CORESO Engineers ***North :*** BRIEGERT Robin ***South :*** KESRAOUI Mickael	**Day Ahead report for** **13 January 2018**

Security Levels:

CWE: No constraint detected.

CEE: No critical constraint detected.

CSE: High flows expected from Slovenia to Italy due to the by-passed Divaca PSTs so a Pentalateral reduction may be required for evening hours if the PSTs will not be back in service at 17:00 as expected.

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]	10200	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	**5**	2500
				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]	70800	19:00		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]	42800	17:30		Paluel		1300	**3**	3900
Generation Margin	Sufficient			Nogent s/ Seine		1300	2	2600
				Bugey		900	4	3600
TERNA				St Alban		1300	2	2600
Peak load [MW]	36800	19:30		Cruas		900	**2**	1800
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

CSE

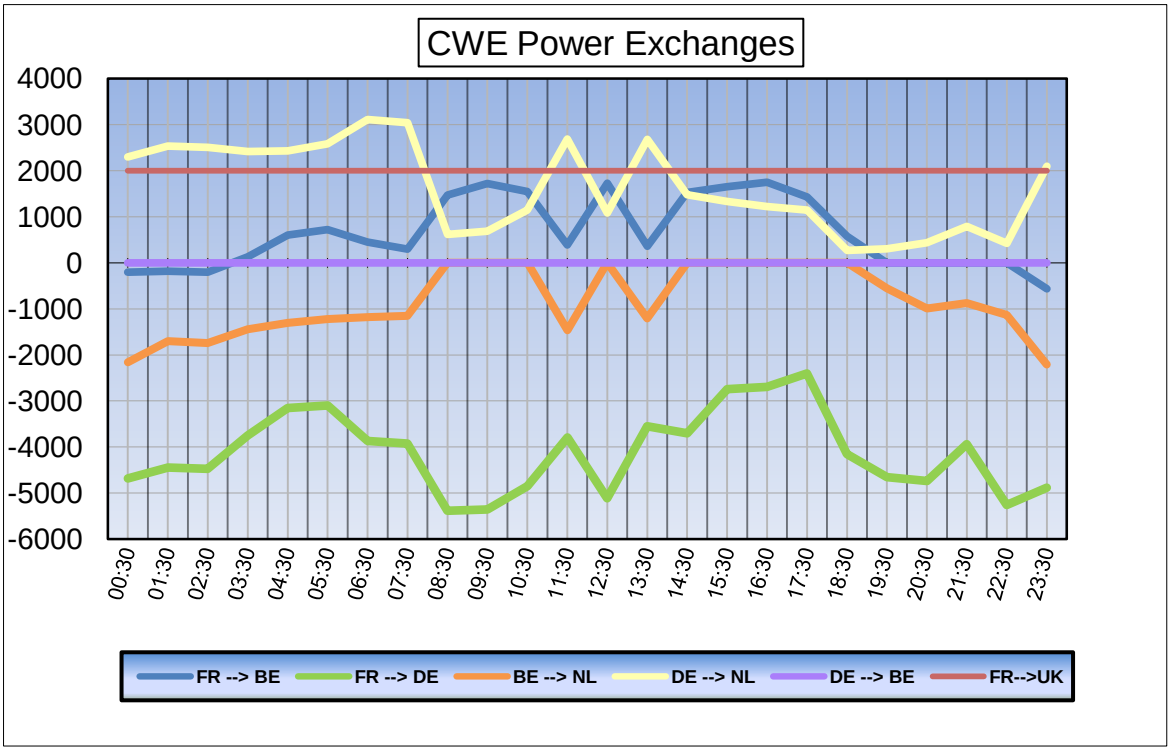
ELES: The Divaca PSTs will be by-passed until 17:00 but they are considered out of service until the end of the day to study the worst case.

