

<p><b><u>CORESO Engineers</u></b></p> <p><b><u>North :</u></b> NYAZIKA Paget</p> <p><b><u>South :</u></b> BONSIR Sébastien</p>	<p><b>Day Ahead report for</b></p> <p><b>08 January 2018</b></p>
<p><b>Security Levels:</b></p> <p><b>CWE: No constraint detected.</b></p> <p><b>CEE: No critical constraint detected.</b></p> <p><b>CSE: No critical constraints detected</b></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]	10500	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]	76500	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]	48400	17:00		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]	41.701	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.

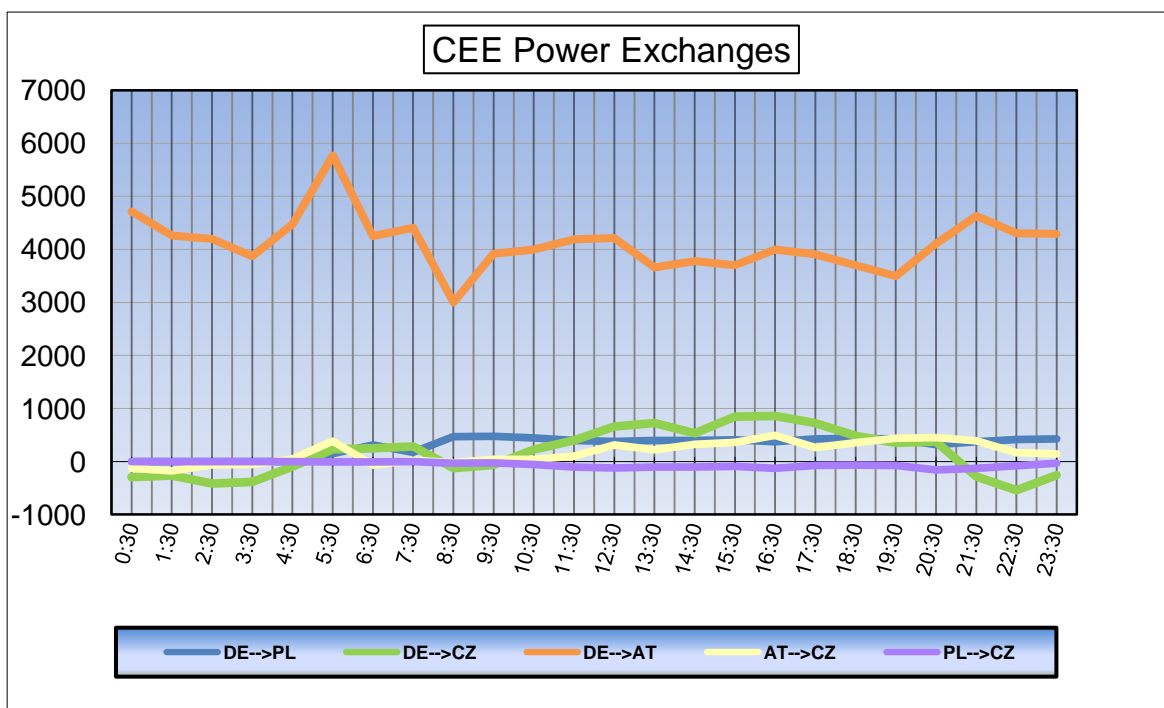
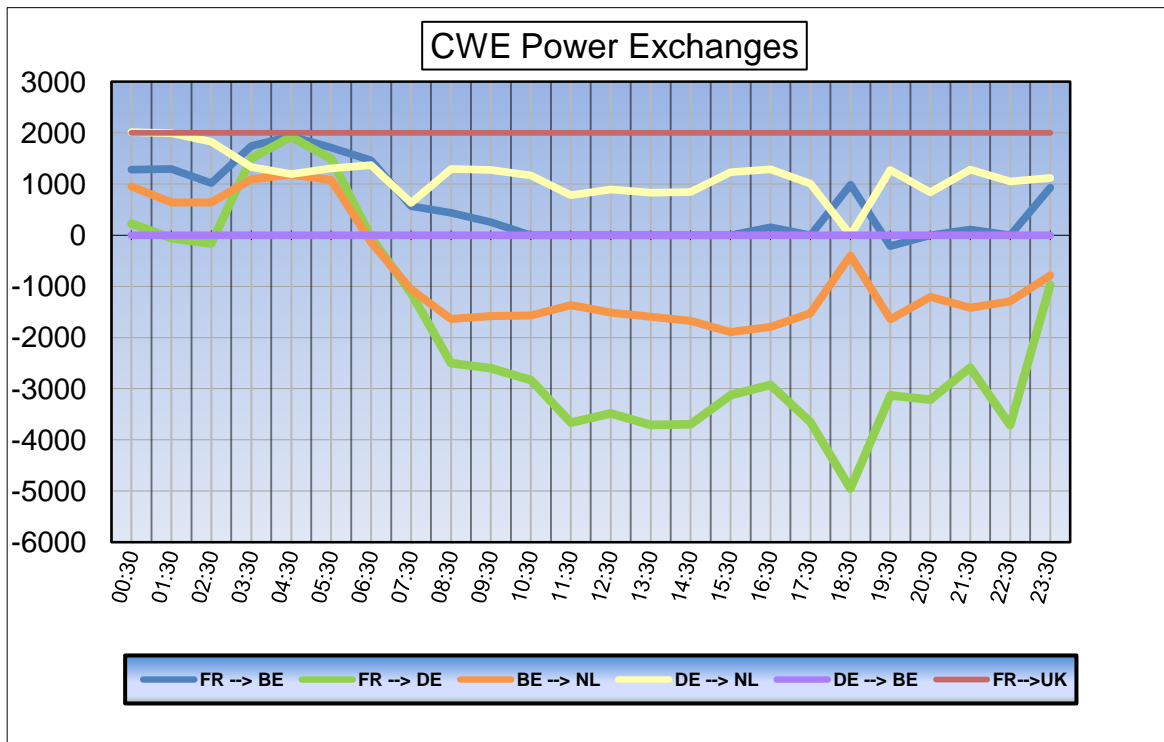
**Red:** Insufficient margin available. High risk for need of inter-TSO solicitation due to margin issues.

