CORESO Engineers ***North :*** EL JAFOUFI Mohamed ***South :*** SCHÜLKE Arnaud	**Day Ahead report for** **11 February 2018**

Security Levels:

CWE: No critical constraint detected.

CEE: No critical constraint detected.

CSE: No critical constraint detected.

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]	8500	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	**1**	2300
						900	2	
				Schw. Pumpe		800	2	1600
				Lippendorf		920	2	1840
RTE			RTE	Gravelines	Pmax (MW)	900	6	5400
Peak load [MW]	71800	13:00		Chooz		1500	2	3000
Generation Margin	Sufficient			Cattenom		1300	4	5200
				Fessenheim		900	**1**	900
NATIONAL GRID (UK time)				Penly		1300	2	2600
Peak load [MW]	43400	17:50		Paluel		1300	**3**	3900
Generation Margin	Sufficient			Nogent s/ Seine		1300	2	2600
				Bugey		900	4	3600
TERNA				St Alban		1300	**1**	1300
Peak load [MW]	34893	19:30		Cruas		900	**3**	2700
Generation Margin	Sufficient			Tricastin		900	4	3600

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

Model improvements on Meeden PSTS:
- from 01:00 to 05:00: tap -1
- from 05:00 to 08:00: tap -2
- from 09:00 to 24:00: tap +1