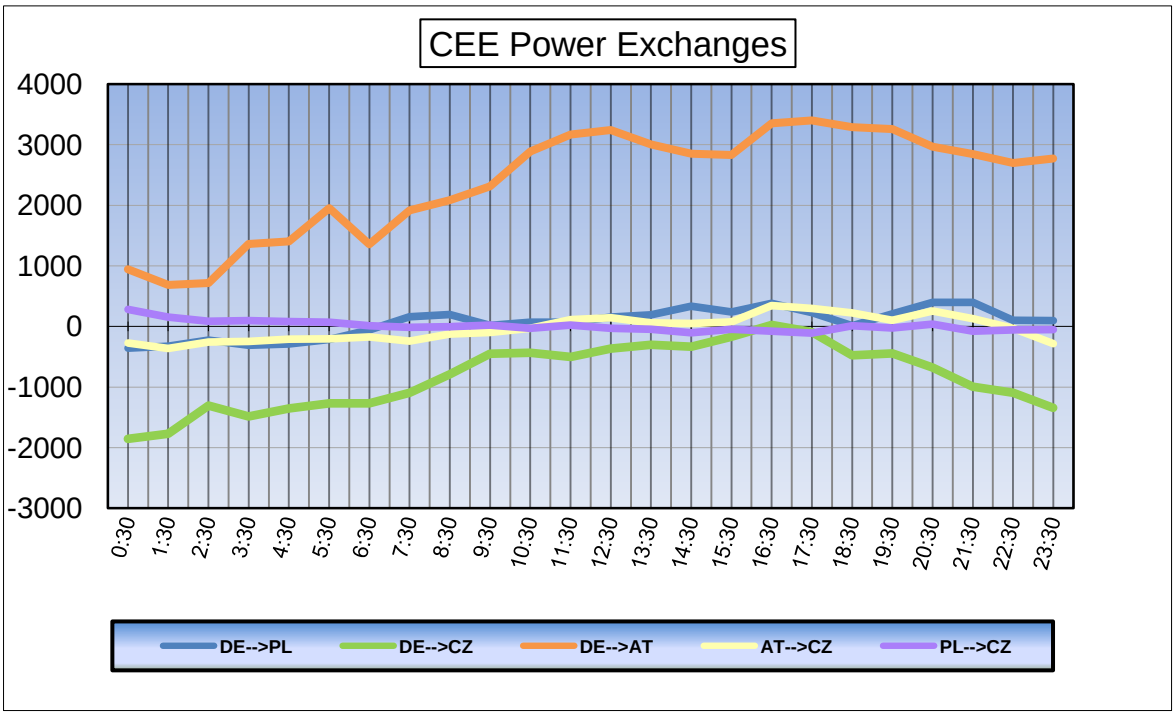
RTE: load variation of 4557MW at 2:30 during the merging process that may alter the results of the analysis.

