NCC Dashboard

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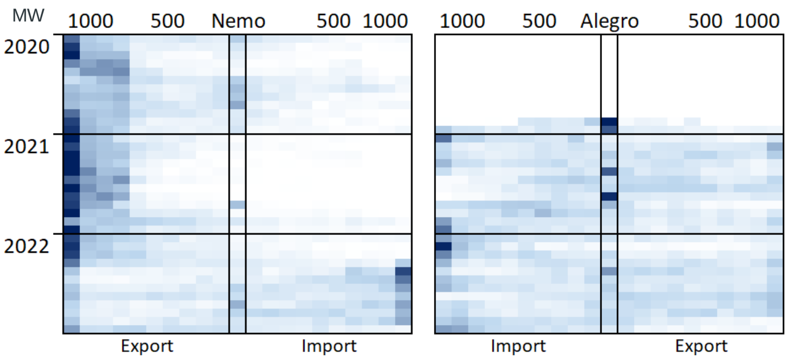
Nemo & Alegro flows



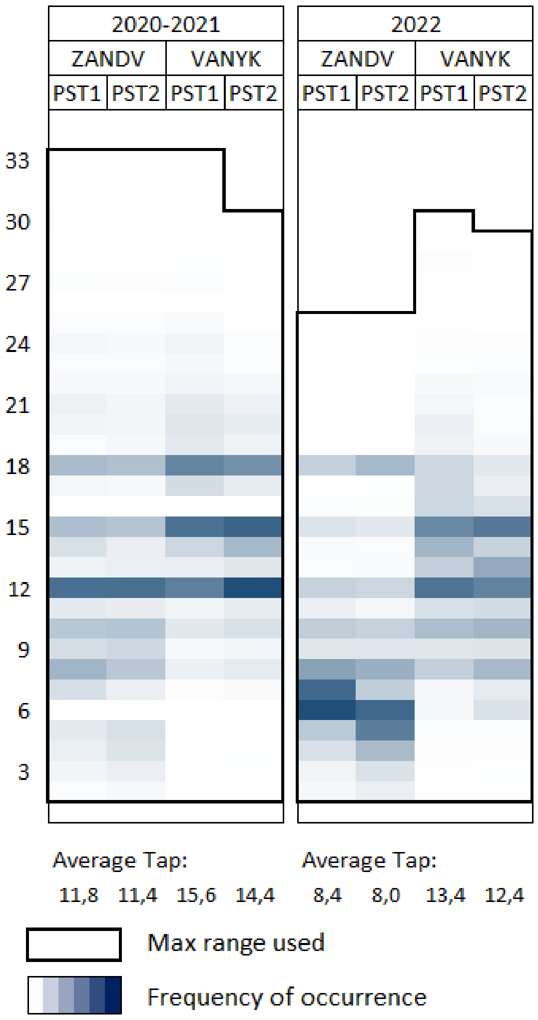
Special events

EAS/Elia Emergency **0**

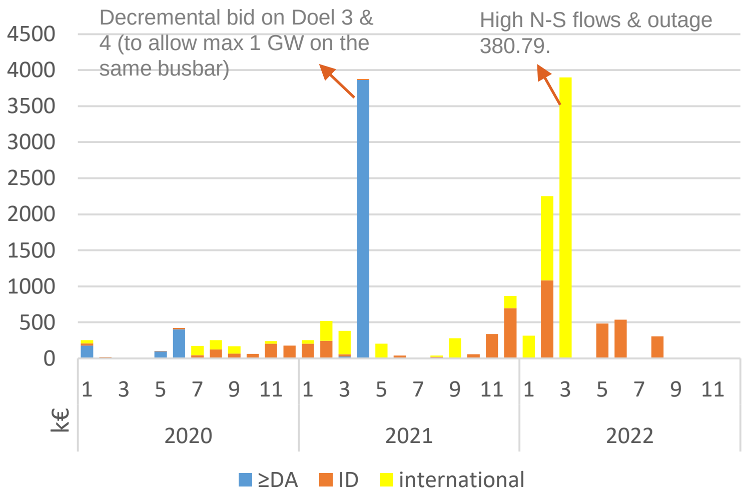
EAS Alert **2**

16/12: 380.23 // as HTLS line
16/12: At 08:17 Sudden frequency drop of ~60 mHz down to 49.92 Hz.The reason appears to be a large imbalance in Ukraine.
14/11: Loss of the substation Achène 380 kV at 11:17 Due to the switching for the thermovision
04/11: 380.80 HTLS //. Complete Axis Merca-Aveli now upgraded
04/10: Zandvliet IDN PST's 3 & 4 and Zandv GIS substation