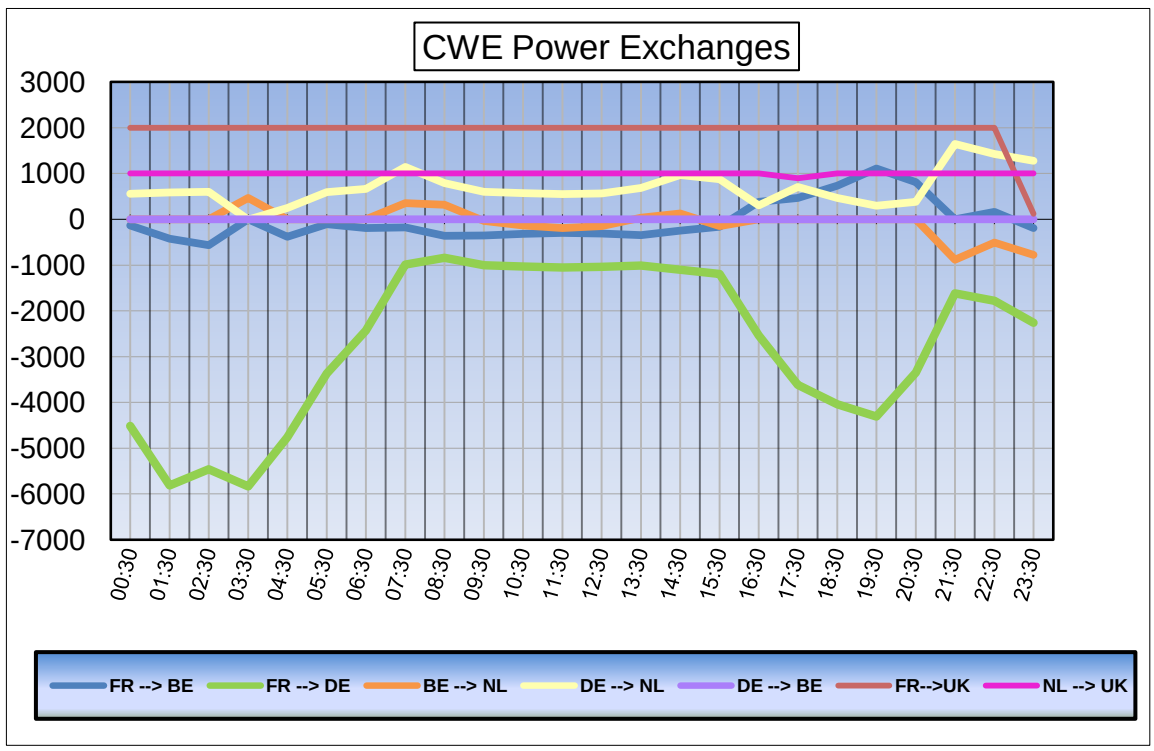
CSE

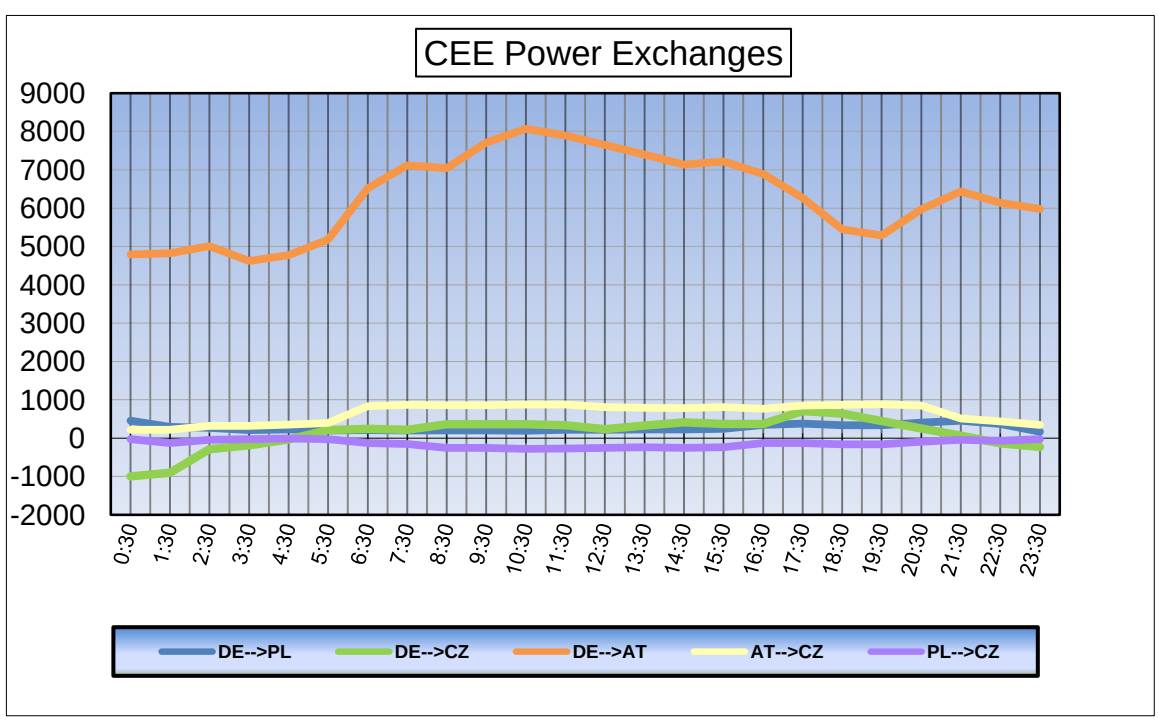
Swissgrid: Mendrisio PST is not modelled correctly: could not perform flow regulation