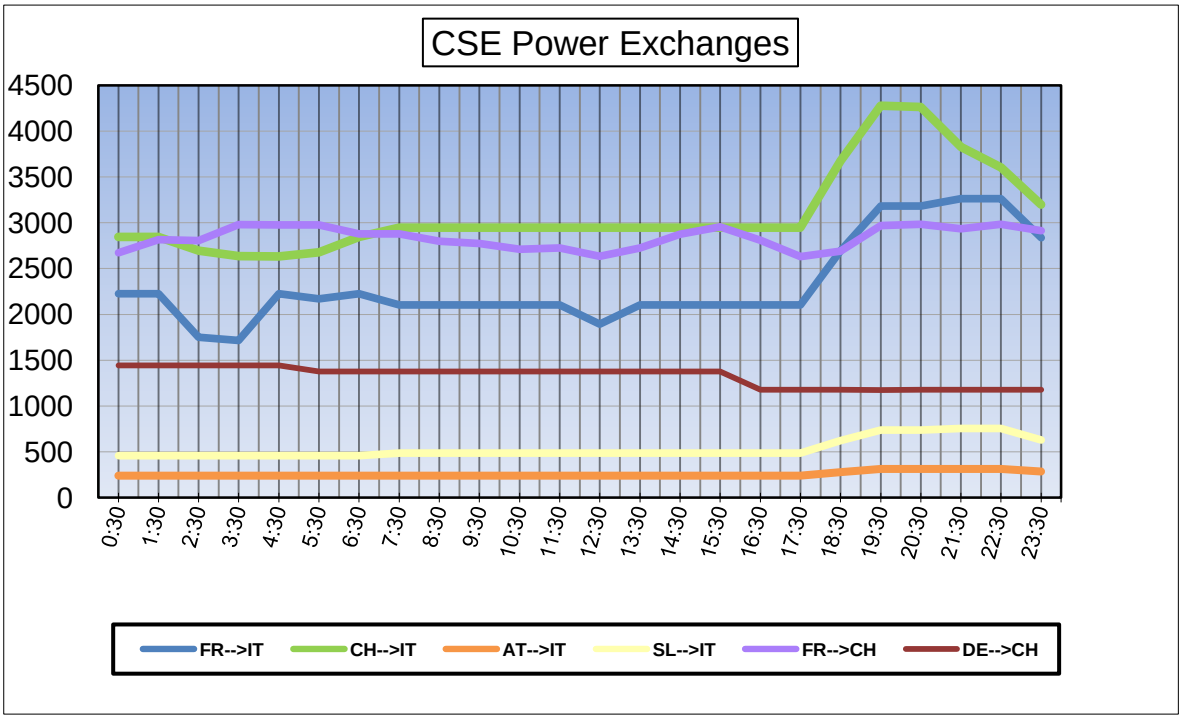
Outages table

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	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	
CREOS	Line	BERTRANGE _ SCHIFFLANGE West 220 kV	08/01/2018	02/03/2018	
ELES	PST	DIVACA _ PST 1 400 kV	10/01/2018	13/01/2018	BY PASSED
ELES	PST	DIVACA _ PST 2 400 kV	10/01/2018	13/01/2018	BY PASSED
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
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	TWISTETAL _ BORKEN 3 400 kV	16/05/2017	11/10/2018	
TENNET NL	Line	HENGELO _ ZWOLLE WT 400 kV	13/01/2018	19/01/2018	permanent
TERNA	Line	PIAN CAMUNO _ S.FIORANO 358 400 kV	05/01/2018	31/01/2018	Forced outage

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	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	448	255	236	329	452	398	365	319	625	685	443	493
BE	FR	AUBANGE	MONT ST MARTIN	220.51	18	22	-9	43	75	58	39	32	123	154	82	97
BE	FR	AUBANGE	MOULAINE	220.51	3	5	-24	27	49	37	20	15	106	134	68	81
BE	FR	AVELGEM	AVELIN	380.80	242	-123	-113	-11	230	151	177	-106	430	555	312	339
BE	FR	AVELGEM	MASTAING	380.79	-129	-175	-197	-176	-100	-150	-146	-267	-11	36	-41	-65
BE	FR	MONCEAU	CHOOZ	220.48	-89	-104	-122	-116	-84	-98	-106	-124	-63	-38	-69	-83
BE	NL	VAN EYCK 1	MAASBRACHT	380.27	-796	-613	-636	-661	-682	-670	-685	-561	-621	-646	-573	-791
BE	NL	VAN EYCK 2	MAASBRACHT	380.28	-564	-408	-375	-347	-437	-357	-422	-122	-249	-329	-323	-589
BE	NL	ZANDVLIET	BORSSELE	380.29	-603	-300	-268	-370	-710	-666	-690	-611	-728	-808	-525	-499
BE	NL	ZANDVLIET	GEERTRUIDENBERG	380.30	-421	-118	-64	-120	-221	-180	-209	-74	-242	-329	-253	-527
BE	LU	BELVAL	SCHIFFLANGE	220.511	-79	-32	-68	-78	-68	-84	-85	40	29	9	-9	-112

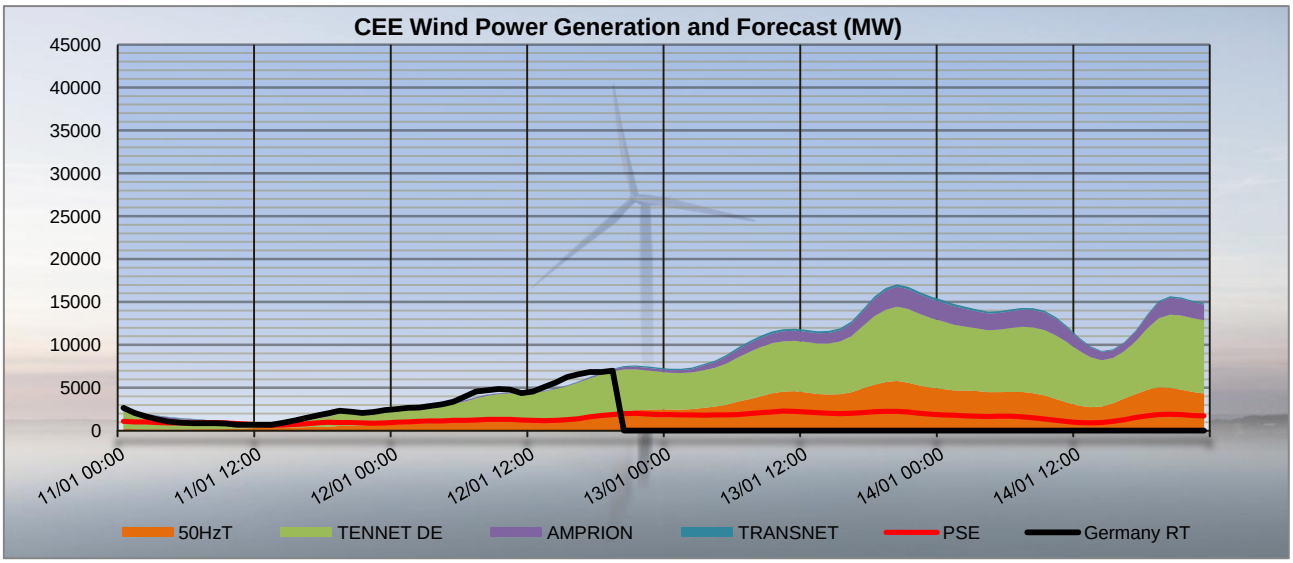
BE	FR	TOTAL		493	-120	-229	96	622	396	349	-131	1210	1526	795	862
BE	NL	TOTAL		-2384	-1439	-1343	-1498	-2050	-1873	-2006	-1368	-1840	-2112	-1674	-2406
BE	LU	TOTAL		-79	-32	-68	-78	-68	-84	-85	40	29	9	-9	-112
TOTAL BELGIAN IMPORT/EXPORT				-1970	-1591	-1640	-1480	-1496	-1561	-1742	-1459	-601	-577	-888	-1656