23/09: Doel 3 was officially stopped on 23/09 at 21h29.
22/06: Loss of some IT tools (offline network calc, market,…)
17/06: 380.79 // as a HTLS line (Pnom = 2724 MVA)
14/04: Doel longitudinal couplers back in service.
01/02: Trip of lines 380.25+65: downward modulation on Doel 3+4 was needed to solve congestion
21/01: Line 380.24 Meerh-Vanyk in service. Pnom = 2300 MVA
15/01: Network congestion required 1000 MW CT FR -> BE -> NL

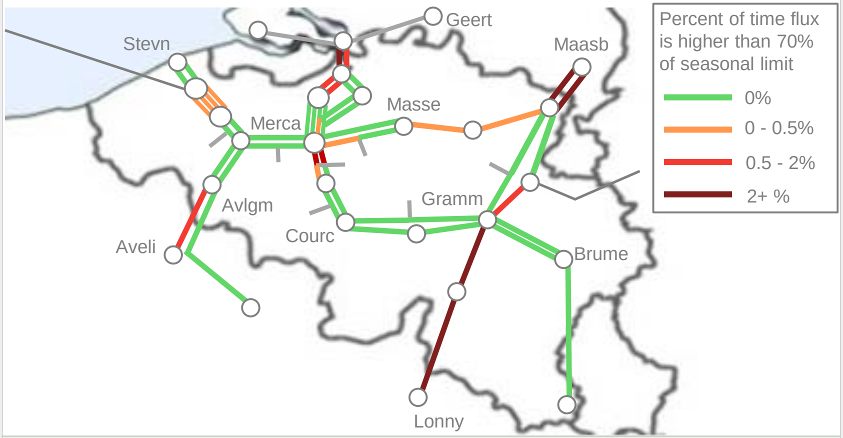
PSTs tap usage



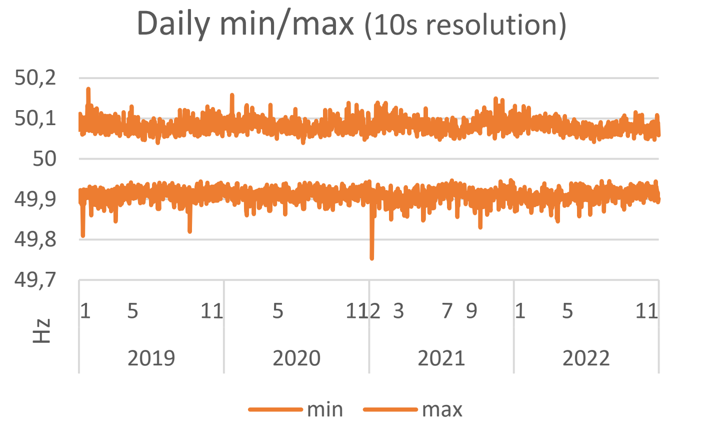
Congestion management: 7.8 M€ (2022)



Flux (2022)

