Physical flow to Italy (MW)
La Praz (1/33)	1	881
Rondissone 1 (1/33)	33	900
Rondissone 2 (1/33)	33	857
Camporosso (-32/32)	-5	163
Lienz (-32/32)	-5	179
Padriciano (1/33)	12	172
Divaca (-32/32 each)	10	806

Conclusion

CWE: No critical constraint detected.

CEE: No constraint detected.

CSE: Critical constraints found due to the forced outage of Sils - Soazza 380kV . Pentalateral reduction procedure of 600MW between CH - IT needed.