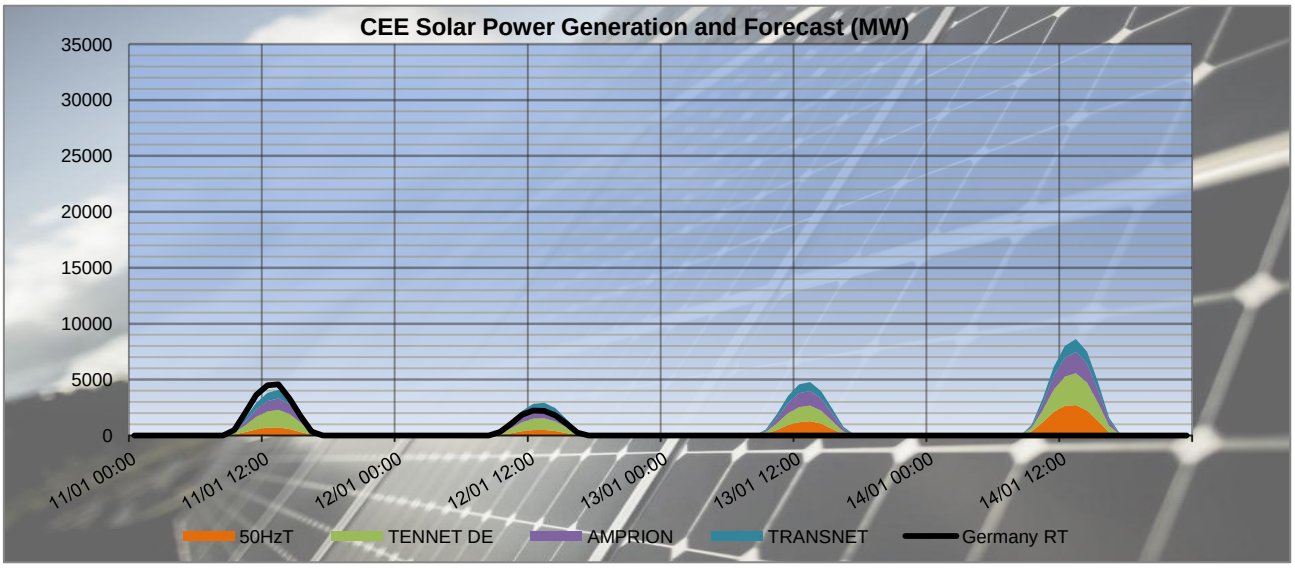
PST taps in DACF	**Zandvliet 1**	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	Zandvliet 2	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	Van Eyck 1	15	15	15	15	15	15	15	15	15	15	15	15	15	15
	Van Eyck 2	15	15	15	15	15	15	15	15	15	15	15	15	15	15
	Average	14	14	14	14	14	14	14	14	14	14	14	14	14	14

CREOS PST in DACF	**Schifflange**	15	15	15	15	15	15	15	15	15	15	15	15	15	15

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
Schifflange PST 1	**[1;35]**	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13

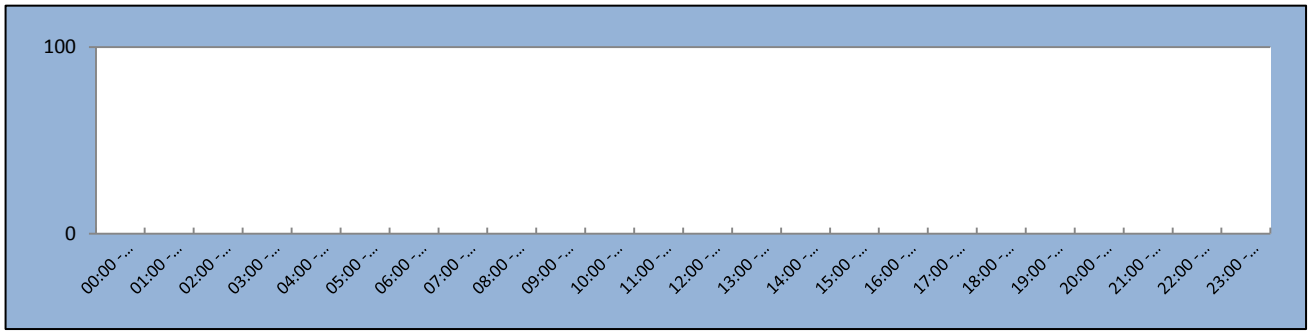
CEE Renewable Power Generation & Forecast