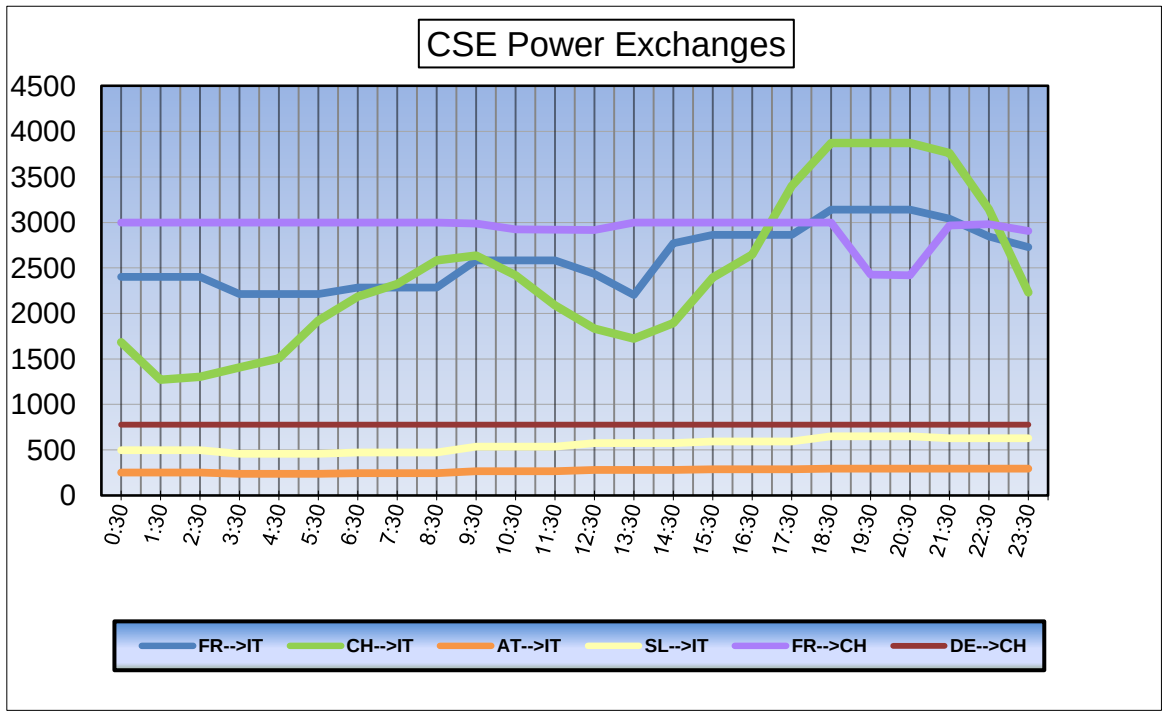
Outages table

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	04/02/2018	11/02/2018	
50HzT	Line	HAMBURG Nord _ BRUNSBUTTEL 951 400 kV	04/02/2018	11/02/2018	
50HzT	Line	RAGOW _ THYROW 522 400 kV	05/02/2018	16/02/2018	
50HzT	Line	REMPTENDORF _ VIESELBACH 416 400 kV	05/02/2018	11/02/2018	permanently
50HzT / PSE	Line	KRAJNIK _ VIERRADEN 507 225 kV	22/06/2016	31/05/2018	long term outage
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	NOSOVICE _ 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	GEZELLE _ STEVIN 112 400 kV	19/09/2017	02/03/2018	permanently
ELIA	Nuc.Gen	DOEL _ Unit 3 (1000MW) 400 kV	23/09/2017	16/04/2018	forced outage
PSE	Line	LESNIOW _ MIKULOWA 220 kV	09/02/2018	11/02/2018	Permanently
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	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	LIMMERN _ TIERFEHD 1 400 kV	28/01/2018	08/06/2018	
S.GRID	Nuc.Gen	BEZNAU _ BEZNAU G11 220 kV	13/03/2015	28/02/2018	182 MW
S.GRID	Nuc.Gen	BEZNAU _ BEZNAU G12 220 kV	13/03/2015	28/02/2018	182 MW
S.GRID	Transformer	BASSECOURT _ Transformer 400 kV	13/12/2017	31/03/2018	Trfo 32
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	TWISTETAL _ BORKEN 3 400 kV	16/05/2017	11/10/2018	
TENNET NL	Line	ENS _ ZWOLLE WT 400 kV	10/02/2018	16/02/2018	
TERNA	Line	BOVISIO _ CISLAGO 309 400 kV	11/02/2018	11/02/2018	
TERNA	Line	PLANAIS _ UDINE OVEST 321 400 kV	30/01/2018	13/02/2018	
TransnetBW	Line	BUNZWANGEN _ LAICHINGEN Grün 380 kV	01/01/2018	24/02/2018	
TransnetBW	Line	BUNZWANGEN _ LAICHINGEN Grün 380 kV	05/02/2018	24/02/2018	

Exchange program forecasts






CSE Power Exchanges
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0:30
1:30
2:30
3:30
4:30
5:30
6:30
7:30
8:30
9:30
10:30
11:30
12:30
13:30
14:30
15:30
16:30
17:30
18:30
19:30
20:30
21:30
22:30
23:30
FR-->IT
CH-->IT
AT-->IT
SL-->IT
FR-->CH
DE-->CH

ELIA expected flows & PSTs tap position

		Node 1	Node 2	Order	00:30	01:30	03:30	07:30	10:30	11:30	12:30	14:30	17:30	19:30	21:30	23:30
BE	FR	ACHENE	LONNY	380.19	572	703	552	316	386	394	393	334	432	467	350	388
BE	FR	AUBANGE	MONT ST MARTIN	220.51	186	199	196	76	106	95	88	103	142	140	92	95
BE	FR	AUBANGE	MOULAINE	220.51	167	182	181	62	95	89	81	95	125	125	75	92
BE	FR	AVELGEM	AVELIN	380.80	542	685	535	129	322	313	280	121	213	392	188	153
BE	FR	AVELGEM	MASTAING	380.79	85	225	196	-28	-16	-15	-19	-64	-49	-27	-84	-67
BE	FR	MONCEAU	CHOOZ	220.48	-27	5	6	-39	-58	-55	-53	-58	-54	-74	-82	-61
BE	NL	VAN EYCK 1	MAASBRACHT	380.27	-516	-540	-406	-238	-358	-371	-353	-270	-492	-636	-512	-482
BE	NL	VAN EYCK 2	MAASBRACHT	380.28	-318	-398	-349	29	-63	-91	-75	49	-256	-434	-287	-266
BE	NL	ZANDVLIET	BORSSELE	380.29	-349	-365	-312	-125	-261	-279	-268	-188	-380	-623	-530	-306
BE	NL	ZANDVLIET	GEERTRUIDENBERG	380.30	-189	-217	-107	191	-56	-87	-64	94	-147	-341	-123	-175
BE	LU	BELVAL	SCHIFFLANGE	220.511	-23	-65	-36	148	82	113	150	156	-11	-104	19	34