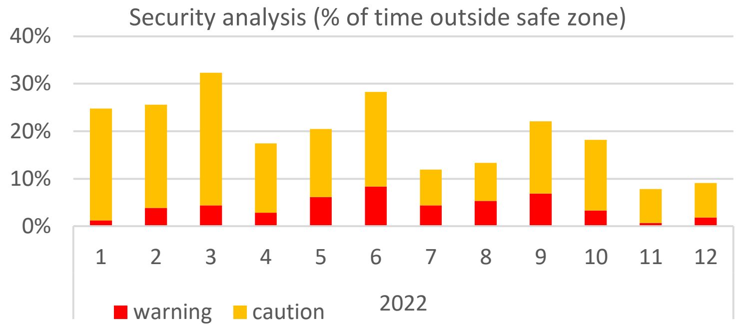


Frequency



<u>10 Jan 2019:</u> A measurement on a tieline Austria-Germany was not redundant and failed
<u>8 Jan 2021:</u> A grid split Balkan & Romania caused the frequency in our part of Europe to drop to 49.75 Hz
<u>17 May 2021:</u> Frequency dropped to 49.85 Hz due to a trip of 3300 MW generation in Poland
<u>24 July 2021:</u> Iberian grid split. no significant impact on frequency since the flow over that border was not huge
<u>Oct-Dec 2021:</u> KOST (Kosovo TSO) is structurally short again in fall/winter 2021 and an accumulated grid time deviation of -87s is reached on December 24th (normal time deviation is +/- 20s)

Security analysis



Most frequent Critical Branches

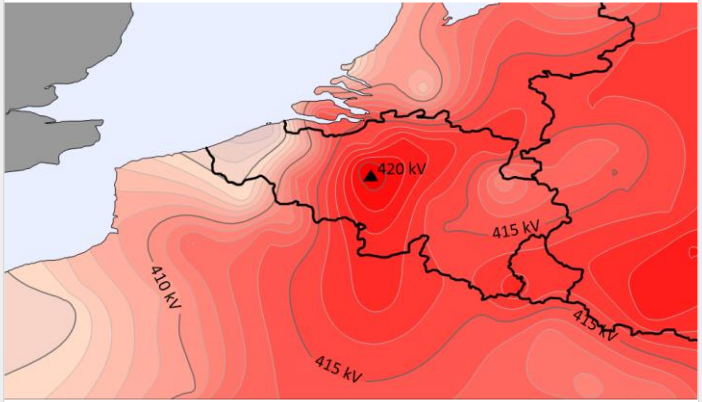
(as % of time CB's appear in caution or warning zones in 2022)

1. AUBAN380 T 2 380/220/3	2.3%
2. DI 380 54 DOEL MERC	1.9%
3. DI 380 53 DOEL MERC	0.8%
4. MEERH380 T 2 380/150/3	0.6%
5. DI 380 36 BUGG+MERC	0.4%

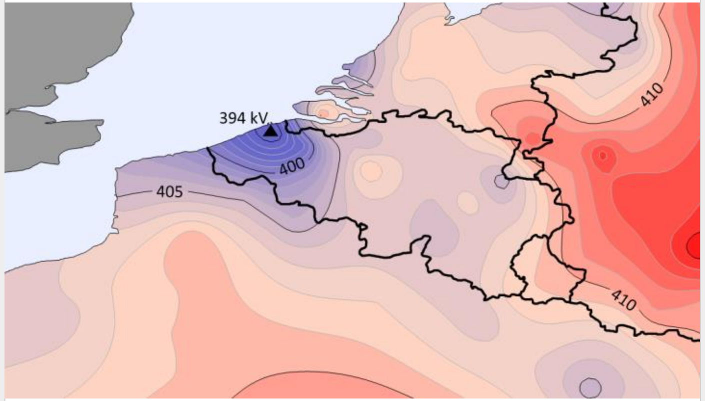
Highest N-1 overloads

CO	CB	N-1 loading
AVLGM380 R 1 @24/06/2022 09:54	DI 150 25 DRONGNIEU	146%
GRAMM380 R A @20/05/2022 22:00	AUBAN380 T 2 380/220	142%
HORTA380 R 1 @23/08/2022 11:16	DI 150 140 EEKLNRODE	137%

Voltages



Highest voltages reached Sun 09/10/2022 17:15
Highest node: Bruegel @ 420 kV



Lowest voltages reached Sat 09/04/2022 23:00
Lowest node: Stevin @ 394 kV

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ACE

Max qh deviation

-930 MW

@ Tue 05/04/2022 19:15
Load around 600 MW higher

System Imbalance

Max qh deviation

-1329 MW

@ Sun 19/06/2022 08:15
Very fast and deep wind reduction:
2GW lower than forecasted!