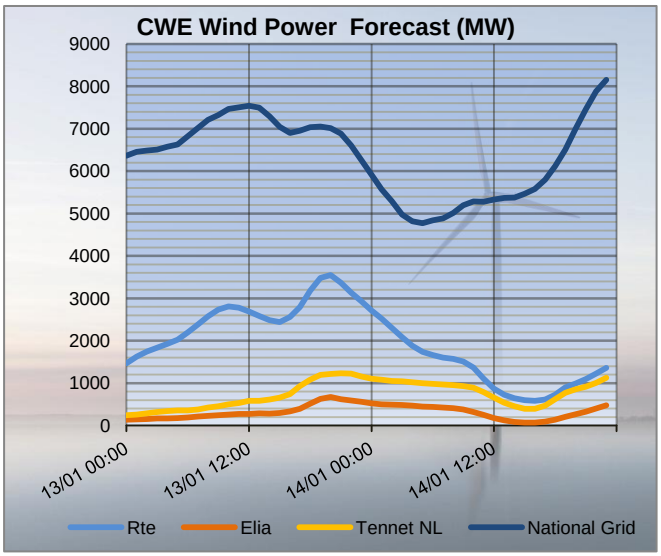


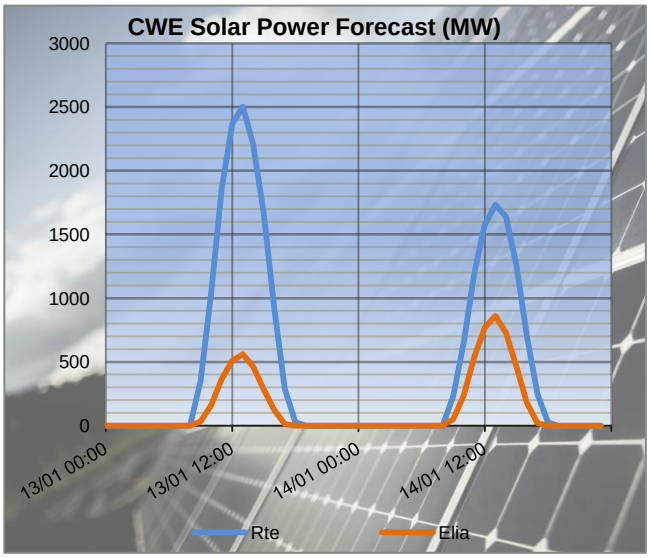
The charts above show the wind and solar generation forecasts for the TSOs in CEE (most significant) from D+1 until D-2 and the realised generation in Germany in real time. Source: Meteologica and 50HzT (RT)