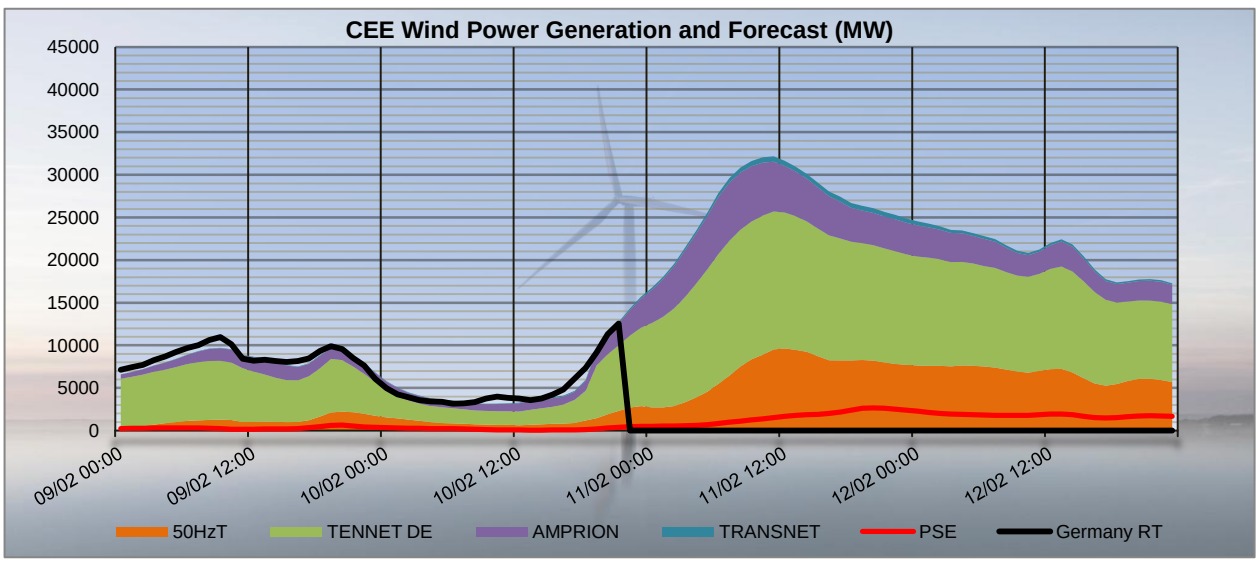
BE	FR	TOTAL		1525	1999	1666	516	835	821	770	531	809	1023	539	600
BE	NL	TOTAL		-1372	-1520	-1174	-143	-738	-828	-760	-315	-1275	-2034	-1452	-1229
BE	LU	TOTAL		-23	-65	-36	148	82	113	150	156	-11	-104	19	34
TOTAL BELGIAN IMPORT/EXPORT				130	414	456	521	179	106	160	372	-477	-1115	-894	-595

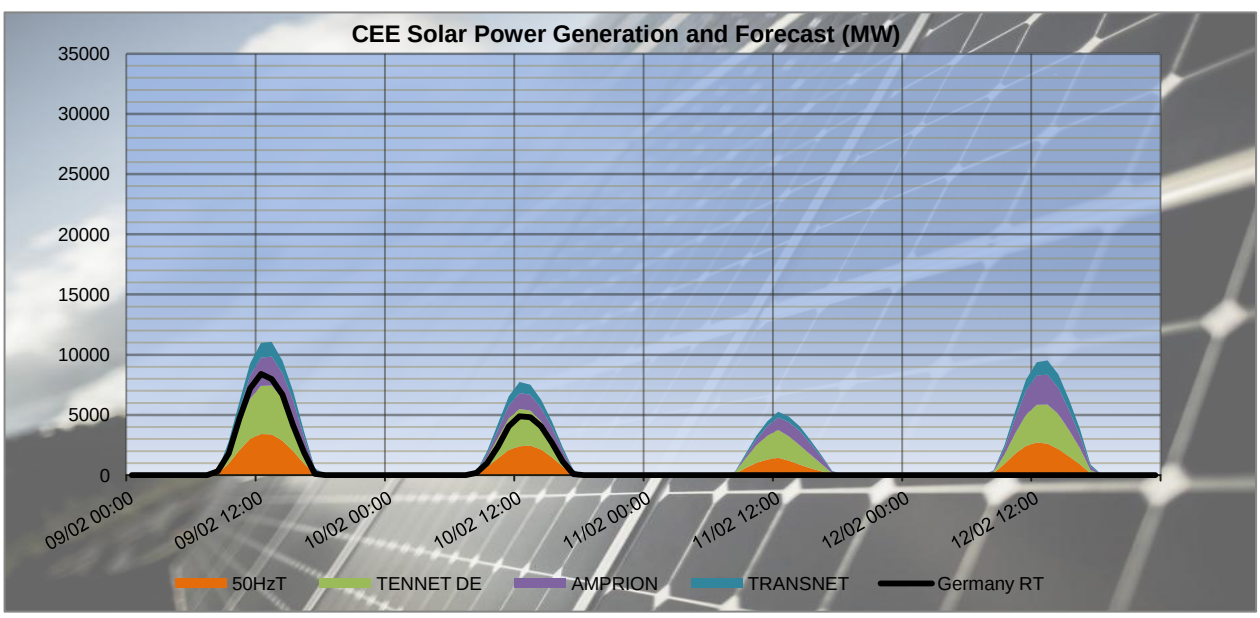
PST taps in DACF	**Zandvliet 1**	15	15	15	15	15	15	15	15	15	15	15	15	15	15
	Zandvliet 2	15	15	15	15	15	15	15	15	15	15	15	15	15	15
	Van Eyck 1	18	18	18	18	18	18	18	18	18	18	18	18	18	18
	Van Eyck 2	18	18	18	18	18	18	18	18	18	18	18	18	18	18
	Average	17	17	17	17	17	17	17	17	17	17	17	17	17	17

