

Weather, Power & Market Forecasts with Grafana



Max von Roden

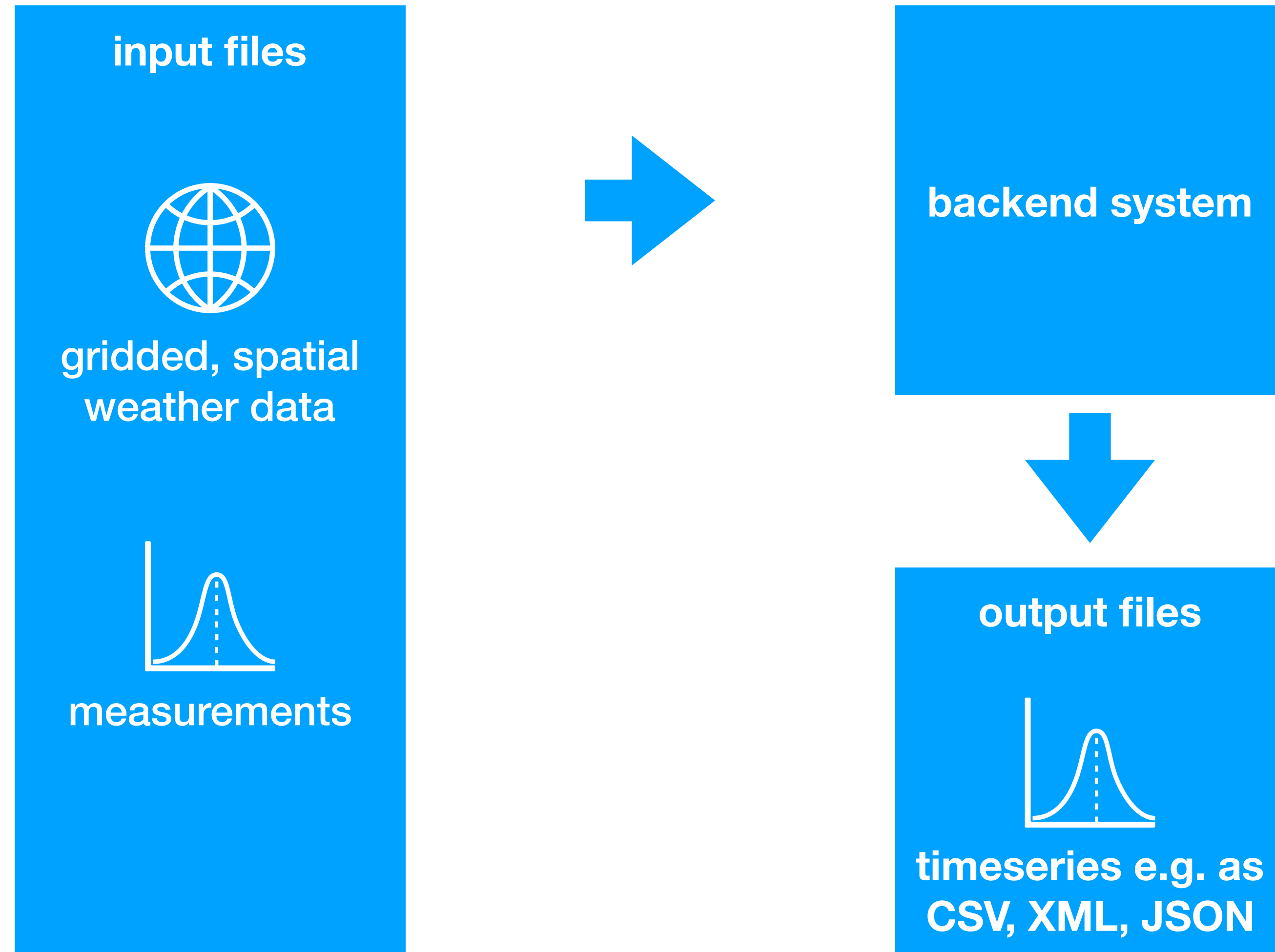


Robin Girmes

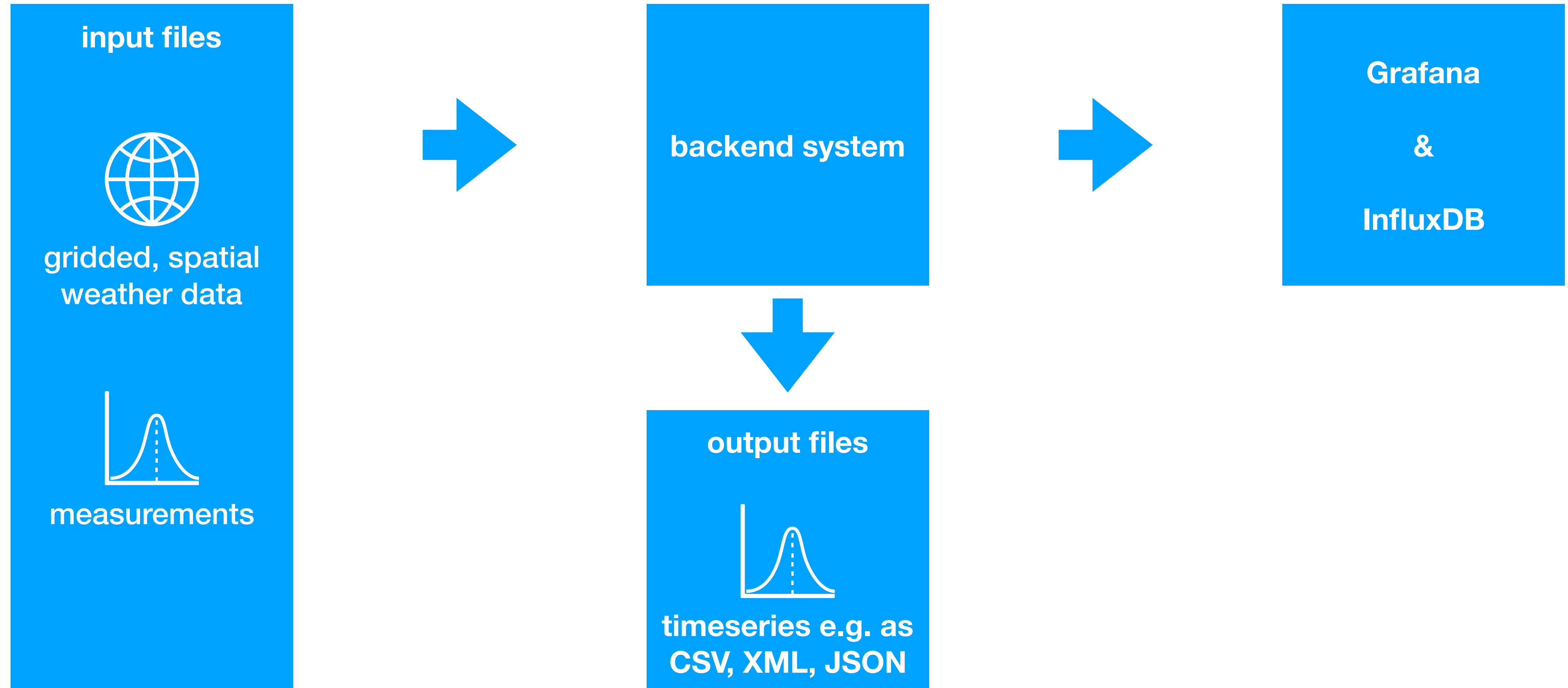


Steffen Knott

system overview

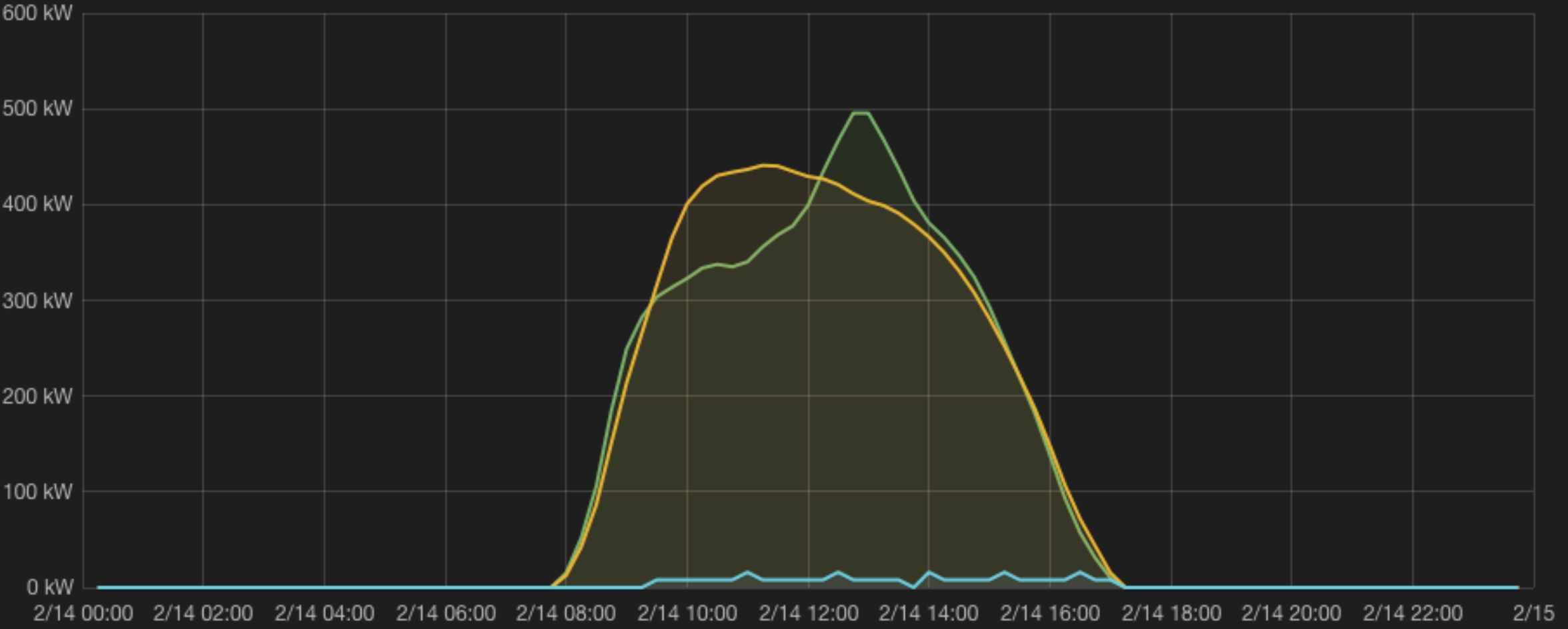


system overview



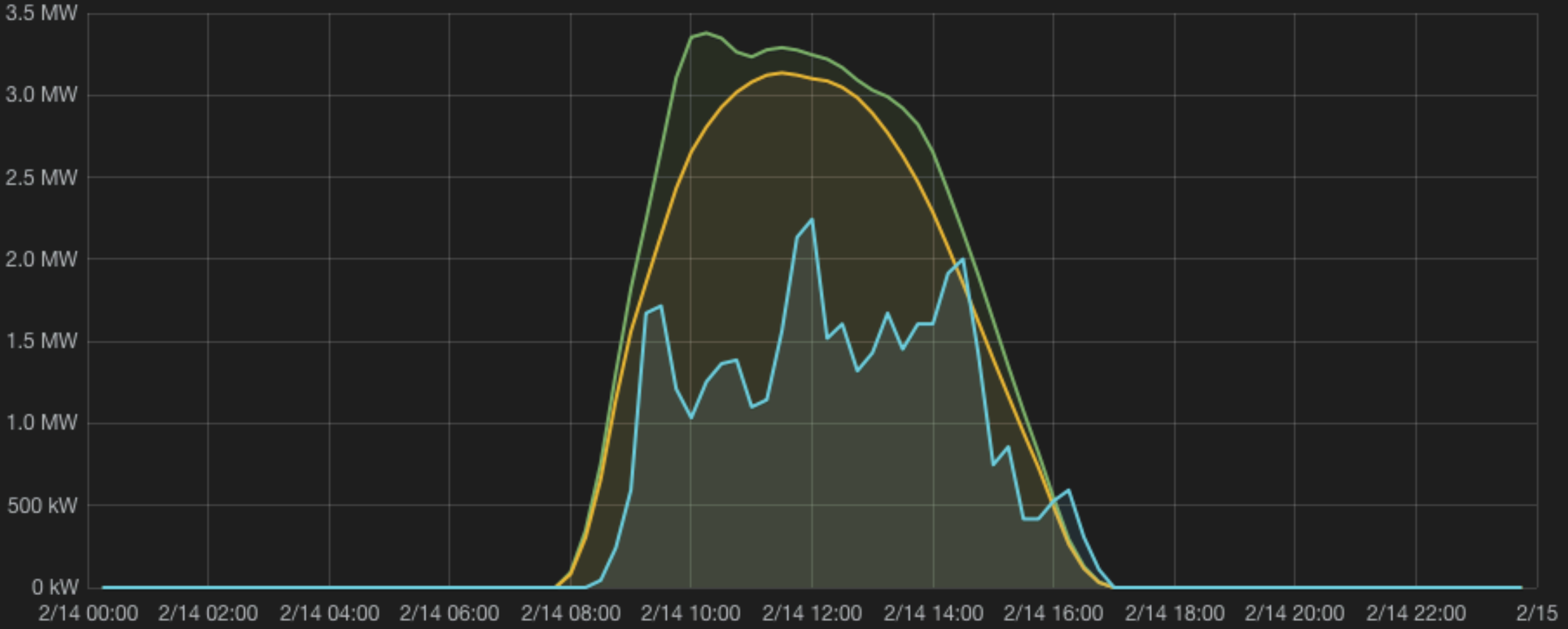
MODEL IMPROVEMENT & DEVELOPMENT