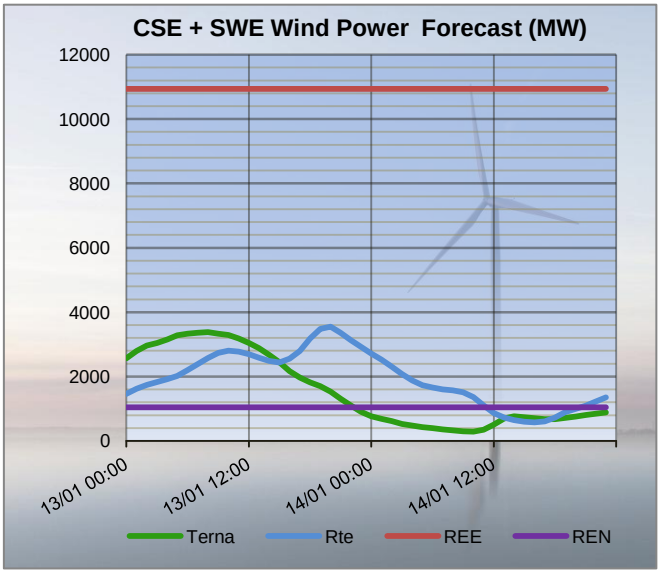
50HzT Preventive Redispatch

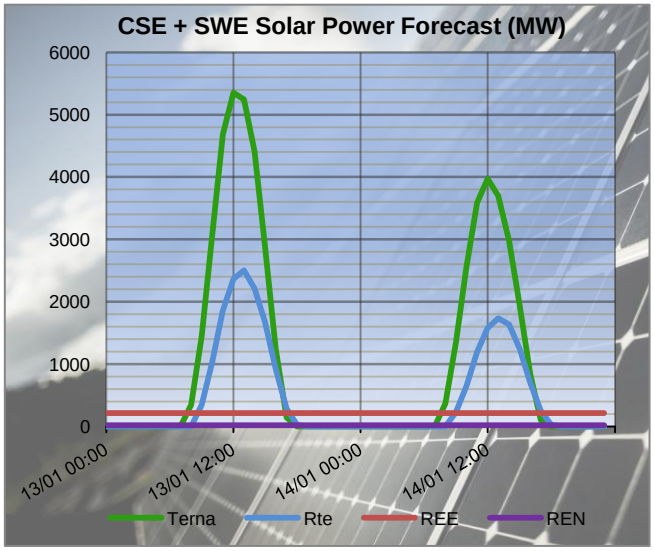


CWE, CSE & SWE Renewable Power Forecast (D-1 and D-2)









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	-246	-255	-9	-234	-329	-95	-294	-398	-104	-243	-365	-122
FR	BE	MONT ST MARTIN	AUBANGE	53	-22	-75	41	-43	-84	43	-58	-101	30	-39	-69
FR	BE	MOULAINE	AUBANGE	67	-5	-72	53	-27	-80	59	-37	-96	45	-20	-65
FR	BE	AVELIN	AVELGEM	33	123	90	84	11	-73	-54	-151	-97	-16	-177	-161
FR	BE	MASTAING	AVELGEM	137	175	38	234	176	-58	217	150	-67	254	146	-108
FR	BE	CHOOZ	MONCEAU	86	104	18	123	116	-7	141	98	-43	143	106	-37
FR	DE	MUHLBACH	EICHSTETTEN	-138	5	143	-214	12	226	-320	23	**343**	-369	-54	**315**
FR	DE	VOGELGRUN	EICHSTETTEN	-85	-23	62	-86	-23	63	-87	-24	63	-81	-27	54
FR	DE	ST AVOLD	ENSDORF	0	0	0	0	0	0	0	0	0	0	0	0
FR	DE	VIGY	ENSDORF 1	-266	-30	236	-210	-83	127	-87	-102	-15	-117	-107	10
FR	DE	VIGY	ENSDORF 2	-636	-363	**273**	-375	-211	164	-268	-244	24	-315	-260	55

				17:30			19:30			23:30		
		Node 1	Node 2	DACF	Merge	Delta	DACF	Merge	Delta	DACF	Merge	Delta
FR	BE	LONNY	ACHENE	-61	-319	**-258**	-407	-685	**-278**	-348	-493	-145
FR	BE	MONT ST MARTIN	AUBANGE	87	-32	-119	-63	-154	-91	-17	-97	-80
FR	BE	MOULAINE	AUBANGE	98	-15	-113	-46	-134	-88	-5	-81	-76
FR	BE	AVELIN	AVELGEM	200	106	-94	-514	-555	-41	-374	-339	35
FR	BE	MASTAING	AVELGEM	325	267	-58	-17	-36	-19	51	65	14
FR	BE	CHOOZ	MONCEAU	174	124	-50	106	38	-68	132	83	-49
FR	DE	MUHLBACH	EICHSTETTEN	-62	279	**341**	-119	147	**266**	-236	-59	177
FR	DE	VOGELGRUN	EICHSTETTEN	-22	35	57	-66	-14	52	-94	-49	45
FR	DE	ST AVOLD	ENSDORF	0	0	0	0	0	0	0	0	0
FR	DE	VIGY	ENSDORF 1	194	144	-50	-149	-112	37	-454	-267	187
FR	DE	VIGY	ENSDORF 2	64	56	-8	-302	-224	78	-661	-433	228

				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	123	129	6	-9	130	139	-75	127	202	-119	73	192
FR	CH	MAMBELIN	BASSECOURT	-337	-299	38	-405	-325	80	-398	-268	130	-429	-307	122
FR	CH	SIERENTZ	BASSECOURT	484	452	-32	463	468	5	394	419	25	389	403	14
FR	CH	BOIS TOLLOT	ROMANEL	28	-28	-56	-29	-39	-10	4	-21	-25	-23	-54	-31
FR	CH	SIERENTZ	LAUFENBURG	192	84	-108	87	65	-22	-23	61	84	-117	-3	114
FR	CH	CORNIER	RIDDES	-84	-61	23	-89	-49	40	-79	-28	51	-85	-35	50
FR	CH	CORNIER	ST TRIPHON	-120	-66	54	-126	-51	75	-101	-51	50	-104	-59	45
FR	CH	PRESSY	VALLORCINES	-195	-160	35	-200	-136	64	-186	-127	59	-187	-131	56
FR	CH	BOIS TOLLOT	VERBOIS	165	224	59	109	193	84	137	197	60	154	205	51
FR	CH	GENISSIAT	VERBOIS	53	71	18	77	119	42	110	134	24	96	114	18
FR	CH	GENISSIAT	VERBOIS	53	71	18	78	119	41	110	134	24	96	114	18
FR	IT	ALBERTVILLE	RONDISSONE	599	406	-193	633	440	-193	704	541	-163	643	500	-143
FR	IT	ALBERTVILLE	RONDISSONE	631	377	**-254**	702	460	-242	776	571	-205	709	528	-181
FR	IT	MENTON	CAMPOROSSO	251	147	-104	144	152	8	149	157	8	156	141	-15
FR	IT	VILLARODIN	VENAUS	109	36	-73	289	223	-66	478	416	-62	468	457	-11