CREOS PST in DACF	**Schifflange**	17	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]**	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Zandvliet 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
Van Eyck PST 1	**[1;35]**	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Van Eyck PST 2	**[1;35]**	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Schifflange 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

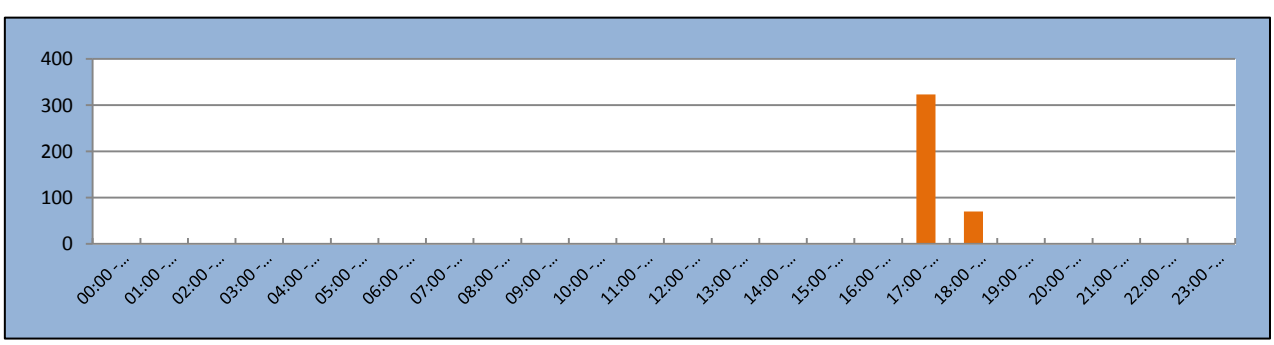
CEE Renewable Power Generation & Forecast



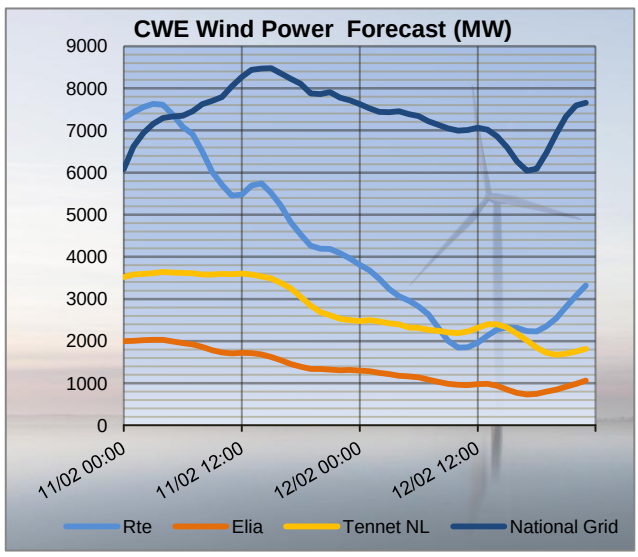


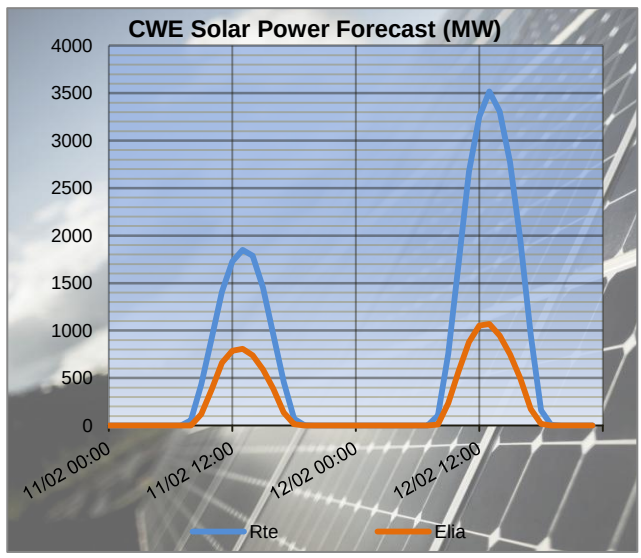
The charts above show the wind and solar generation forecasts for the TSOs in CEE (most significant) from D+1 until D-2 and the realised generation in Germany in real time. Source: Meteologica and 50HzT (RT)