Reference Plant North



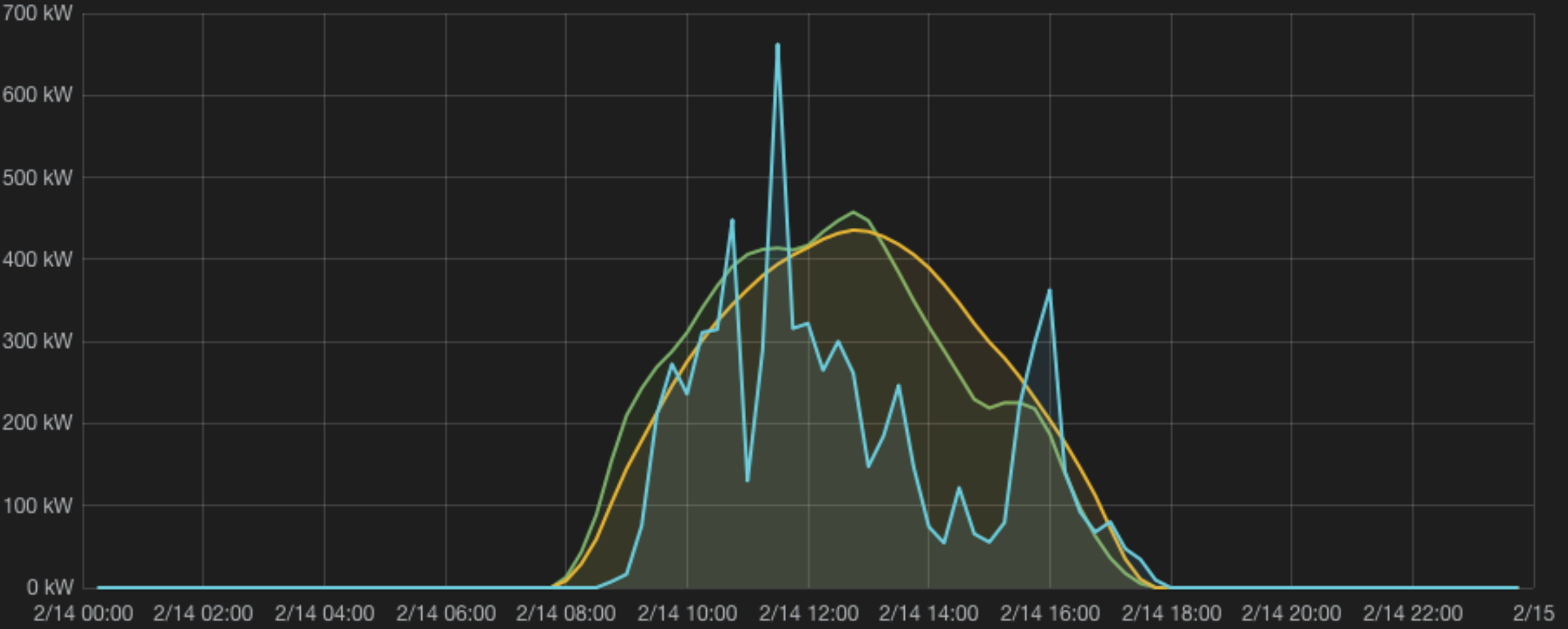
	max	total
NoSysLoss 07	496 kW	10.581 MW
StandardModelMix 07	441 kW	10.835 MW
Measurement	16 kW	280 kW

Reference Plant North East



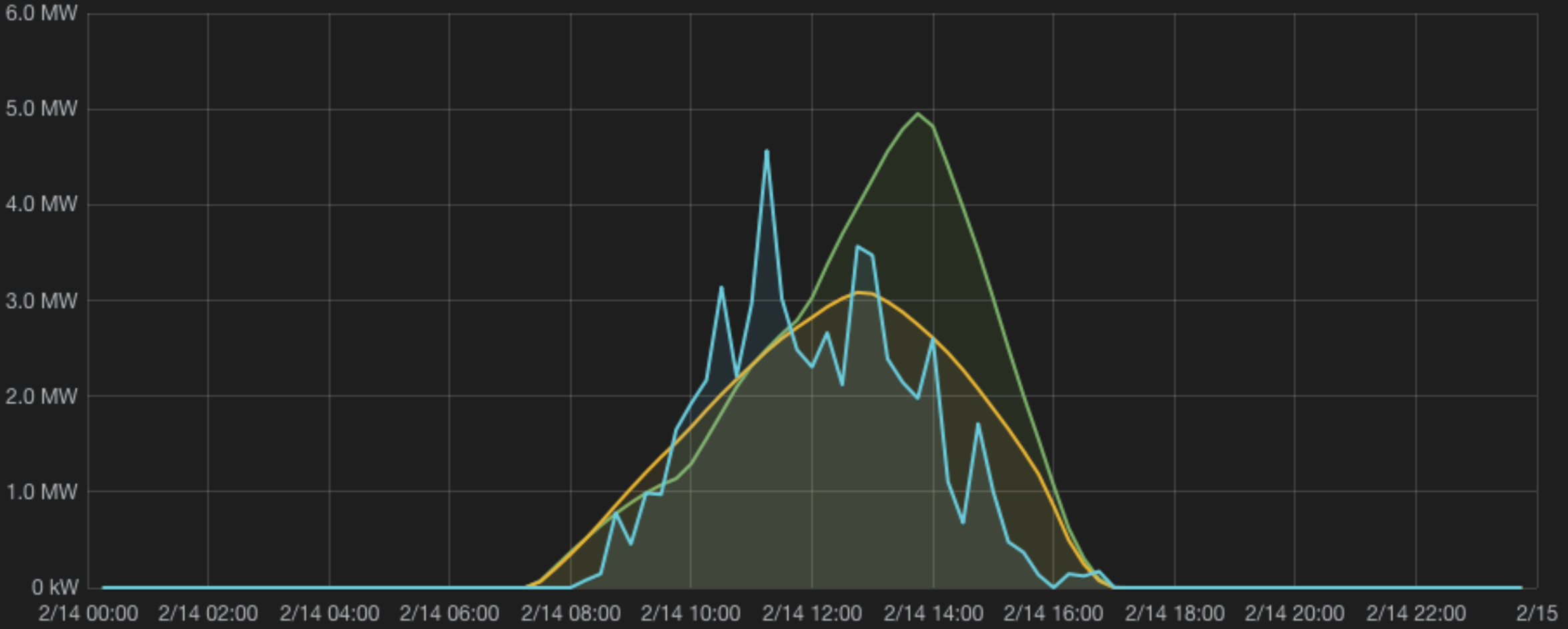
	max	total
NoSysLoss 07	3.379 MW	78.265 MW
StandardModelMix 07	3.136 MW	70.016 MW
Measurement	2.244 MW	40.238 MW