Automatic Balancing

aFRR + iGCC

982 GWh/year

+6% (vs. 2021)

Manual Balancing

mFRR + inter-TSO

403 GWh/year

+46% (vs. 2021)

Prices

Average Belgian price:

240 €/MWh

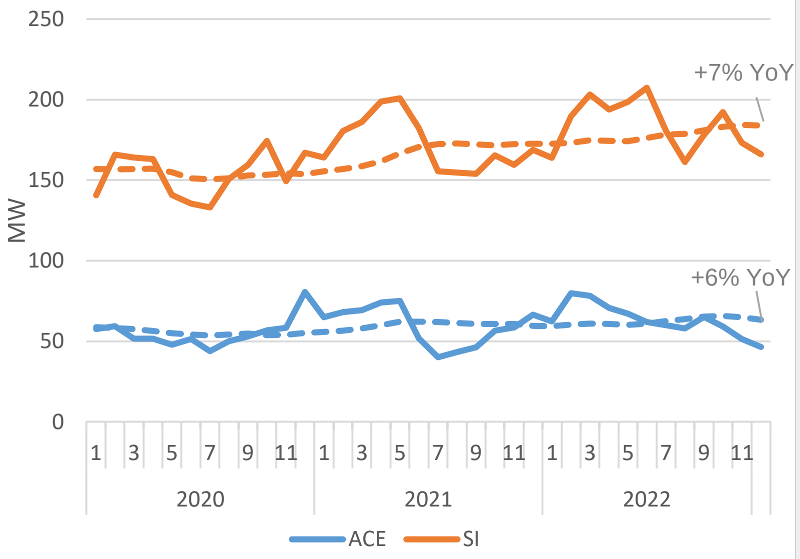
Imbalance price spike:

2000 €/MWh

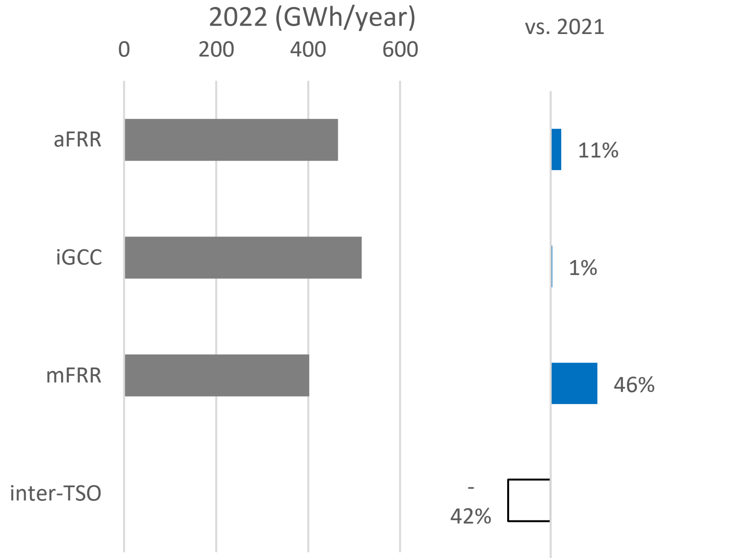
@ Sun 04/12/2022 11:45

St.dev of ACE and SI

(monthly values & 12m-rolling averages)



Balancing Activations



Belgian Day-Ahead price (€/MWh)