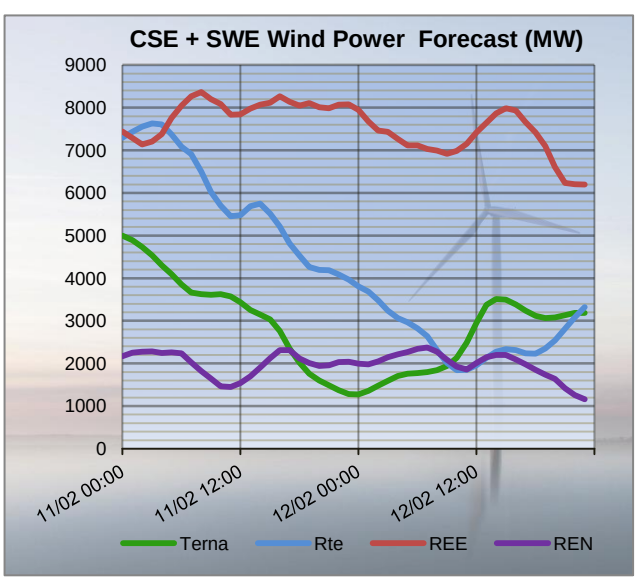
50HzT Preventive Redispatch

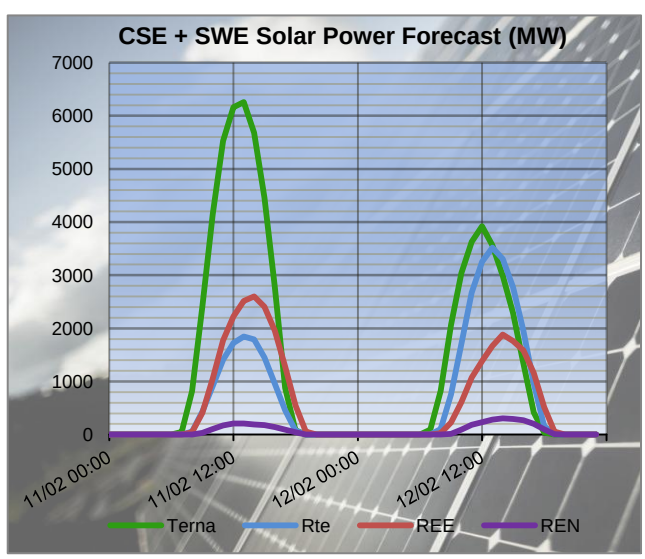


CWE, CSE & SWE Renewable Power Forecast (D-1 and D-2)









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	-434	-554	-120	-147	-343	-196	-258	-409	-151	-242	-411	-169
FR	BE	MONT ST MARTIN	AUBANGE	-159	-197	-38	-42	-84	-42	-46	-114	-68	-47	-94	-47
FR	BE	MOULAINE	AUBANGE	-145	-181	-36	-29	-70	-41	-38	-103	-65	-42	-86	-44
FR	BE	AVELIN	AVELGEM	-413	-538	-125	54	-165	-219	-199	-354	-155	-242	-306	-64
FR	BE	MASTAING	AVELGEM	-118	-198	-80	141	10	-131	89	3	-86	42	9	-33
FR	BE	CHOOZ	MONCEAU	173	-7	-180	183	34	-149	210	55	-155	212	51	-161
FR	DE	MUHLBACH	EICHSTETTEN	-170	170	**340**	395	651	**256**	382	557	175	321	514	193
FR	DE	VOGELGRUN	EICHSTETTEN	-187	-95	92	-82	-26	56	-54	-10	44	-51	-12	39
FR	DE	ST AVOLD	ENSDORF	0	0	0	0	0	0	0	0	0	0	0	0
FR	DE	VIGY	ENSDORF 1	-166	0	166	338	353	15	307	268	-39	286	292	6
FR	DE	VIGY	ENSDORF 2	-475	-269	206	325	368	43	244	226	-18	217	252	35

				17:30			19:30			23:30		
		Node 1	Node 2	DACF	Merge	Delta	DACF	Merge	Delta	DACF	Merge	Delta
FR	BE	LONNY	ACHENE	-251	-428	-177	-304	-458	-154	-258	-386	-128
FR	BE	MONT ST MARTIN	AUBANGE	-50	-141	-91	-83	-137	-54	-76	-95	-19
FR	BE	MOULAINE	AUBANGE	-37	-124	-87	-72	-122	-50	-73	-92	-19
FR	BE	AVELIN	AVELGEM	-169	-208	-39	-250	-380	-130	-72	-150	-78
FR	BE	MASTAING	AVELGEM	72	53	-19	114	34	-80	115	69	-46
FR	BE	CHOOZ	MONCEAU	224	55	-169	334	76	**-258**	315	62	**-253**
FR	DE	MUHLBACH	EICHSTETTEN	185	471	**286**	-39	344	**383**	190	401	211
FR	DE	VOGELGRUN	EICHSTETTEN	-109	-17	92	-140	-36	104	-97	-25	72
FR	DE	ST AVOLD	ENSDORF	0	0	0	0	0	0	0	0	0
FR	DE	VIGY	ENSDORF 1	30	126	96	-44	63	107	81	184	103
FR	DE	VIGY	ENSDORF 2	-74	56	130	-177	-32	145	-20	114	134