Reference Plant West



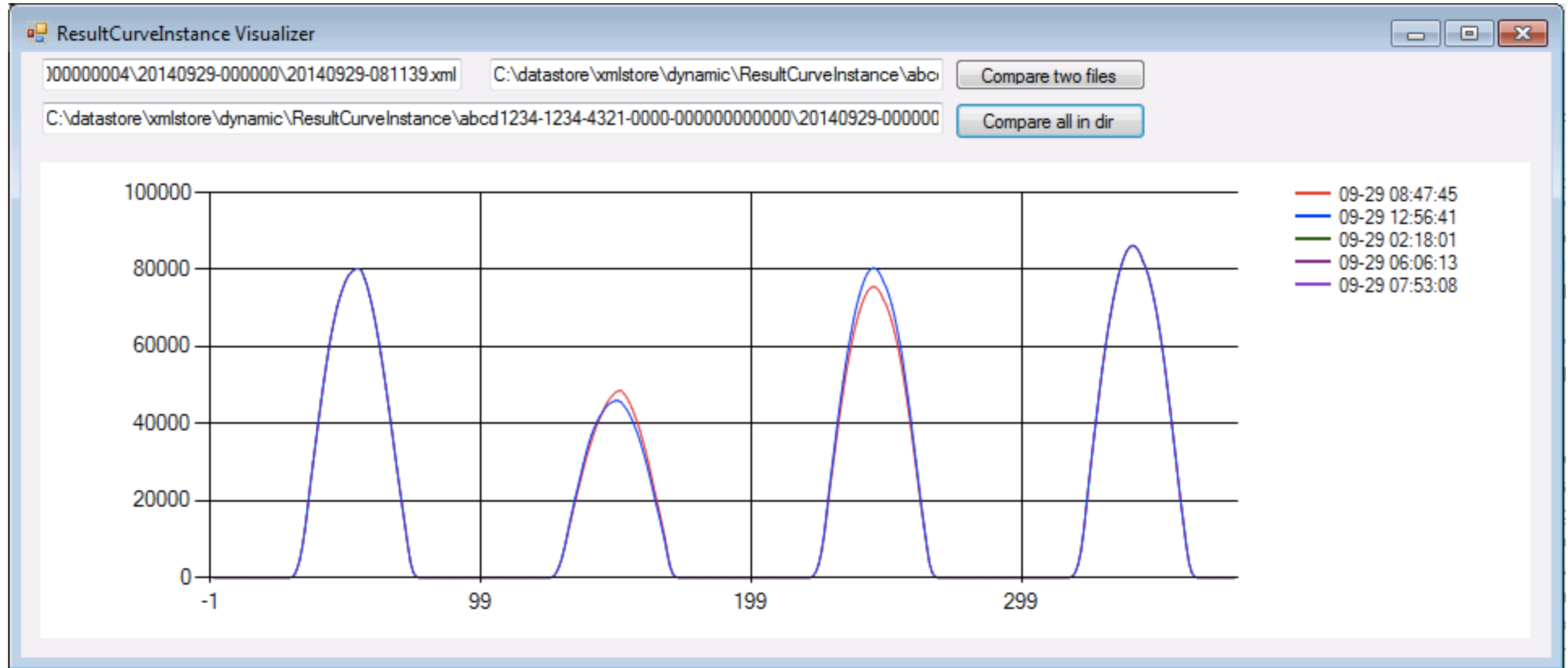
	max	total
NoSysLoss 07	458 kW	10.247 MW
StandardModelMix 07	436 kW	10.417 MW
Measurement	662 kW	6.972 MW

Reference Plant East



	max	total
NoSysLoss 07	4.952 MW	84.218 MW
StandardModelMix 07	3.084 MW	66.394 MW
Measurement	4.567 MW	56.711 MW

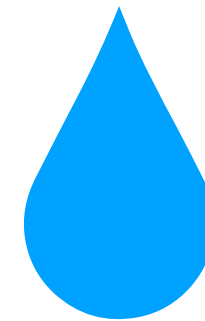
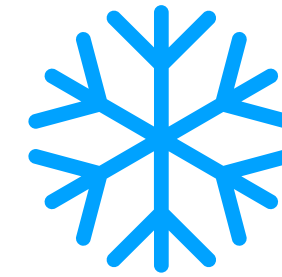
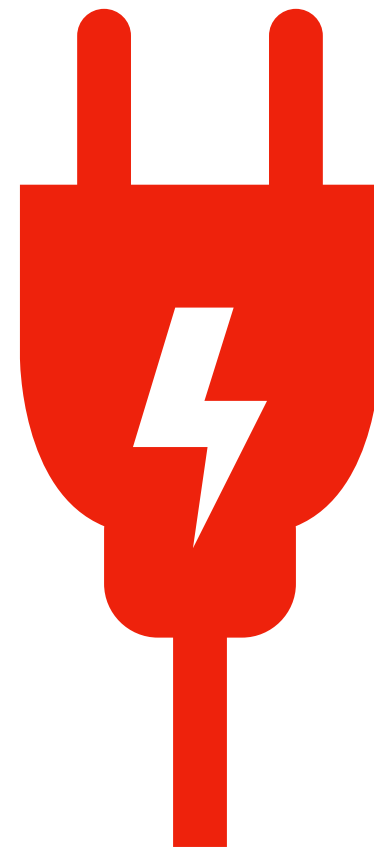
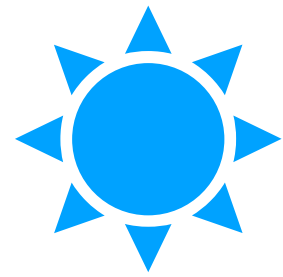
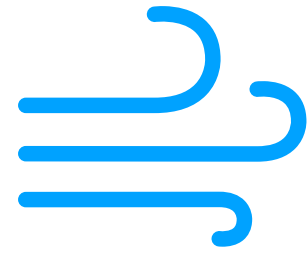
before Grafana



so many time series...

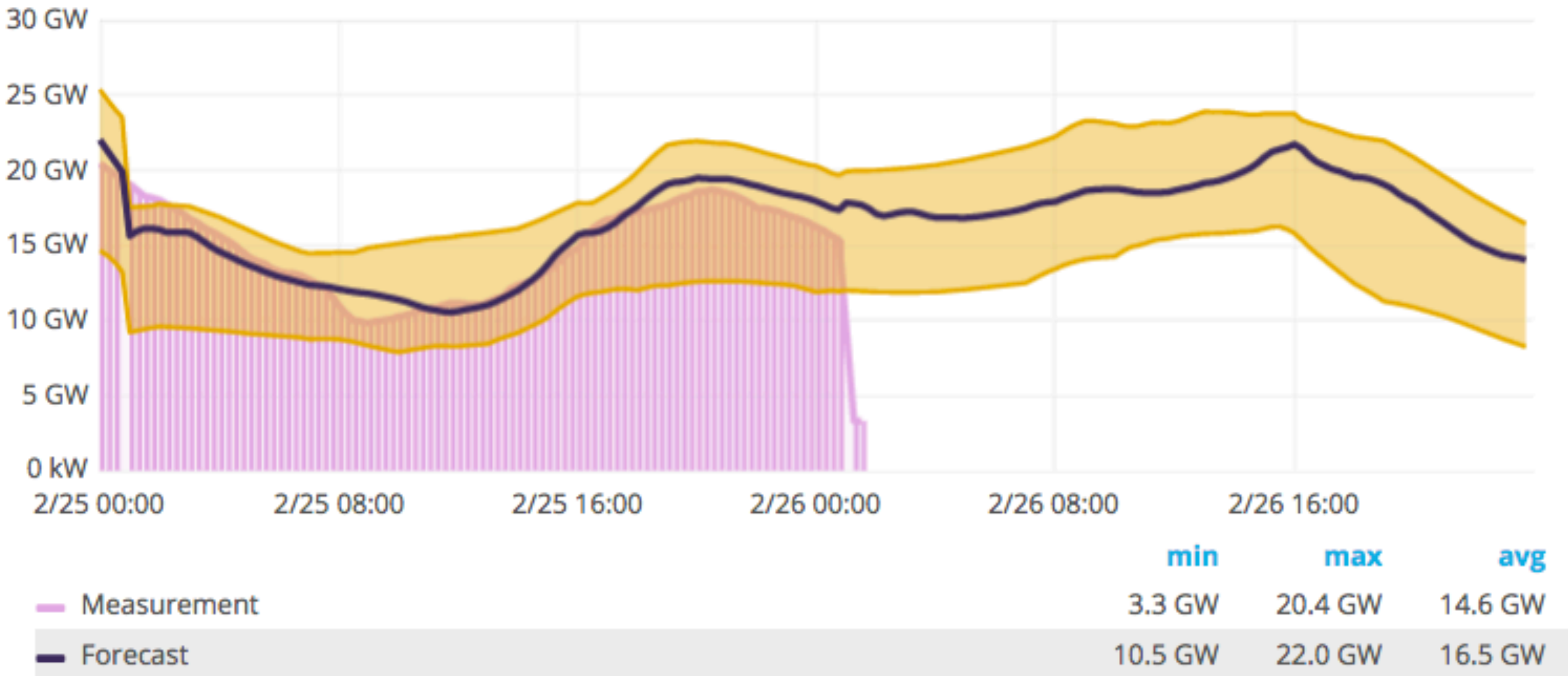
	Measurement	Forecast
example	load of 1 cpu core	temperature of 1 location
time series length	(very) long	rather short
time series resolution	high	low
# time series added per day for this example	0	24