				17:30			19:30			23:30		
		Node 1	Node 2	DACF	Merge	Delta	DACF	Merge	Delta	DACF	Merge	Delta
FR	CH	SIERENTZ	ASPHARD	3	247	244	32	216	184	-2	129	131
FR	CH	MAMBELIN	BASSECOURT	-292	-173	119	-384	-256	128	-410	-308	102
FR	CH	SIERENTZ	BASSECOURT	370	399	29	439	482	43	500	493	-7
FR	CH	BOIS TOLLOT	ROMANEL	57	41	-16	24	8	-16	-17	-81	-64
FR	CH	SIERENTZ	LAUFENBURG	26	134	108	18	137	119	107	126	19
FR	CH	CORNIER	RIDDES	-36	7	43	-67	-15	52	-98	-64	34
FR	CH	CORNIER	ST TRIPHON	-56	-5	51	-96	-39	57	-139	-98	41
FR	CH	PRESSY	VALLORCINES	-120	-69	51	-170	-107	63	-225	-181	44
FR	CH	BOIS TOLLOT	VERBOIS	162	224	62	120	208	88	121	188	67
FR	CH	GENISSIAT	VERBOIS	133	163	30	116	158	42	81	101	20
FR	CH	GENISSIAT	VERBOIS	133	163	30	116	158	42	82	101	19
FR	IT	ALBERTVILLE	RONDISSONE	726	625	-101	883	718	-165	714	515	-199
FR	IT	ALBERTVILLE	RONDISSONE	791	660	-131	976	766	-210	770	483	**-287**
FR	IT	MENTON	CAMPOROSSO	154	155	1	150	146	-4	143	152	9
FR	IT	VILLARODIN	VENAUS	501	556	55	692	659	-33	493	426	-67

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	40	2448	39
	Doel - Mercator (51)	2239	37	2239	42
	Doel - Mercator (52)	2239	37	2239	42
	Doel - Mercator (54)	2448	37	2448	42
	Doel - Zandvliet (25)	2349	18	2349	27
	Mercator - Horta (73)	2569	39	2569	49
	Courcelles - Gramme (31)	2349	45	2349	44
	Mercator - Rodenhuize/Horta (74)	2349	45	2349	54
RTE	Attaques - Warande 2	3780	57	3780	60
	Avelin - Gavrelle	2622	39	2622	57
	Avelin - Warande	3458	10	3458	6
	Lonny - Seuil	4149	26	4149	29
	Mandarins - Warande 1	3780	53	3780	56
	Muhlbach - Scheer	2598	20	2598	28
	Revigny - Vigy	2596	40	2596	42
	Warande - Weppes	3458	16	3458	12

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	32	2520	26
		Hagenwerder - Mikulowa (567)	2520	18	2520	29
		Hagenwerder - Mikulowa (568)	2520	18	2520	29
		Remptendorf - Redwitz (413)	3485	50	3507	52
		Remptendorf - Redwitz (414)	3485	50	3507	52
		Röhrsdorf - Hradec (445)	2520	35	2520	37
		Röhrsdorf - Hradec (446)	2520	35	2520	37
		Vieselbach - Mecklar (449-1)	2520	34	2520	28
		Wolmirstedt - Helmstedt (491-1)	2400	20	2400	11
		Wolmirstedt - Helmstedt (492-2)	2400	20	2400	11
	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	19:30 & 22:30	380	Warande	Mandarins	axis	101%	380	Warande	Attaques	axis	19:30
		Curative action: 2-nodes topology = > 98% remaining									

Constraints greater than 100% on NL + Amprion 400kV grids and greater than 120% on DE, CZ, PL and SK 400kV grids

TSO	Validity	Contingency				Constraint					Timestamps of max
		U (kV)	Substation 1	Substation 2	Code	Overload	U (kV)	Substation 1	Substation 2	Code	
TenneT NL	06:30 - 07:30 & 13:30	380	Lelystad	Ens	axis	102%	380	Lelystad	Ens	remaining	17:30
		Preventive action: 2-nodes topology at Lelystad => 89% 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	
400	Mercator	Busbar	2A	122%	150	Lillo	Zandvliet		06:00 - 24:00