				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	89	117	28	354	371	17	285	306	21	275	296	21
FR	CH	MAMBELIN	BASSECOURT	-309	-206	103	-163	-76	87	-112	-36	76	-107	-21	86
FR	CH	SIERENTZ	BASSECOURT	753	710	-43	678	706	28	539	606	67	536	551	15
FR	CH	BOIS TOLLOT	ROMANEL	28	-113	-141	110	-27	-137	99	7	-92	159	50	-109
FR	CH	SIERENTZ	LAUFENBURG	103	252	149	263	474	211	238	389	151	158	380	222
FR	CH	CORNIER	RIDDES	-145	-74	71	-87	-24	63	-40	30	70	-37	55	92
FR	CH	CORNIER	ST TRIPHON	-155	-104	51	-94	-51	43	-58	-15	43	-34	21	55
FR	CH	PRESSY	VALLORCINES	-299	-248	51	-223	-181	42	-218	-172	46	-194	-132	62
FR	CH	BOIS TOLLOT	VERBOIS	140	194	54	166	217	51	143	188	45	184	229	45
FR	CH	GENISSIAT	VERBOIS	60	59	-1	89	91	2	110	117	7	131	135	4
FR	CH	GENISSIAT	VERBOIS	60	59	-1	89	91	2	110	117	7	131	135	4
FR	IT	ALBERTVILLE	RONDISSONE	399	173	-226	610	580	-30	736	693	-43	697	451	-246
FR	IT	ALBERTVILLE	RONDISSONE	405	-43	**-448**	636	555	-81	799	695	-104	736	330	**-406**
FR	IT	MENTON	CAMPOROSSO	249	219	-30	144	267	123	144	397	**253**	153	429	**276**
FR	IT	VILLARODIN	VENAUS	-79	177	**256**	182	319	137	520	633	113	501	800	**299**

				17:30			19:30			23:30		
		Node 1	Node 2	DACF	Merge	Delta	DACF	Merge	Delta	DACF	Merge	Delta
FR	CH	SIERENTZ	ASPHARD	236	280	44	98	143	45	214	218	4
FR	CH	MAMBELIN	BASSECOURT	-239	-152	87	-297	-200	97	-183	-118	65
FR	CH	SIERENTZ	BASSECOURT	606	629	23	518	496	-22	569	556	-13
FR	CH	BOIS TOLLOT	ROMANEL	39	-109	-148	-9	-175	-166	116	-64	-180
FR	CH	SIERENTZ	LAUFENBURG	223	256	33	40	169	129	163	287	124
FR	CH	CORNIER	RIDDES	-112	-43	69	-108	-52	56	-72	-25	47
FR	CH	CORNIER	ST TRIPHON	-145	-101	44	-116	-95	21	-83	-65	18
FR	CH	PRESSY	VALLORCINES	-288	-225	63	-250	-208	42	-226	-197	29
FR	CH	BOIS TOLLOT	VERBOIS	137	193	56	129	155	26	147	198	51
FR	CH	GENISSIAT	VERBOIS	61	61	0	86	65	-21	97	89	-8
FR	CH	GENISSIAT	VERBOIS	61	61	0	86	65	-21	97	89	-8
FR	IT	ALBERTVILLE	RONDISSONE	746	653	-93	800	721	-79	686	631	-55
FR	IT	ALBERTVILLE	RONDISSONE	793	672	-121	883	781	-102	702	611	-91
FR	IT	MENTON	CAMPOROSSO	152	241	89	159	261	102	148	233	85
FR	IT	VILLARODIN	VENAUS	340	379	39	730	800	70	481	583	102

N state flows at 10:30 and 19:30

The Imax and load values in the table below are extracted from the merged TSOs' DACF.

TSO	Line (380 kV)	10:30		19:30	
		Imax (A)	% of Imax	Imax (A)	% of Imax
ELIA	Champion - Gramme (32)	2448	32	2448	39
	Doel - Mercator (51)	2239	29	2239	38
	Doel - Mercator (52)	2239	29	2239	38
	Doel - Mercator (54)	2448	29	2448	38
	Doel - Zandvliet (25)	2349	8	2349	19
	Mercator - Horta (73)	2569	24	2569	35
	Courcelles - Gramme (31)	2281	39	2349	45
	Mercator - Rodenhuize/Horta (74)	2295	27	2349	40
RTE	Attaques - Warande 2	3780	48	3780	58
	Avelin - Gavrelle	2622	35	2622	48
	Avelin - Warande	3458	6	3458	8
	Lonny - Seuil	4149	22	4149	27
	Mandarins - Warande 1	3540	49	3540	59
	Muhlbach - Scheer	2598	39	2598	29
	Revigny - Vigy	2596	28	2596	39
	Warande - Weppes	3458	11	3458	14