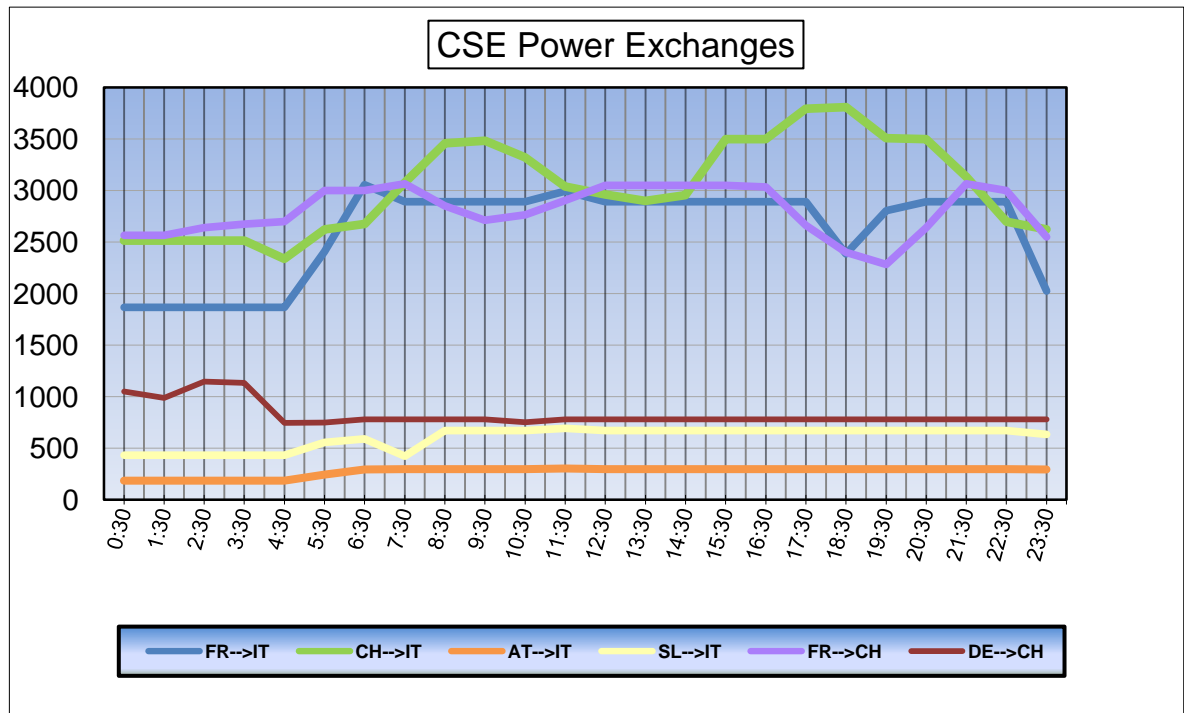
### Comments:

## 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	CROSSEN _ RÖHRSDORF 211 220 kV	08/01/2018	12/01/2018	Alternating
50HzT	Line	CROSSEN _ RÖHRSDORF 212 220 kV	08/01/2018	12/01/2018	Alternating
50HzT	Line	EULA _ Wolkramhausen 357 220 kV	06/10/2017	16/03/2018	
50HzT	Line	HAMBURG Nord _ HAMBURG Ost 961 400 kV	08/01/2018	12/01/2018	
50HzT	Line	HAMBURG Nord _ KUMMERFELD blau 380 kV	08/01/2018	08/01/2018	
50HzT	Line	LUBMIN _ LUDERSHAGEN 317-27 225 kV	08/01/2018	10/01/2018	
50HzT	Line	LUBMIN _ WIKINGER 281 220 kV	26/09/2017	31/01/2018	
50HzT	Line	RAGOW _ Förderstedt 531 400 kV	02/01/2018	14/01/2018	
50HzT	Line	RAGOW _ FORDERSTEDT 532 380 kV	02/01/2018	14/01/2018	
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	
APG	Line	TAUERN _ PST 220 kV	14/12/2017	15/01/2018	
CEPS	Line	DASNY _ KOCIN 473 400 kV	08/01/2018	26/01/2018	
CEPS / PSE	Line	BUJAKOW _ LISKOVEC 220 kV	08/01/2018	08/01/2018	
CREOS	Line	BERTRANGE _ SCHIFFLANGE West 220 kV	08/01/2018	02/03/2018	
ELES	Generation	SOSTANJ _ UNIT 6 (550MW) 400 kV	19/12/2017	08/01/2018	
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
PSE	Fossil.Gen	TUROW _ Unit 2 225 kV	01/03/2017	12/01/2018	
PSE	Line	POLANIEC _ TARNOW 400 kV	08/01/2018	12/01/2018	
PSE	Line	TUCZNAWA _ RZESZOW 400 kV	08/01/2018	12/01/2018	
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	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	FLENSBURG _ ENSTED GELB 225 kV	08/01/2018	08/01/2018	
TENNET DE	Line	TWISTETAL _ BORKEN 3 400 kV	16/05/2017	11/10/2018	
TENNET DE	Line	WURGASSEN _ GROHNDE 2 400 kV	08/01/2018	12/01/2018	
TENNET NL	Line	HENGEL _ ZWOLLE WT 400 kV	08/01/2018	12/01/2018	
TERNA	Line	PIAN CAMUNO _ S.FIORANO 358 400 kV	05/01/2018	31/01/2018	Forced outage
TransnetBW	Line	DAXLANDEN _ PHILIPPSBURG GE 400 kV	08/01/2018	12/01/2018	
TransnetBW	Line	GOLDSHOFE _ KUPFERZELL GN 400 kV	03/01/2018	10/01/2018	
TransnetBW	Line	NEUROT _ PHILIPPSBURG RT 400 kV	08/01/2018	08/01/2018	

## Exchange program forecasts





## ELIA expected flows & PSTs tap position

		Node 1	Node 2	Order	00:30	03:30	05:30	07:30	10:30	12:30	14:30	17:30	18:30	19:30	21:30	23:30
BE	FR	ACHENE	LONNY	380.19	-137	-392	-234	198	470	461	499	616	662	596	404	201
BE	FR	AUBANGE	MONT ST MARTIN	220.51	-59	-193	-117	-38	6	17	7	88	89	50	25	-73
BE	FR	AUBANGE	MOULAIN	220.51	-61	-191	-122	-43	-7	2	-3	73	73	34	15	-75
BE	FR	AVELGEM	AVELIN	380.80	-254	-590	-517	176	704	805	750	719	878	867	517	101
BE	FR	AVELGEM	MASTAING	380.79	-294	-367	-346	-117	99	132	133	100	145	143	39	-170
BE	FR	MONCEAU	CHOOZ	220.48	-175	-179	-161	-103	-56	-50	-42	-56	-55	-56	-57	-106
BE	NL	VAN EYCK 1	MAASBRACHT	380.27	-231	-52	-148	-567	-738	-735	-756	-801	-847	-829	-727	-630
BE	NL	VAN EYCK 2	MAASBRACHT	380.28	327	394	346	-245	-516	-554	-604	-522	-560	-589	-543	-302
BE	NL	ZANDVLIET	BORSSELE	380.29	-18	48	-16	-713	-1010	-1001	-1039	-1025	-1036	-931	-637	-467
BE	NL	ZANDVLIET	GEERTRUIDENBERG	380.30	513	662	556	-180	-461	-501	-538	-605	-653	-630	-493	-292
BE	LU	BELVAL	SCHIFFLANGE	220.511	57	208	125	4	-58	-83	-79	-115	-88	-91	-73	98

BE	FR	TOTAL		-980	-1912	-1497	73	1216	1367	1344	1540	1792	1634	943	-122
BE	NL	TOTAL		591	1052	738	-1705	-2725	-2791	-2937	-2953	-3096	-2979	-2400	-1691
BE	LU	TOTAL		57	208	125	4	-58	-83	-79	-115	-88	-91	-73	98
TOTAL BELGIAN IMPORT/EXPORT				-332	-652	-634	-1628	-1567	-1507	-1672	-1528	-1392	-1436	-1530	-1715