weather impact on energy business

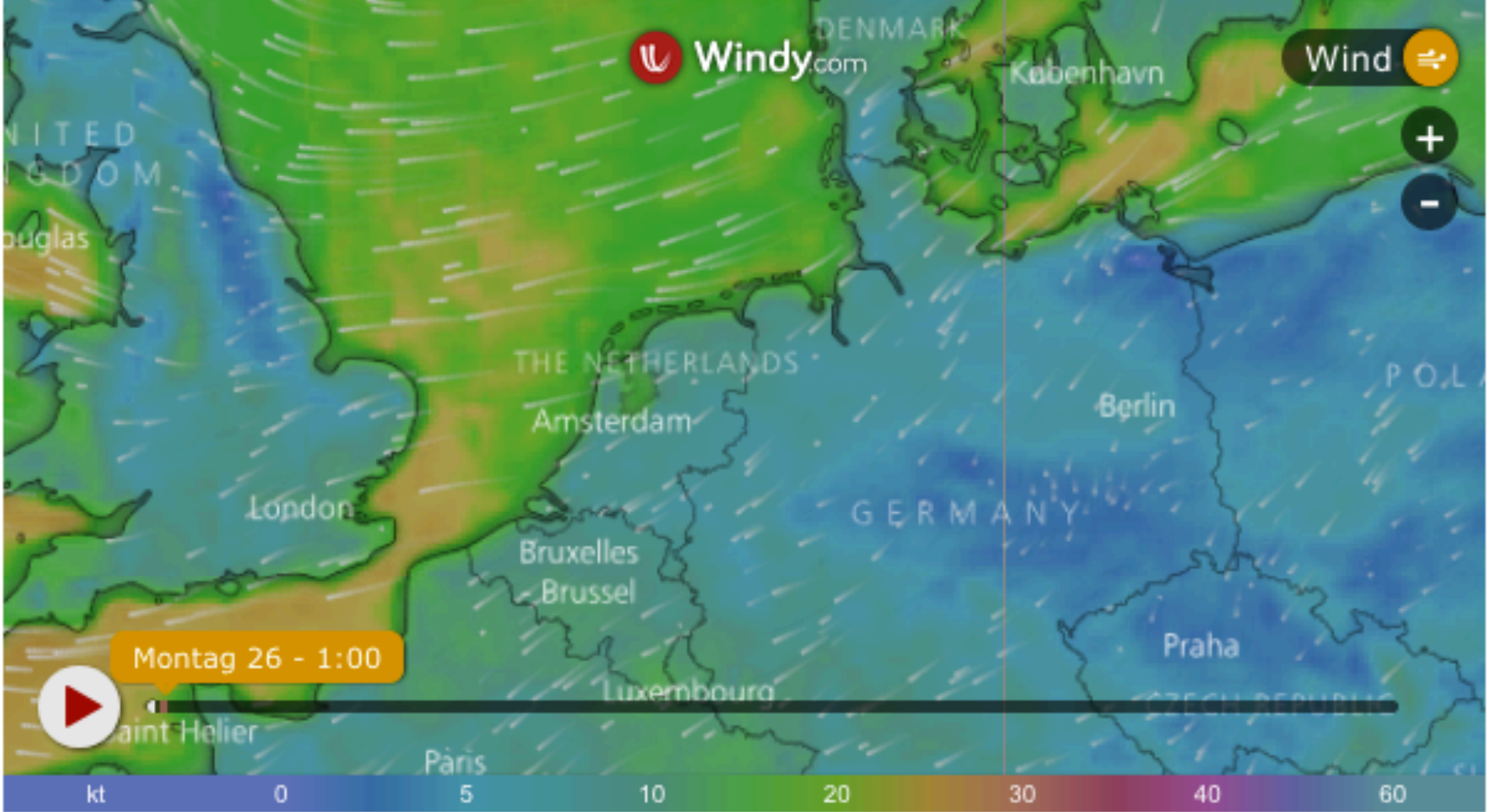


Renewables Forecast

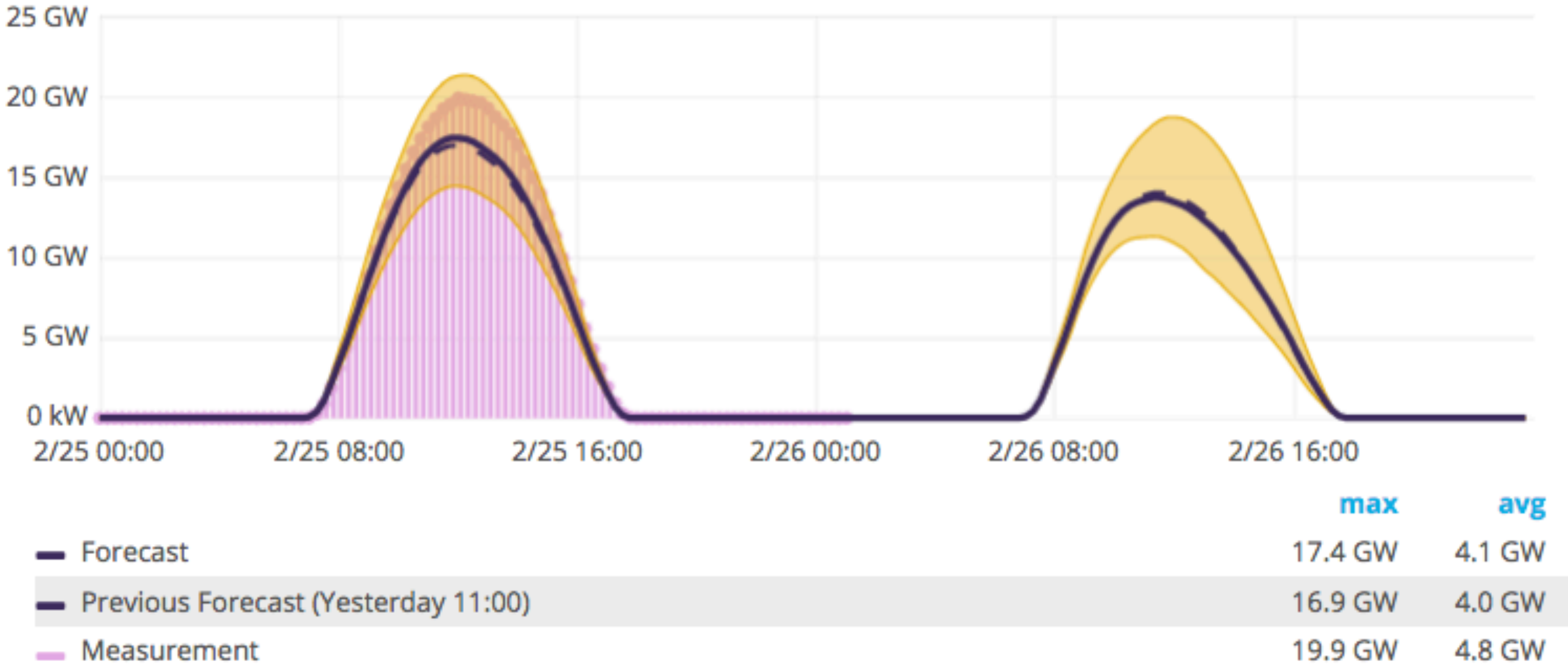
Windpower Forecast



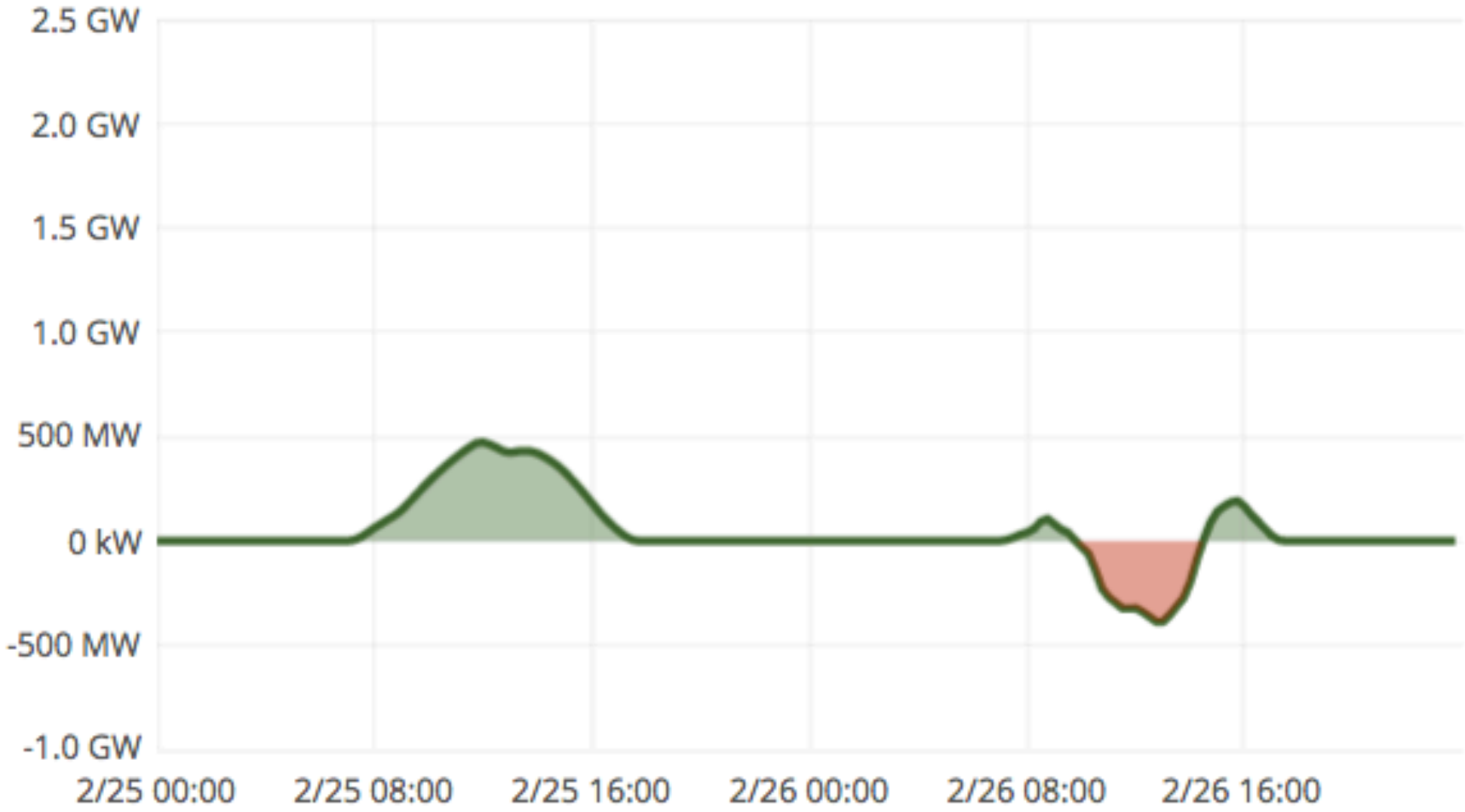
Live Wind from windy.com



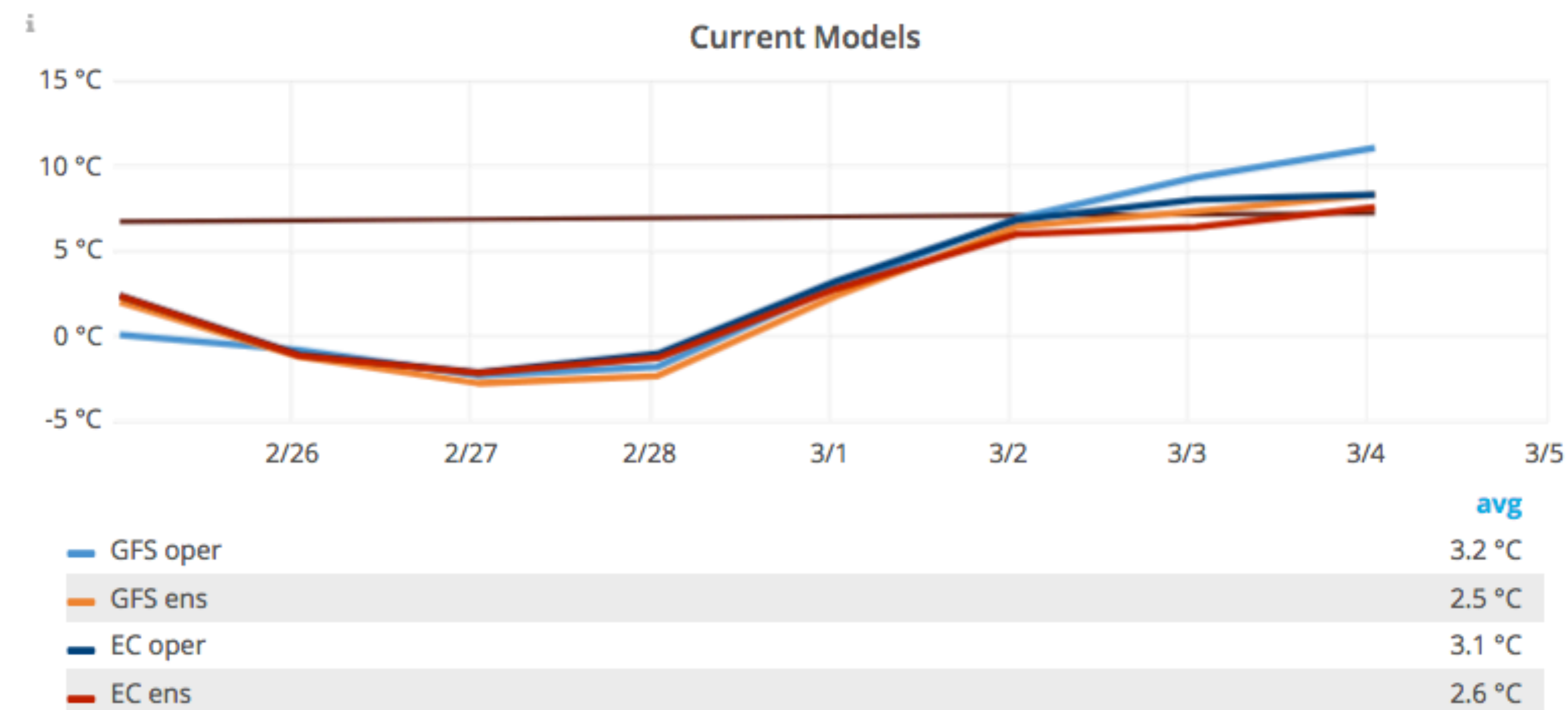
Solarpower Forecast



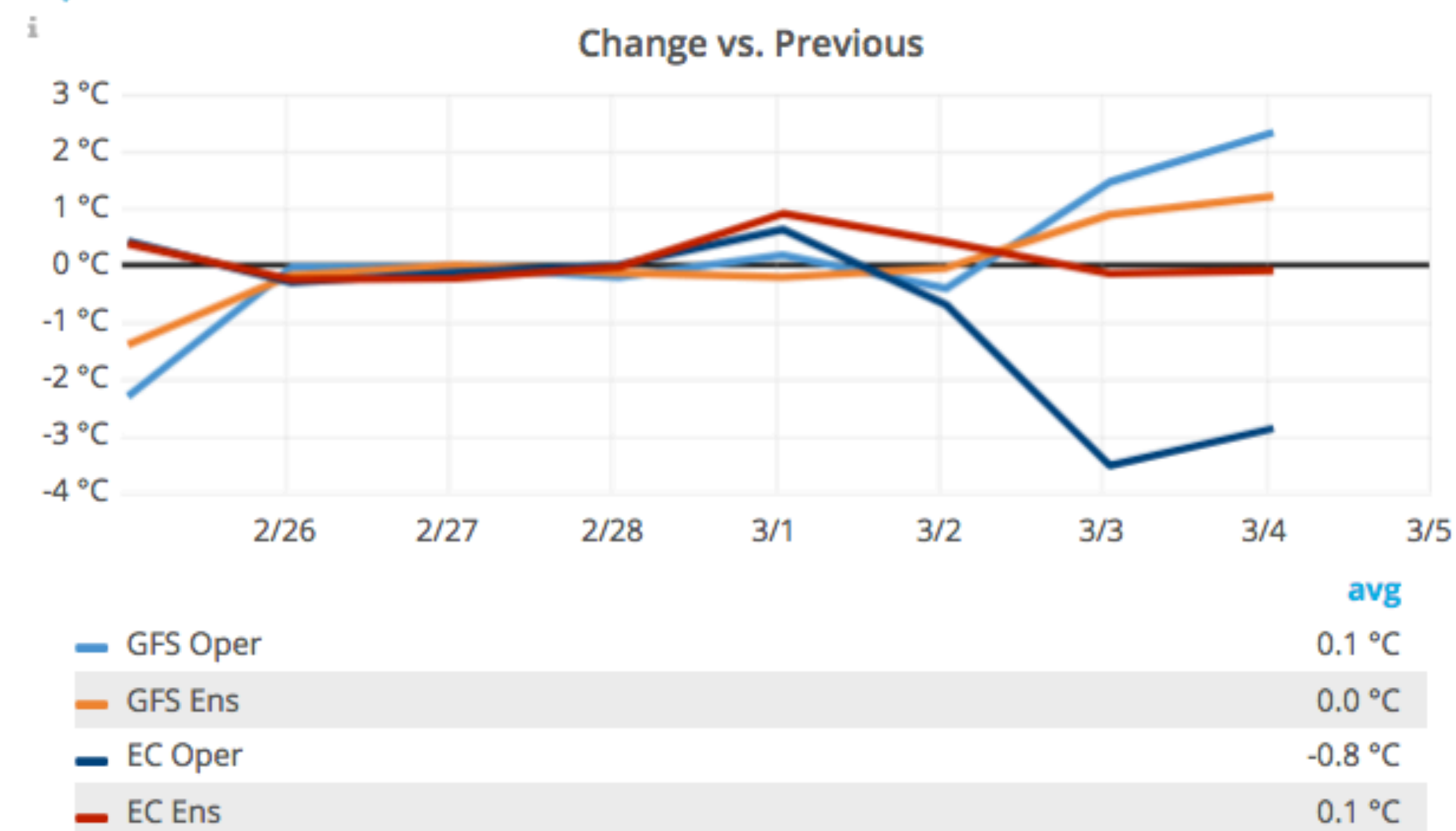
Change vs. Previous



Temperature Forecast



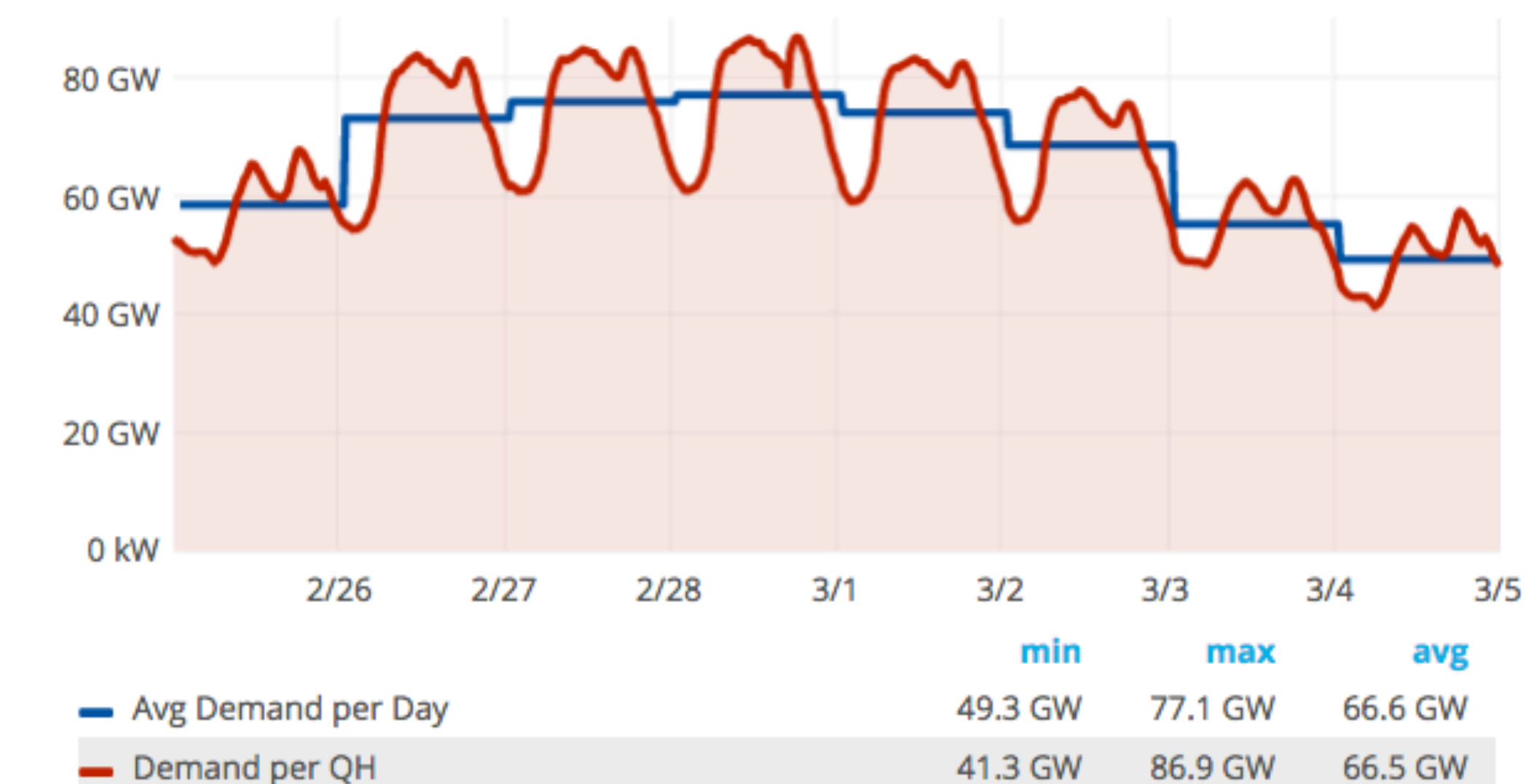
comparison of current model runs



Power Demand Anomaly

Time ▲	GFS OPER	GFS ENS	EC OPER	EC ENS
2018-02-25	14.6 GW	10.4 GW	9.5 GW	9.6 GW
2018-02-26	16.7 GW	17.6 GW	17.3 GW	17.4 GW
2018-02-27	20.1 GW	21.2 GW	19.7 GW	19.8 GW