X < 50 % of Imax 50 ≤ X < 75 % of Imax X ≥ 75 % of Imax

TSO	Voltage	Line (380 kV)	10:30		19:30	
			Imax (A)	% of Imax	Imax (A)	% of Imax
50 HzT	380 kV	Eisenach - Mecklar (450-2)	2520	8	2520	14
		Hagenwerder - Mikulowa (567)	2520	36	2520	34
		Hagenwerder - Mikulowa (568)	2520	36	2520	34
		Remptendorf - Redwitz (413)	3551	43	3529	46
		Remptendorf - Redwitz (414)	3551	43	3529	46
		Röhrsdorf - Hradec (445)	2520	51	2520	42
		Röhrsdorf - Hradec (446)	2520	51	2520	42
		Vieselbach - Mecklar (449-1)	2520	8	2520	15
		Wolmirstedt - Helmstedt (491-1)	2400	2	2400	2
		Wolmirstedt - Helmstedt (492-2)	2400	2	2400	2
	220 kV	Vierraden - Krajnik (507)	1370	0	1370	0
		Vierraden - Krajnik (508)	1370	0	1370	0

X < 50 % of Imax 50 ≤ X < 75 % of Imax X ≥ 75 % of Imax

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 - 04:00	380	Attaques	Warande	2	105%	380	Mandarins	Warande	1	00:30
		Curative action : 2-nodes topology in Warande 380 kV => 91 % remaining.									
50HzT	08:00 - 24:00	380	Bärwalde	Graustein	axis	125%	380	Bärwalde	Graustein	remaining	11:30
		Preventive action: 2 nodes in Bärwalde--> 88% remaining. (50HzT will do 2 nodes in Graustein)									

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	04:00 - 23:00	380	T-line Diele-Niederlangen-Meppen			111%	380	Hanekenfahr	Dorpen West		12:30
		Observability area: +9 taps in Gronau and tap +2 at Meeden --> 95% 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	
No constraint detected									

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): **02:30**
- Peak period (07:00 – 23:00): **10:30**

Adaptations made on merged DACFs:

Off-peak:

- SI ➔ IT physical flow adapted to target flow **800 MW**
- Mendrisio-Cagno flow flow: 109 MW (schedule: 86 MW)
- PST of Lienz adapted to **110 MW**
- PST of Camporosso adapted to **200 MW**
- PST of La Praz on **tap 1**

Peak:

- SI ➔ IT physical flow adapted to target flow **800 MW**
- Mendrisio-Cagno flow: 180 MW (schedule: 149 MW)
- PST of Lienz adapted to **115 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 Imax and load values in the table below are extracted from the **adapted** merged TSOs' DACF.

TSO	Voltage	Line (380 kV)	Off Peak		Peak	
			Imax (A)	% of Imax	Imax (A)	% of Imax
Terna	380 kV	Albertville - Rondissone 1	2370	9	2370	42
		Albertville - Rondissone 2	2370	3	2370	42
		Bulciago - Soazza	2300	34	2300	27
		Cagno - Mendrisio	855	19	855	30
		Musignano - Lavorgo	2270	52	2270	39
		Redipuglia - Divaca	2450	38	2450	38
		Robbia - San Fiorano	2530	31	2530	29
		Robbia - Gorlago	2530	44	2530	35
		Venaus - Villarodin	2715	15	2715	33
	220 kV	Airolo - Ponte	900	13	900	14
		Lienz - Soverzene	704	40	704	38
		Menton - Campo Rosso	1165	43	1165	42
		Padriciano - Divaca	960	40	960	41
		Riddes - Avise	1010	4	1010	14
		Riddes - Valpelline	1010	5	1010	16
		Serra - Pallanzeno	900	15	900	28

For Terna:

X < 50 % of Imax | 50 ≤ X < 75 % of Imax | X ≥ 75% of Imax

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	604	2883	114	810
	Compensation ratio (calculated from NTC)	39%	49%	4%	8%
	Pentalateral impact on physical flows	-27%	-55%	-4%	-14%
Peak	Initial physical flows on adapted base case	2162	2684	109	807
	Compensation ratio (calculated from NTC)	39%	49%	4%	8%
	Pentalateral impact on physical flows	-27%	-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 . Swissgrid	380	Robbia - Filisur	Pradella - La Punt	N-2	119%	220	Westirol	transformer	
		For info (APG does not monitor N-2 contingencies, this constraint is acceptable for the APG operator)								

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 / APG	380	Génissiat	busbar	1	129%	380/220	Bassecourt	transformer	
		Preventive action : 2 nodes in Bassecourt 380 kV and 2 nodes in Mühleberg 220 kV => 86% 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 Pentalateral reduction).

PST	Off Peak	
	Tap position	Physical flow to Italy (MW)
La Praz (1/33)	1	284
Rondissone 1 (1/33)	0	-38
Rondissone 2 (1/33)	8	156
Camporosso (-32/32)	-21	203
Lienz (-32/32)	0	115
Padriciano (1/33)	25	156
Divaca (-32/32 each)	-8	656

PST	Peak	
	Tap position	Physical flow to Italy (MW)
La Praz (1/33)	1	503
Rondissone 1 (1/33)	30	667
Rondissone 2 (1/33)	33	670
Camporosso (-32/32)	-10	198
Lienz (-32/32)	12	110
Padriciano (1/33)	6	160
Divaca (-32/32 each)	19	649

Conclusion

CWE: No critical constraint detected.
CEE: No critical constraint detected.
CSE: No critical constraint detected.