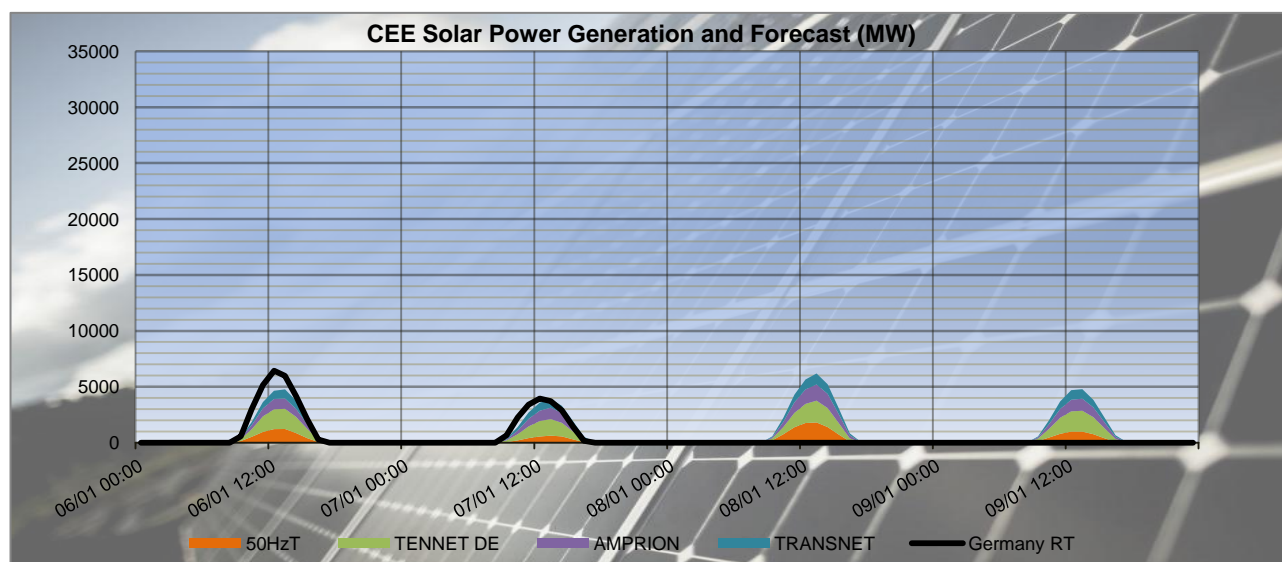
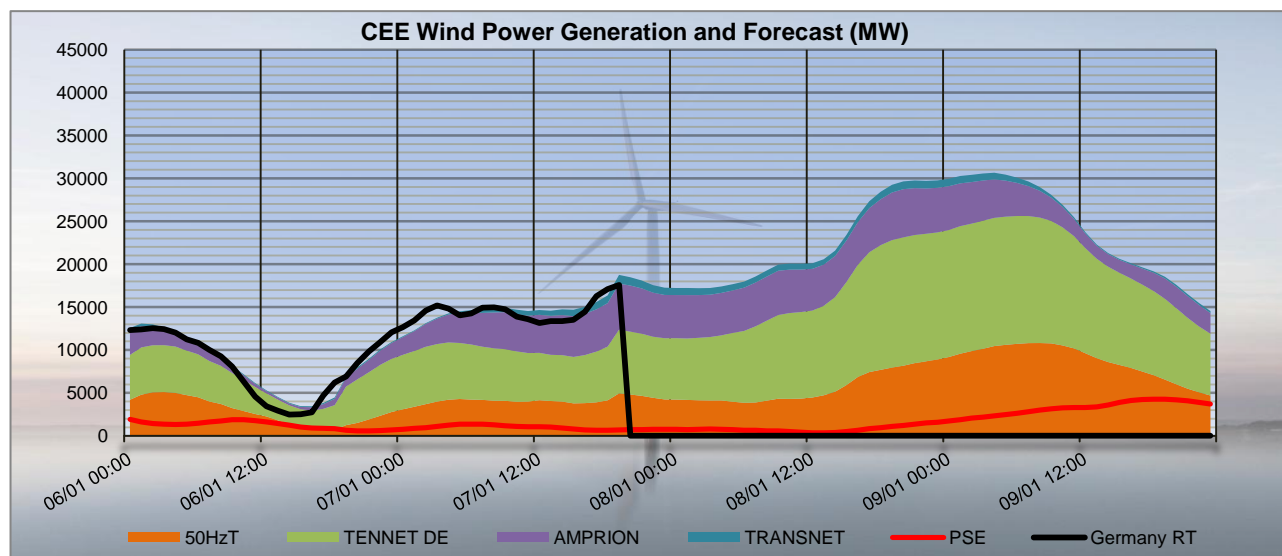
PST taps in DACF	Zandvliet 1	12	12	12	12	12	12	12	12	12	12	12	12	12
	Zandvliet 2	12	12	12	12	12	12	12	12	12	12	12	12	12
	Van Eyck 1	15	15	15	15	15	15	15	15	15	15	15	15	15
	Van Eyck 2	15	15	15	15	15	15	15	15	15	15	15	15	15
	Average	14	14	14	14	14	14	14	14	14	14	14	14	14

CREOS PST in DACF	Schiffflange	17	17	17	17	17	17	17	17	17	17	17	17	17
-------------------	--------------	----	----	----	----	----	----	----	----	----	----	----	----	----