	2020-2021	2022
Max (h)	620	871
Average	65	240
Min (h)	-115	-100

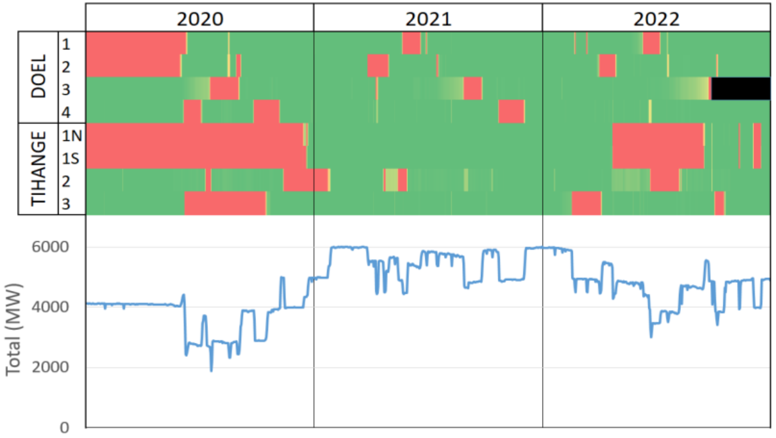
Imbalance (€/MWh)

	2020-2021	2022
Max (qh)	3199	2000
Average	67	233
Min (qh)	-565	-589

NCC Dashboard

2022 | Grid | **Market** | Planning

Nuclear availability & total production



Total load

Average Total load (2022):

9336 MW

-3,8% (vs 2017-2021)

Average Total normalized load (2022)

Correcting for actual temperature vs. normal temperatures. This gives a better indication of **change in consumer behavior**

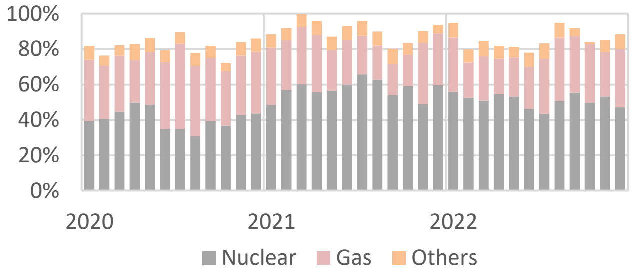
9473 MW

-3,1% (vs 2017-2021)