2018-02-28	19.2 GW	20.3 GW	17.5 GW	18.0 GW
2018-03-01	8.9 GW	10.1 GW	8.2 GW	9.2 GW
2018-03-02	391.6 MW	1.4 GW	570.7 MW	2.4 GW
2018-03-03	-4.8 GW	-383.1 MW	-1.9 GW	1.7 GW
2018-03-04	-8.4 GW	-2.4 GW	-2.4 GW	-761.9 MW

Power Demand Forecast (absolute)



Renewables Analogy Model

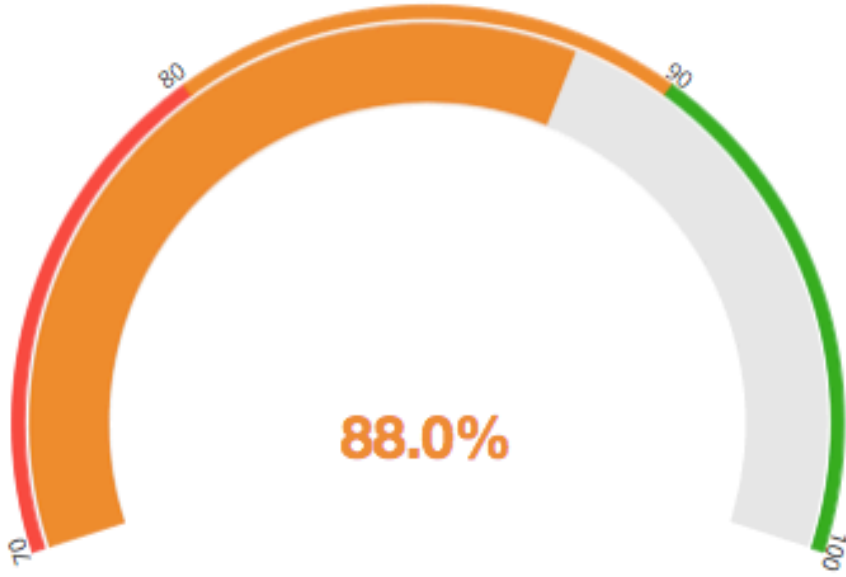
Die stetig ansteigende Bedeutung erneuerbarer Energien hat dazu geführt, dass Netzschwankungen vermehrt auftreten, Einspeisemanagement-Eingriffe erforderlich sind und starke Strompreisbewegungen zur Tagesordnung geworden sind. Durch eine eingehende Analyse der Wetter-Konditionen der vergangenen Jahre, lassen sich verschiedene Abhängigkeiten beobachten und