### Proposal for real time after D-1 studies

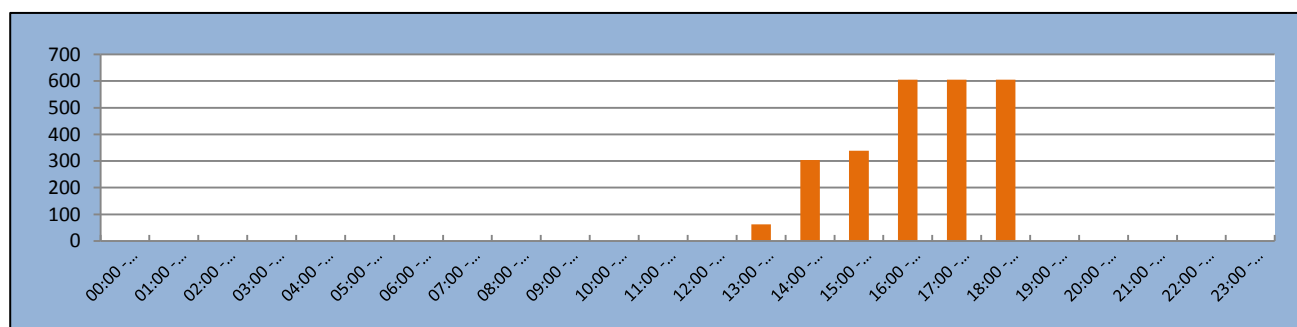
Timestamps	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
PSTs																								
Zandvliet PST 1	[1;35]	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Zandvliet PST 2	[1;35]	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Van Eyck PST 1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

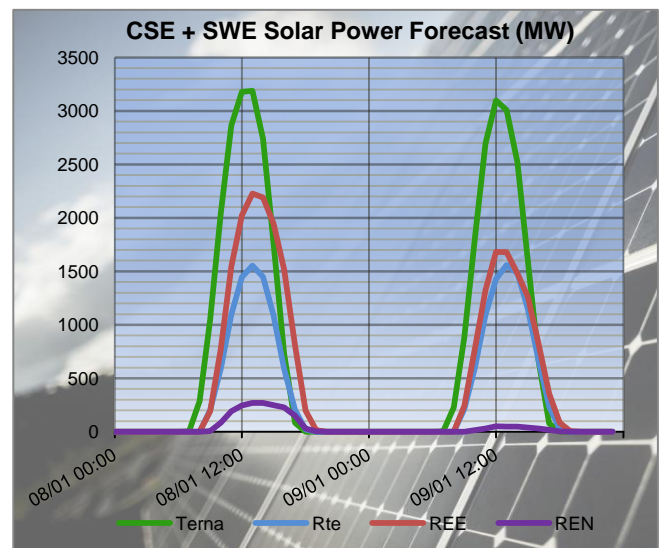
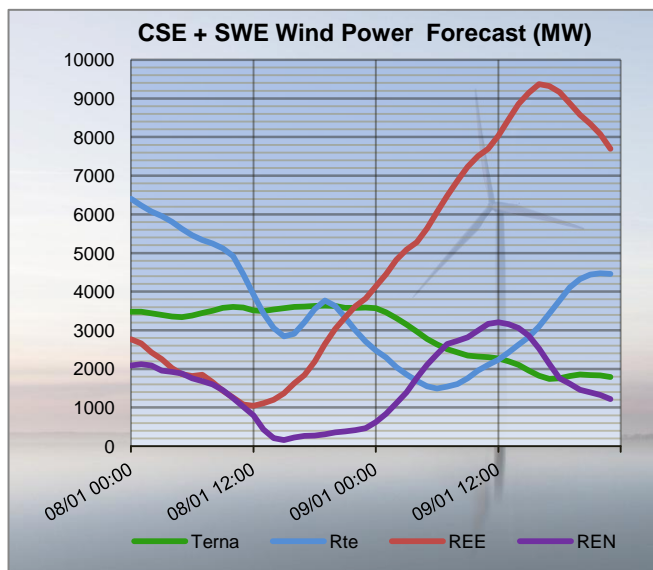
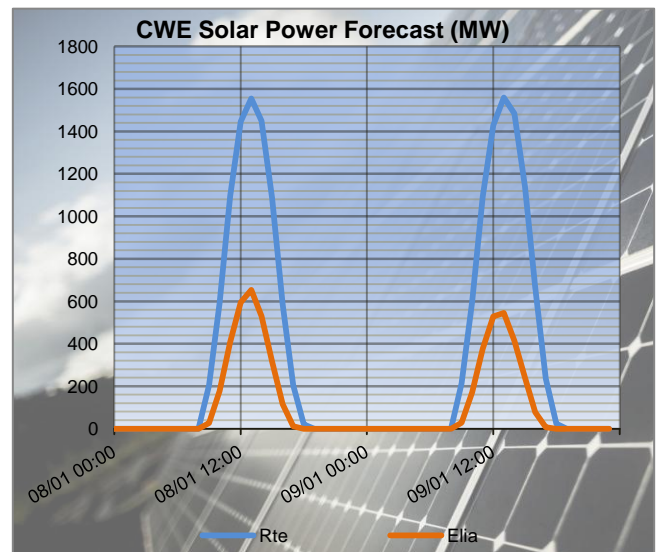
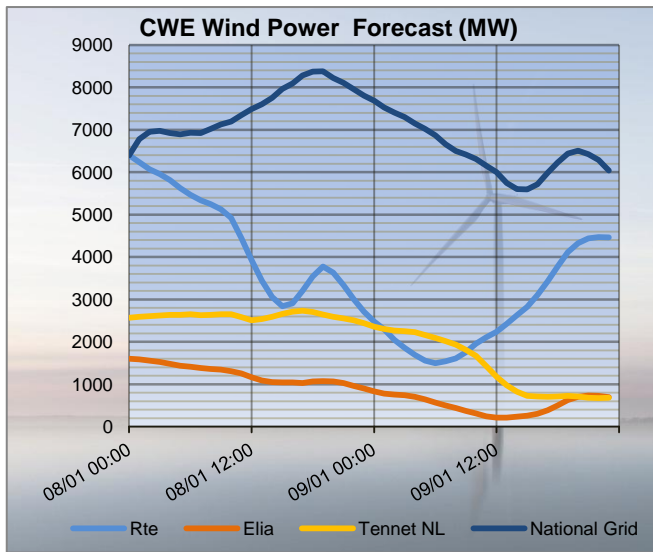