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): **01:30**
- Peak period (07:00 – 23:00): **22:30**

Adaptations made on merged DACFs:

Off-peak:

- SI ➔ IT physical flow adapted to the target flow : **1960 MW , Divaca PST by-passed**
- Mendrisio-Cagno flow adapted to the schedule : **199 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 : **1880 MW , Divaca PST by-passed**
- Mendrisio-Cagno flow adapted to the schedule : **164 MW**
- PST of Lienz adapted to **150 MW**
- PST of Camporosso adapted to **150 MW**

Variant: 19:30

- SI ➔ IT physical flow adapted to the target flow : **1580 MW , Divaca PST by-passed**
- Mendrisio-Cagno flow adapted to the schedule : **200 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	2	2
		Grande Ile	1	1
	Terna	Turbigo	1	1
		Baggio	1	1
		Bovisio	**1**	**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	23	2370	37
		Albertville - Rondissone 2	2370	22	2370	36
		Bulciago - Soazza	2300	27	2300	44
		Cagno - Mendrisio	855	37	855	34
		Musignano - Lavorgo	2270	37	2270	61
		Redipuglia - Divaca	2700	98	2700	94
		Robbia - San Fiorano	2530	19	2530	40
		Robbia - Gorlago	2530	42	2530	60
		Venaus - Villarodin	2715	15	2715	26
	220 kV	Airolo - Ponte	900	21	900	19
		Lienz - Soverzene	750	50	750	48
		Menton - Campo Rosso	1165	29	1165	33
		Padriciano - Divaca	960	35	960	35
		Riddes - Avise	1010	1	1010	21
		Riddes - Valpelline	1010	1	1010	23
		Serra - Pallanzeno	900	19	900	32

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	1151	2462	148	1957
	Compensation ratio (calculated from NTC)	39%	49%	4%	8%
	Pentalateral impact on physical flows	-26%	-56%	-3%	-15%
Peak	Initial physical flows on adapted base case	1815	4042	147	1881
	Compensation ratio (calculated from NTC)	37%	50%	4%	9%
	Pentalateral impact on physical flows	-26%	-55%	-3%	-16%

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	Terna / SWG / ELES	380	Robbia	Filisur Pradella-Sils	N-K	122%	380	Redipuglia	Divaca	
		Curative action: Open the tie-lines Redipuglia-Divaca 380kV and Padriciano-Divaca 220kV => 200% on Lienz-Soverzene, so **open the tie-line Lienz-Soverzene first => no cascading effect** (for info: Sils-Soazza at 96%).								

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
Off Peak	Terna / SWG / ELES	380	Robbia	Filisur Pradella-Sils	N-K	124%	380	Redipuglia	Divaca	
		Preventive actions: Max taps on Rondissone PSTs and **Pentalateral reduction of 800 MW between IT and SI => 99% remaining.** **Note:** we can't open the tie-lines Redipuglia-Divaca 380kV and Padriciano-Divaca 220kV as it generates the following constraints (122% on Lavorgo-Musignano, 118% on Sils-Soazza, 108% on Soazza-Bulciago and 262% on Lienz-Soverzene)								

Variant: 19:30

	TSO	Contingency				Constraint				
		U (kV)	Substation 1	Substation 2	Code	Overload	U (kV)	Substation 1	Substation 2	Code
Variant	Terna / SWG	380	Robbia	Filisur Pradella-Sils	N-K	96%	380	Lavorgo	Musignano	
		With the "Flow regulation" setting on Mendrisio PST, the flow on Lavorgo-Musignano is "only" at 96% but without this setting on Mendrisio PST, the flow on Lavorgo-Musignano is at 105% and SWG sent a warning fax of Pentalateral reduction assessment because they detected this overload.								

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	278
Rondissone 1 (1/33)	30	357
Rondissone 2 (1/33)	32	374
Camporosso (-32/32)	-19	139
Lienz (-32/32)	-8	150
Padriciano (1/33)	20	138
Divaca (-32/32 each)	-26	0

PST	Peak	
	Tap position	Physical flow to Italy (MW)
La Praz (1/33)	1	466
Rondissone 1 (1/33)	33	613
Rondissone 2 (1/33)	33	572
Camporosso (-32/32)	-15	201
Lienz (-32/32)	-9	147
Padriciano (1/33)	20	135
Divaca (-32/32 each)	-26	0

Conclusion

CWE: No constraint detected.

CEE: No critical constraint detected.

CSE: High flows expected from Slovenia to Italy due to the by-passed Divaca PSTs so a Pentalateral reduction may be required for evening hours if the PSTs will not be back in service at 17:00 as expected.