quantifizieren, um den Einfluss erneuerbarer Energieträger besser einschätzen zu können. Dieses Dashboard soll mittels Analogieerkennung und -bewertung dabei helfen Preisrisiken aufzuzeigen und zu minimieren.

Analogy Key Figures:

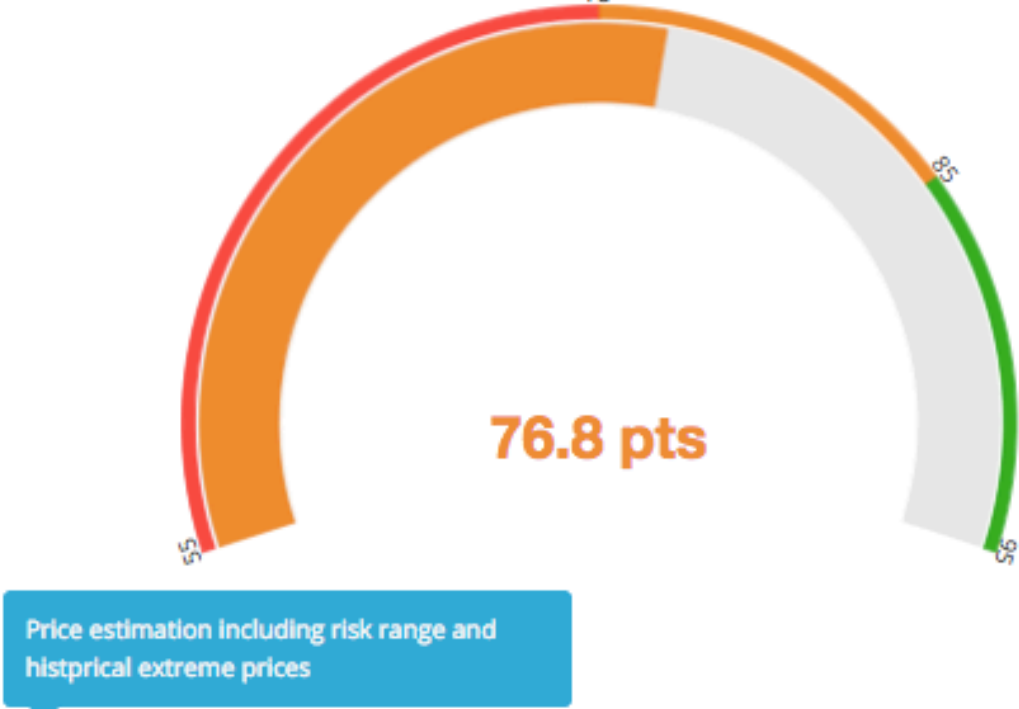
Run calculated 0days ago - for 2018/02/27

Analogy Dates		Analogy Correlation	Analogy Indicator
Matching Position ^	Date	Coefficient	Matching Number
01	2018-02-23	0.969	82.3
02	2015-11-24	0.891	80.3
03	2017-02-13	0.923	80.0
04	2015-03-04	0.947	78.8
05	2017-04-06	0.893	75.6
06	2015-12-11	0.897	74.6
07	2015-11-13	0.722	74.5
08	2018-02-14	0.871	74.4
09	2017-05-03	0.923	74.3
10	2017-01-13	0.765	73.3