The charts above show the wind and solar generation forecasts for the TSOs in CEE (most significant) from D+1 until D-2 and the realised generation in Germany in real time. Source: Meteologica and 50HzT (RT)

## 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	324	396	72	-203	-195	8	-465	-471	-6	-461	-462	-1
FR	BE	MONT ST MARTIN	AUBANGE	60	194	134	8	38	30	14	-7	-21	-6	-18	-12
FR	BE	MOULAIN	AUBANGE	63	191	128	15	43	28	26	6	-20	8	-2	-10
FR	BE	AVELIN	AVELGEM	675	597	-78	-22	-168	-146	-509	-704	-195	-524	-806	-282
FR	BE	MASTAING	AVELGEM	449	369	-80	231	120	-111	31	-99	-130	54	-132	-186
FR	BE	CHOOZ	MONCEAU	159	180	21	141	103	-38	99	56	-43	116	50	-66
FR	DE	MUHLBACH	EICHSTETTEN	602	668	66	376	551	175	68	322	254	19	310	291
FR	DE	VOGELGRUN	EICHSTETTEN	77	107	30	49	103	54	-3	58	61	3	49	46
FR	DE	ST AVOLD	ENSDORF	0	0	0	0	0	0	0	0	0	0	0	0
FR	DE	VIGY	ENSDORF 1	695	753	58	198	330	132	17	100	83	28	54	26
FR	DE	VIGY	ENSDORF 2	500	567	67	185	348	163	75	190	115	77	137	60

				17:30			19:30			23:30		
		Node 1	Node 2	DACF	Merge	Delta	DACF	Merge	Delta	DACF	Merge	Delta
FR	BE	LONNY	ACHENE	-485	-616	-131	-327	-597	-270	-103	-203	-100
FR	BE	MONT ST MARTIN	AUBANGE	37	-89	-126	28	-50	-78	29	72	43
FR	BE	MOULAIN	AUBANGE	47	-73	-120	39	-35	-74	33	74	41
FR	BE	AVELIN	AVELGEM	-578	-717	-139	-664	-868	-204	104	-103	-207
FR	BE	MASTAING	AVELGEM	-18	-100	-82	-24	-144	-120	305	169	-136
FR	BE	CHOOZ	MONCEAU	80	56	-24	104	56	-48	171	106	-65
FR	DE	MUHLBACH	EICHSTETTEN	-46	330	376	-140	271	411	153	378	225
FR	DE	VOGELGRUN	EICHSTETTEN	-21	62	83	-36	42	78	36	74	38
FR	DE	ST AVOLD	ENSDORF	0	0	0	0	0	0	0	0	0
FR	DE	VIGY	ENSDORF 1	-29	-19	10	-64	-53	11	328	309	-19
FR	DE	VIGY	ENSDORF 2	13	67	54	-36	16	52	289	289	0

				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	446	341	-105	332	297	-35	153	134	-19	97	150	53
FR	CH	MAMBELIN	BASSECCOURT	76	112	36	-83	-15	68	-255	-161	94	-282	-163	119
FR	CH	SIERENTZ	BASSECCOURT	298	303	5	381	383	2	372	431	59	421	463	42
FR	CH	BOIS TOLLOT	ROMANEL	221	161	-60	168	193	25	44	84	40	77	81	4
FR	CH	SIERENTZ	LAUFENBURG	369	378	9	223	282	59	137	136	-1	50	185	135
FR	CH	CORNIER	RIDDES	15	70	55	18	69	51	-41	17	58	-42	10	52
FR	CH	CORNIER	ST TRIPHON	5	41	36	3	44	41	-81	-11	70	-86	-23	63
FR	CH	PRESSY	VALLORCINES	-68	-6	62	-52	9	61	-143	-62	81	-149	-77	72
FR	CH	BOIS TOLLOT	VERBOIS	116	177	61	169	178	9	119	200	81	157	218	61
FR	CH	GENISSIAT	VERBOIS	191	209	18	184	190	6	123	171	48	145	176	31
FR	CH	GENISSIAT	VERBOIS	191	209	18	184	190	6	123	171	48	145	176	31
FR	IT	ALBERTVILLE	RONDISSONE	913	718	-195	1067	821	-246	1045	873	-172	954	826	-128
FR	IT	ALBERTVILLE	RONDISSONE	914	685	-229	1067	804	-263	1045	830	-215	955	797	-158
FR	IT	MENTON	CAMPOROSSO	247	160	-87	147	150	3	142	159	17	144	141	-3
FR	IT	VILLARODIN	VENAUS	70	209	139	412	543	131	440	406	-34	324	325	1