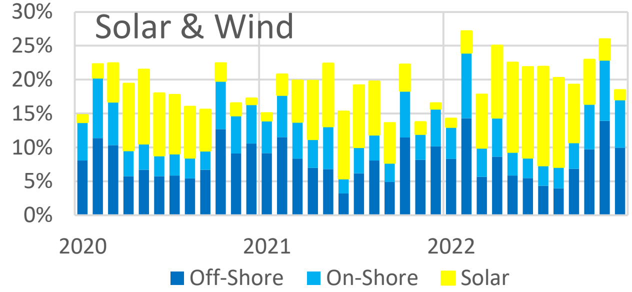
Generation Mix

As % of total load

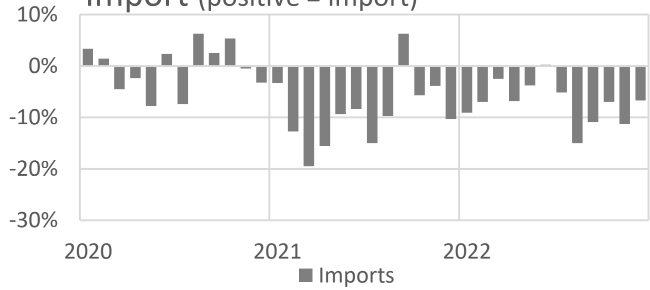
Thermal & others



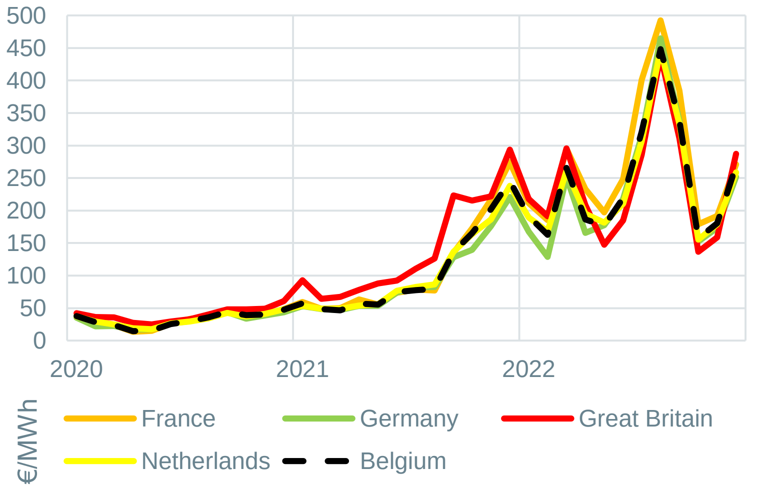
Solar & Wind



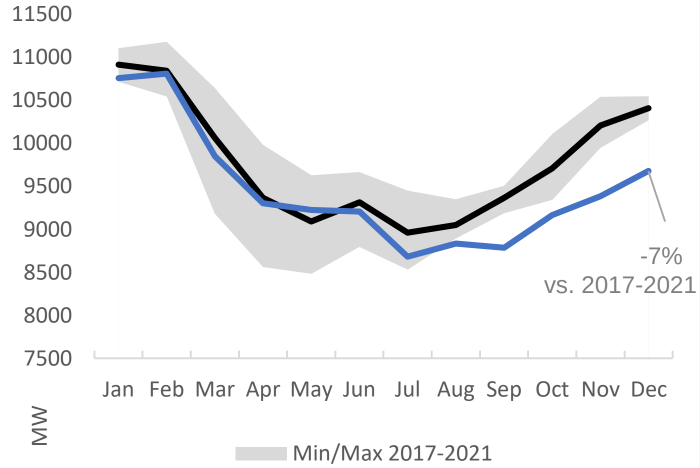
Import (positive = import)



NWE Prices (baseload)



Total normalized load



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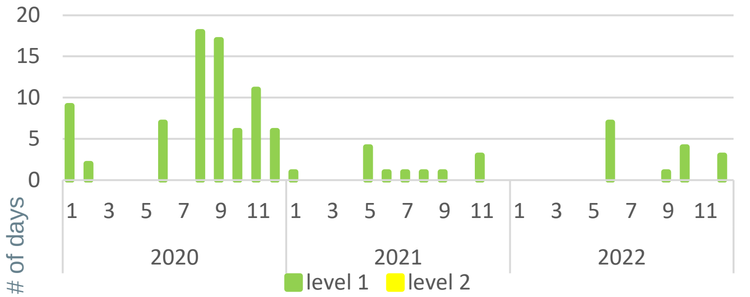
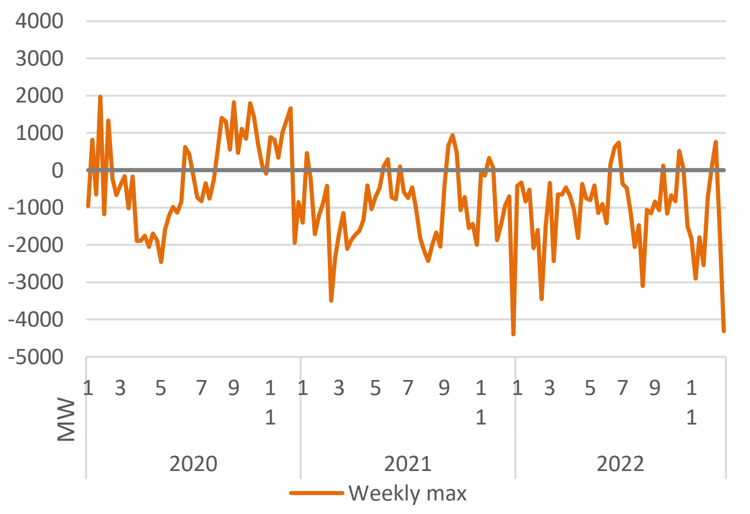
Scarcity levels triggered

Scarcity level 2 (Belgium depending on foreign energy & high market coupling) hasn't been triggered for over 2 years