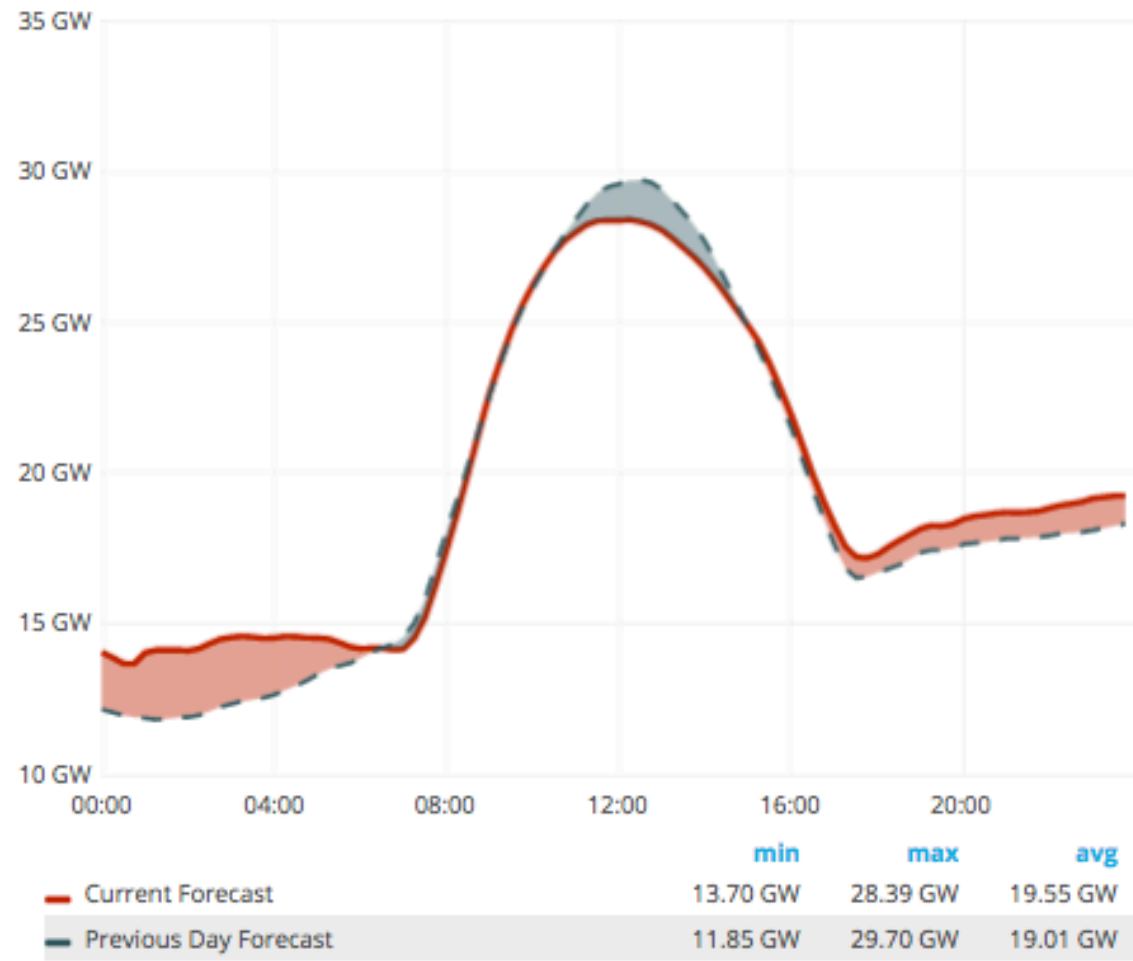
Average Analogy Correlation Coefficient



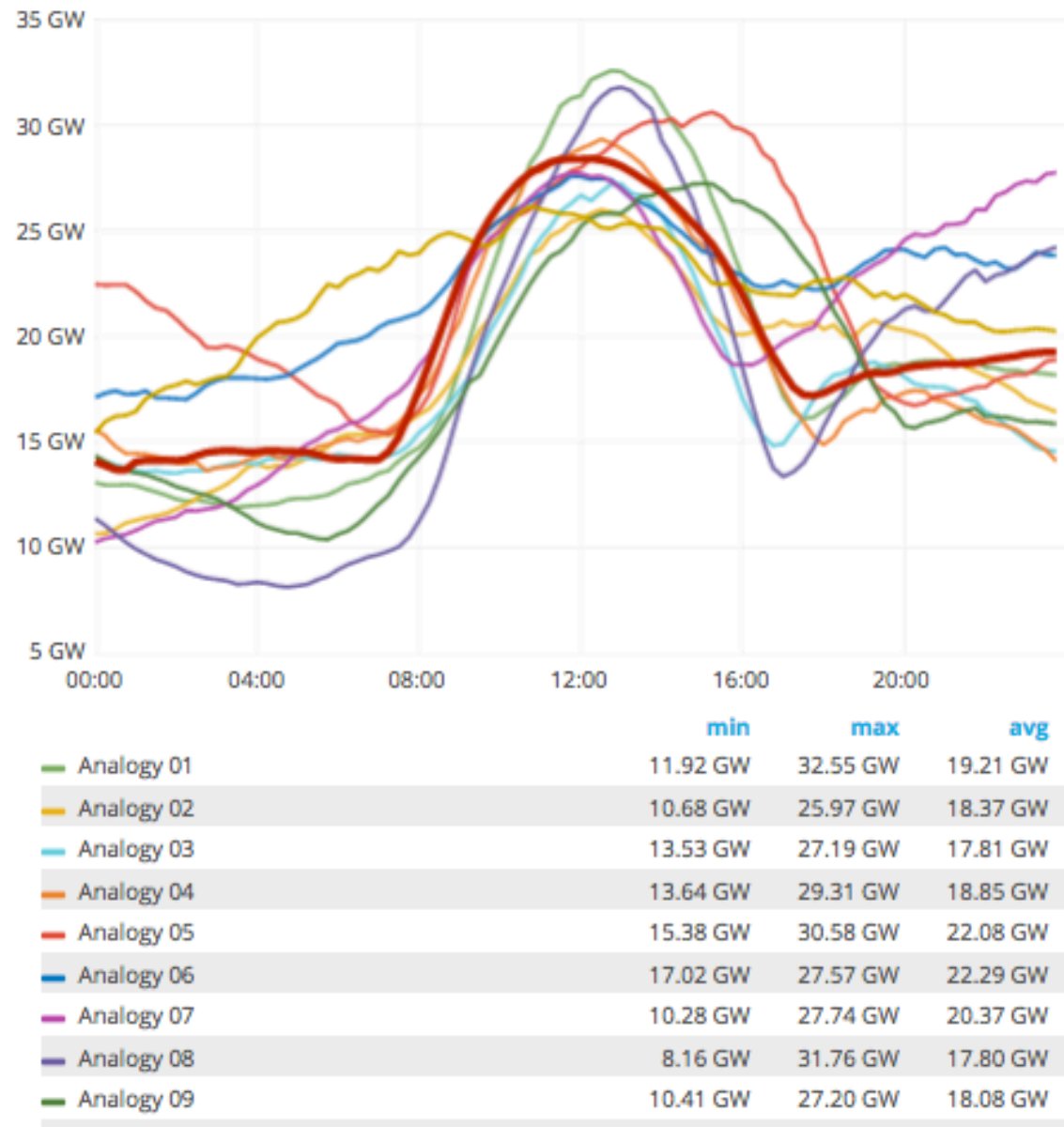
Average Analogy Matching Number



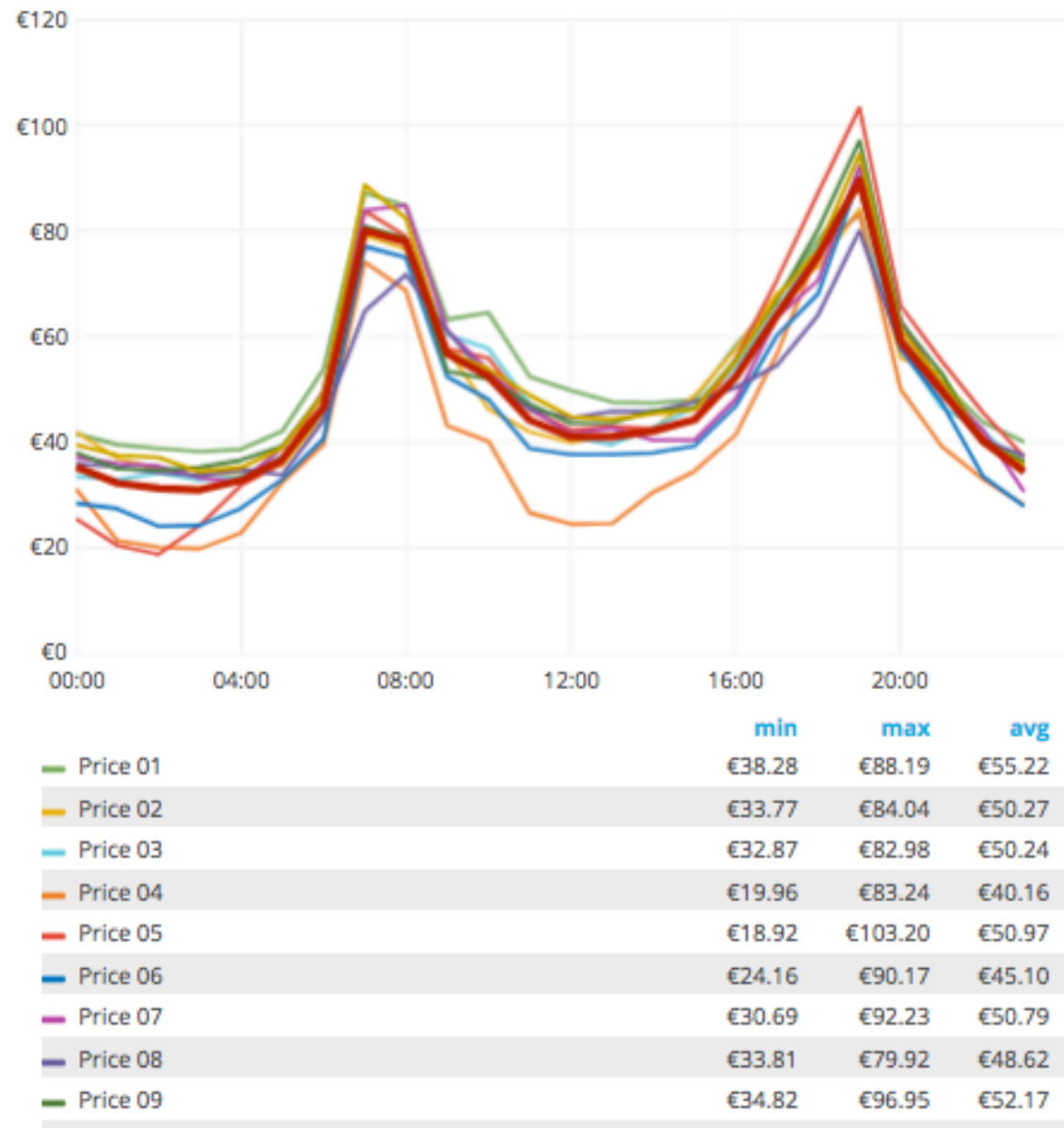
Current Forecast (Reference) vs. Previous Day