				17:30			19:30			23:30		
		Node 1	Node 2	DACF	Merge	Delta	DACF	Merge	Delta	DACF	Merge	Delta
FR	CH	SIERENTZ	ASPHARD	48	131	83	11	90	79	160	157	-3
FR	CH	MAMBELIN	BASSECCOURT	-338	-263	75	-324	-256	68	-139	-103	36
FR	CH	SIERENTZ	BASSECCOURT	428	409	-19	403	367	-36	326	332	6
FR	CH	BOIS TOLLOT	ROMANEL	40	74	34	11	26	15	120	162	42
FR	CH	SIERENTZ	LAUFENBURG	-11	111	122	-72	122	194	120	219	99
FR	CH	CORNIER	RIDDES	-70	-10	60	-59	-4	55	-18	38	56
FR	CH	CORNIER	ST TRIPHON	-93	-37	56	-83	-26	57	-49	19	68
FR	CH	PRESSY	VALLORCINES	-162	-100	62	-131	-76	55	-106	-31	75
FR	CH	BOIS TOLLOT	VERBOIS	179	202	23	161	194	33	118	161	43
FR	CH	GENISSIAT	VERBOIS	159	174	15	130	148	18	134	163	29
FR	CH	GENISSIAT	VERBOIS	159	174	15	130	148	18	134	163	29
FR	IT	ALBERTVILLE	RONDISSONE	949	824	-125	931	868	-63	912	839	-73
FR	IT	ALBERTVILLE	RONDISSONE	950	780	-170	931	825	-106	913	809	-104
FR	IT	MENTON	CAMPOROSSO	148	144	-4	153	156	3	155	144	-11
FR	IT	VILLARODIN	VENAUS	329	392	63	422	532	110	208	295	87

## N state flows at 10:30 and 19:30

The I<sub>max</sub> and load values in the table below are extracted from the merged TSOs' DACF.

TSO	Line (380 kV)	10:30		19:30	
		I <sub>max</sub> (A)	% of I <sub>max</sub>	I <sub>max</sub> (A)	% of I <sub>max</sub>
ELIA	Champion - Gramme (32)	2448	40	2448	45
	Doel - Mercator (51)	2239	44	2239	45
	Doel - Mercator (52)	2239	44	2239	45
	Doel - Mercator (54)	2448	44	2448	45
	Doel - Zandvliet (25)	2349	30	2349	32
	Mercator - Horta (73)	2569	38	2569	46
	Courcelles - Gramme (31)	2348	45	2349	50
	Mercator - Rodenhuize/Horta (74)	2349	41	2349	50
RTE	Attaques - Warande 2	3780	60	3780	61
	Avelin - Gavrelle	2622	62	2622	72
	Avelin - Warande	3458	6	3458	6
	Lonny - Seuil	4149	27	4149	29
	Mandarins - Warande 1	3780	56	3780	57
	Muhlbach - Scheer	2598	26	2598	26
	Revigny - Vigy	2596	46	2596	49
	Warande - Weppes	3458	11	3458	10



X < 50 % of I<sub>max</sub>

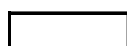


50 ≤ X < 75 % of I<sub>max</sub>



X ≥ 75 % of I<sub>max</sub>

TSO	Voltage	Line (380 kV)	10:30		19:30	
			I <sub>max</sub> (A)	% of I <sub>max</sub>	I <sub>max</sub> (A)	% of I <sub>max</sub>
50 HzT	380 kV	Eisenach - Mecklar (450-2)	2520	35	2520	34
		Hagenwerder - Mikulowa (567)	2520	23	2520	25
		Hagenwerder - Mikulowa (568)	2520	23	2520	24
		Remptendorf - Redwitz (413)	3440	56	3462	58
		Remptendorf - Redwitz (414)	3440	56	3462	58
		Röhrsdorf - Hradec (445)	2520	45	2520	44
		Röhrsdorf - Hradec (446)	2520	45	2520	44
		Vieselbach - Mecklar (449-1)	2520	35	2520	33
		Wolmirstedt - Helmstedt (491-1)	2400	3	2400	12
		Wolmirstedt - Helmstedt (492-2)	2400	3	2400	12
	220 kV	Vierraden - Krajnik (507)	1370	0	1370	0
		Vierraden - Krajnik (508)	1370	0	1370	0