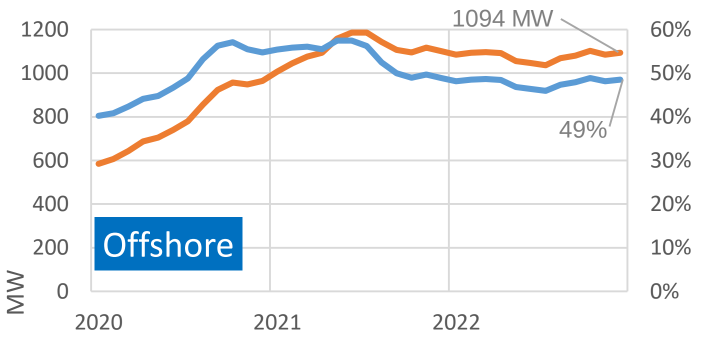


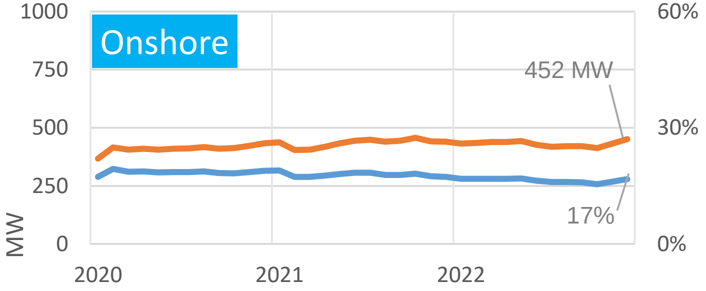
Import needed to be adequate

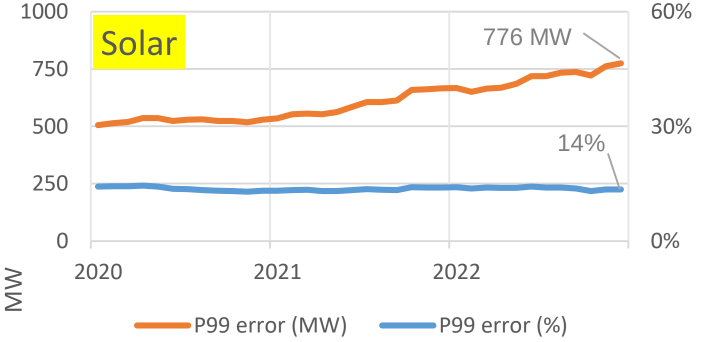


Renewable day-ahead forecasting errors

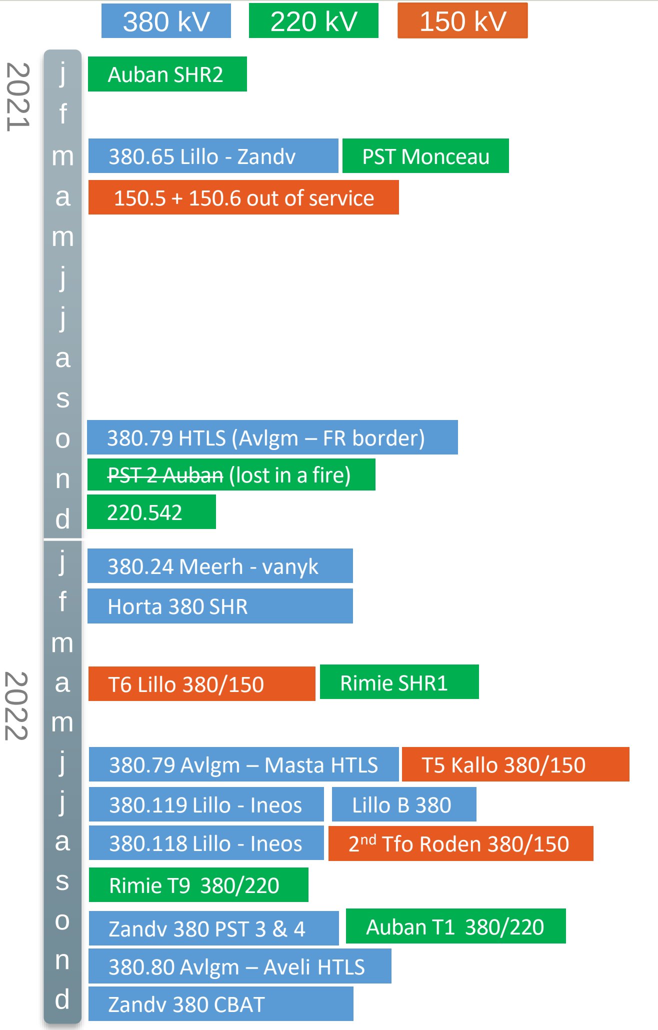
12-month moving averages





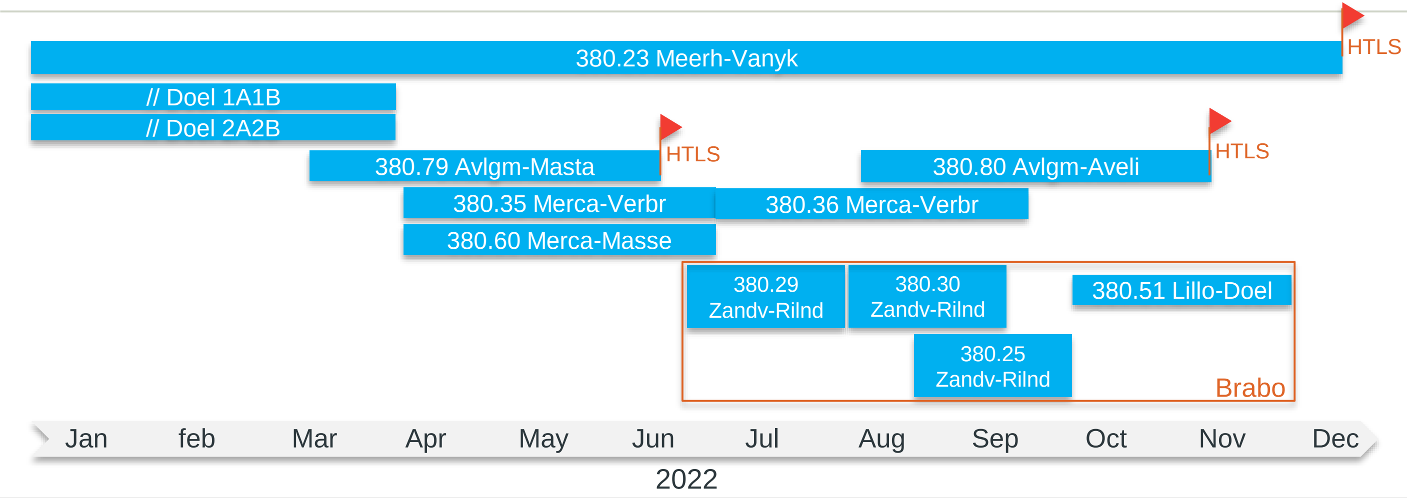


Infra Projects



FB market limiting branches

380 kV Long-duration Outages



Flow-based Market Coupling: Top 10 limiting axis

Current (2022)

1	[NL-D2] Meeden - Diele	21.6%
2	[BE-FR] Avelgem - Avelin/Mastaing	16.9%
3	[D7-D7] Beurs-Lambstein	15.6%
4	[BE-FR] Gramme - Lonny	15.2%
5	[NL-BE] ZANDV - Rilland	10.5%
6	[NL-BE] Maasb - Vanyk	7.9%
7	[NL-NL] Lely-Dieme	5.3%
8	[NL-D7] Maasb - Siers/Obzie	4.3%
9	[FR-D7] Vigy - Ensdorf	3.8%
10	[D7-D7] Gronau PST	2.7%

Reference (2021)

1.	NL-DE	Meeden - Diele	19.5%
2.	BE-FR	Avlgm - Avelin/Masta	13.0%
3.	DE-AT	StPeter - Pleinting	12.6%
4.	BE	Zandv PSTs	11.7%
5.	DE	Buers - Lambsheim	10.2%
6.	FR-DE	Vigy – Ensdorf	9.4%
7.	BE-FR	Gramme - Lonny	9.1%
8.	AT	Sitting - Altheim	5.8%
9.	NL	Lely - Dieme	4.6%
10.	BE	Vanyk – Lixhe - Gramm	3.5%