Analogies vs. Current (Reference)



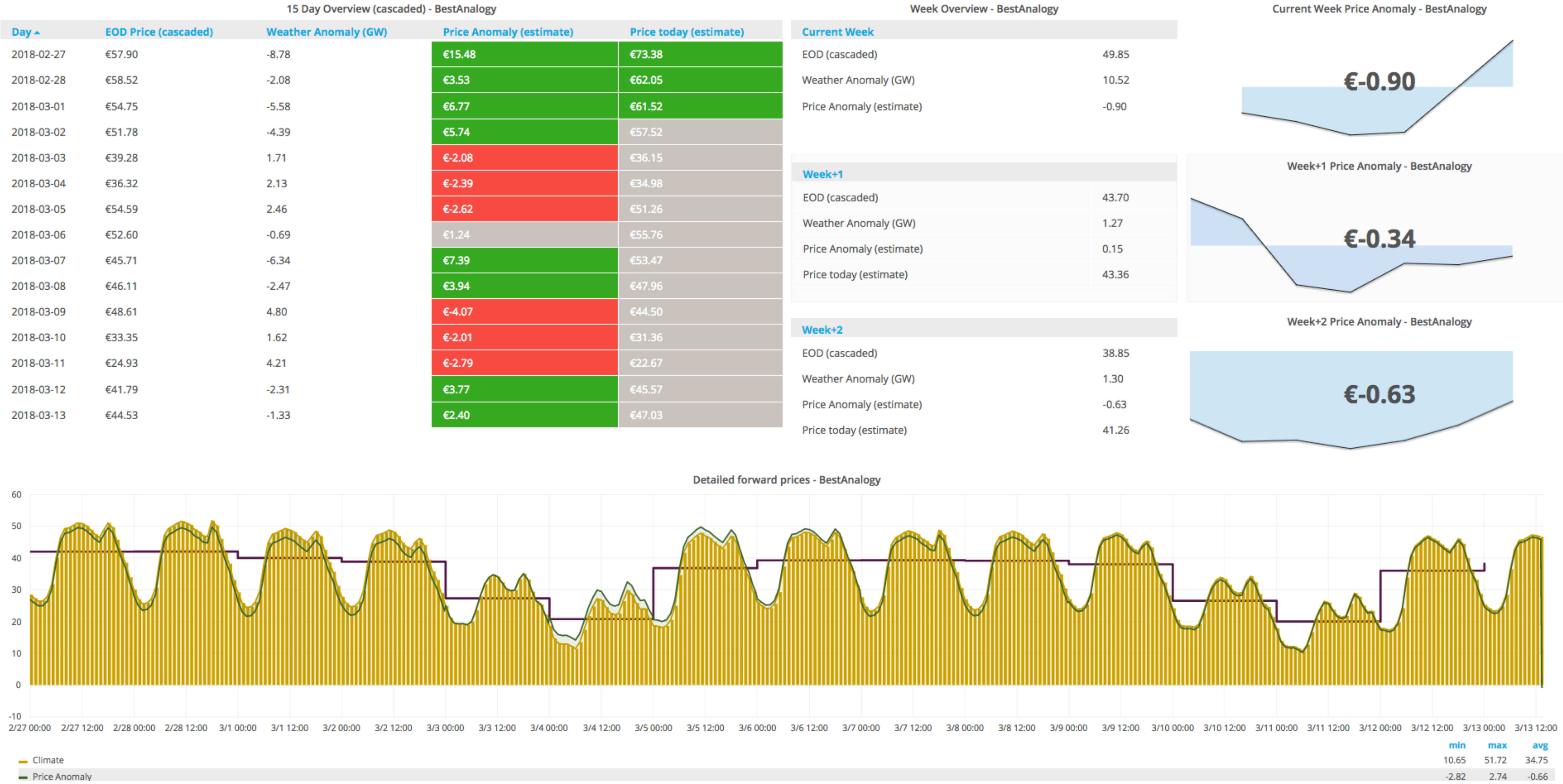
Price Analogies



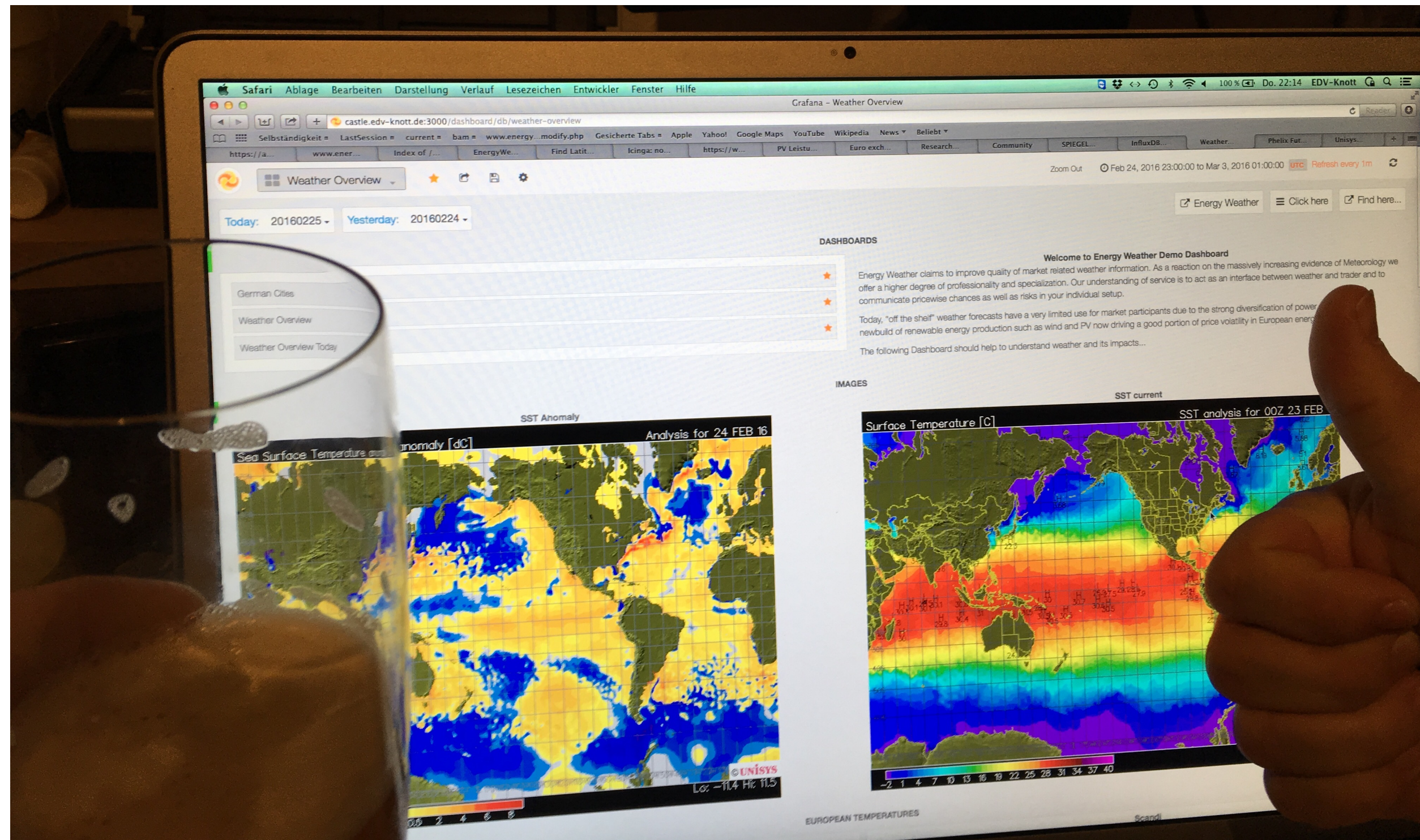
Prices Forecast & Risks



Weather Analogy vs. Best Mix (Usually updated at: 06:45, 07:45 and 09:45)



Weather, Power & Market Forecasts with Grafana



www.energyweather.com