X < 50 % of I<sub>max</sub>



50 ≤ X < 75 % of I<sub>max</sub>



X ≥ 75 % of I<sub>max</sub>

## 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	

### 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	
DE	10-22hr	400	Hanekefahr	Meppen		125%	400	Hanekefahr	Doppen West		19:30
To be solved by local wind curtailment in real time (Amprion)											

### 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	
No constraints detected.									

## 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): **13:30**

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 : **161 MW**
- PST of Lienz adapted to **150 MW**
- PST of Camporosso adapted to **150 MW**

### Peak:

- SI → IT physical flow adapted to the target flow : **800 MW**
- Mendrisio-Cagno flow adapted to the schedule : **141 MW**
- PST of Lienz adapted to **150 MW**
- PST of Camporosso adapted to **150 MW**

## Special topologies

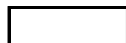
Nodes in South area				
			Off Peak	Peak
380 kV	Swissgrid	Sils	1	1
		Robbia	2	2
	Rte	Génissiat	1	1
		Albertville	1	1
		Grande Ile	2	2
	Terna	Turbigo	1	1
		Baggio	1	1
		Bovisio	1	1
		Ostiglia	1	1

## N state flows Off-Peak & Peak

The I<sub>max</sub> and load values in the table below are extracted from the **adapted** merged TSOs' DACF.

TSO	Voltage	Line (380 kV)	Off Peak		Peak	
			I <sub>max</sub> (A)	% of I <sub>max</sub>	I <sub>max</sub> (A)	% of I <sub>max</sub>
Terna	380 kV	Albertville - Rondissone 1	2370	62	2370	50
		Albertville - Rondissone 2	2370	62	2370	50
		Bulciago - Soazza	2300	23	2300	45
		Cagno - Mendrisio	855	27	855	26
		Musignano - Lavorgo	2270	41	2270	56
		Redipuglia - Divaca	2700	39	2700	39
		Robbia - San Fiorano	2530	24	2530	33
		Robbia - Gorlago	2530	28	2530	58
		Venaus - Villarodin	2715	19	2715	16
	220 kV	Airolo - Ponte	900	8	900	7
		Lienz - Soverzene	750	51	750	52
		Menton - Campo Rosso	1165	30	1165	35
		Padriciano - Divaca	960	20	960	16
		Riddes - Avise	1010	28	1010	27
		Riddes - Valpelline	1010	30	1010	29
		Serra - Pallanzeno	900	30	900	26

For Terna:



X < 50 % of I<sub>max</sub>



50 ≤ X < 75 % of I<sub>max</sub>



X ≥ 75 % of I<sub>max</sub>

### 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	2429	2445	155	794
	Compensation ratio (calculated from NTC)	37%	51%	4%	9%
	Pentalateral impact on physical flows	-25%	-57%	-4%	-14%
Peak	Initial physical flows on adapted base case	2069	3718	157	793
	Compensation ratio (calculated from NTC)	37%	50%	4%	9%
	Pentalateral impact on physical flows	-26%	-56%	-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	RTE	400	Albertville	Grande Ile	N-2	98% (1')	400	Albertville	Grande Ile	3
		<b>Preventive action:</b> Increase 7 taps (17 to 24) on La Praz PST => <b>102% (10')</b> remaining <b>Curative action:</b> 2 nodes in Albertville 400kV (isolate busbar 2A) => <b>80% (20')</b> remaining								
	RTE	400	Albertville	Busbar	1A	103% (20')	220	Albertville	Longefan	2
		<b>Curative action:</b> Increase 3 taps (24 to 27) on La Praz PST => <b>98% (20')</b> remaining <b>Note :</b> Thermal monitoring (Night thresholds) can also help to solve this constraint								
	Terna / Eles / APG	400	ATD	Redipuglia-Divaca	N-K	102%	220	Lienz	Soverzene	
<b>Curative action:</b> Decrease 1 tap on Lienz PST (from 13 to 12) => <b>96% remaining</b>										
No more constraints detected with preventive actions mentioned above										

## 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 / Eles / APG	400	ATD	Redipuglia-Divaca	N-K	104%	220	Lienz	Soverzene	
<b>Curative action:</b> Decrease 1 tap on Lienz PST (from -5 to -6) => <b>97% remaining</b>										

### Final PSTs settings

The tables below present the tap positions and the physical flows on different PSTs with the adaptations

PST	Off Peak	
	Tap position	Physical flow to Italy (MW)
La Praz (1/33)	24	191
Rondissone 1 (1/33)	33	997
Rondissone 2 (1/33)	33	997
Camporosso (-32/32)	6	154
Lienz (-32/32)	13	159
Padriciano (1/33)	3	66
Divaca (-32/32 each)	27	736

PST	Peak	
	Tap position	Physical flow to Italy (MW)
La Praz (1/33)	17	308
Rondissone 1 (1/33)	33	794
Rondissone 2 (1/33)	33	794
Camporosso (-32/32)	1	159
Lienz (-32/32)	-5	159
Padriciano (1/33)	23	59
Divaca (-32/32 each)	-3	737

## Conclusion

CWE: No constraint detected.

CEE: No critical constraint detected.

CSE: No critical constraints detected