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European Electricity Market Summary

Q2-2023

April to June

Generation and Contribution by Fuel Type

Renewables: 302.2TWh

Fossil Fuels: 152.2TWh

Nuclear: 142.4TWh

1 Quarterly Review of European Electricity Market Q2 2023

During the second quarter of 2023, the cost of electricity in the European markets mirrored the declining pattern of wholesale gas prices. Gas prices fell throughout the quarter, as Europe emerged from the winter season with exceptionally high gas reserves at the end of Q1 2023. This surplus in storage led to the market anticipation of an easier restocking process during the summer, compared to the previous summer. Consequently, these factors, along with the anticipation of weak economic growth, exerted a downward influence on the market gas prices. As a result, electricity prices also declined due to reduced generation costs. However, starting from early June, both gas and electricity prices started to rise due to increased competition for LNG shipments between Europe and Asia. Additionally, the extended maintenance period at the Nyhamna gas processing plant in Norway and the announcement of the Groningen gas field closure in the Netherlands during autumn further contributed to the price increase.

Alongside declining gas prices, improved nuclear availability in France and reduced demand contributed to the European power market continuing its recovery from the turbulent events of 2022. Wholesale power prices have declined to levels reminiscent of the summer of 2021. However, it is worth mentioning that the prices observed during the summer of 2021 were still significantly above historical norms.

Enduring high power prices have caused demand destruction over the last quarters. Demand across many markets is as low as during Covid. Next to demand destruction, the massive build out of behind-the-meter solar, has caused net demand to drop in many countries. Where published demand is not corrected for embedded solar by the local TSO, the netting effect of solar vs demand has dropped the demand numbers significantly. As a consequence, the requirement for conventional generation this quarter has been lower than in previous quarters.

Renewable generation was slightly higher from Q2 2022, increasing from ~290TWh to ~300TWh. During the quarter, the total wind generation reached ~94TWh, which was lower than the ~98TWh recorded in Q2 2022. However, it exceeded the ~89TWh generated in Q2 2021. Conversely, solar generation showcased a positive trend, reaching a significant ~71TWh. This surpassed the solar generation levels of any Q2, with sunnier weather and numbers reflecting growth of the installed capacity.

Due to a lower total demand this quarter, the utilisation of gas-fired power was materially low in comparison to recent quarters. NL Gas experienced a 14% decline this quarter compared to Q2 2022, primarily attributed to increased solar energy generation. Similarly, France witnessed a notable 44% decrease compared to Q2 2022, as a result of improvements in its nuclear fleet.

With the last nuclear plants closing in Germany and closures in Belgium, the overall nuclear generation in Europe has experienced a decline, despite the improvements observed in the French nuclear fleet and Finnish nuclear generation. In fact, this quarter's nuclear generation levels have reached the lowest point when compared to all previous quarters dating from 2015. While most European countries witnessed a decrease in nuclear generation, there were a few exceptions. Finland, France, Romania, Slovakia, and Slovenia were among the countries that bucked the trend, as they saw an increase in their nuclear generation during this period.

The key takeaways from this quarter are:

- **Extremely low levels of demand, comparable to the load factors observed in Q2 2020:** While it is typical for demand to be lower during this time of year compared to winter, this quarter's demand was even lower than any previous quarter. Total European demand, excluding ISEM and Slovakia, stood at approximately 600TWh¹, similar to the demand recorded in Q2 2020. This decline can be attributed to a combination of factors, including the significant changes in consumption patterns by both industrial users and consumers. These changes were a response to the persistently high prices witnessed in recent quarters, leading to a reduction in overall electricity demand.
- **French interconnector flows in net export position as the French nuclear fleet improves:** France has sustained its net power exports this quarter, recording a significant increase of over 400% compared to the previous quarter. This marks the second consecutive quarter of net exports, a notable shift from the four consecutive quarters of net imports observed in 2022. The shift in 2022 net imports was primarily caused by nuclear outages in France which has been improving since the start of 2023.
- **Gas prices in decline:** In addition to the decline in conventional generation this quarter, there was a notable decrease in TTF gas prices from April to early June, reaching a minimum of €22.63/MWh. However, during June, gas prices experienced a substantial increase, reaching a peak of €41.10/MWh due to extended maintenance at the Nyhamna gas

¹ **Note:** This figure is stated excluding data for I-SEM and Slovakia for which data has not yet been published by System Operators for those markets.

processing plant in Norway and the impending closure of the Groningen gas field by the Dutch government. Carbon prices followed a downward trend throughout the quarter, with EU ETS prices reaching a high of €94.86/te in early April and concluding the quarter at a low of €77.11/te.

- **Day-ahead and system prices in various European markets have been consistently negative, prompting European power exchanges to lower the negative price threshold triggering a second day-ahead auction to EUR -500/MWh.** The Nemo committee made this announcement on June 12th in response to extremely low prices observed primarily in the Dutch market, causing the pan-European day-ahead price to frequently dip below the threshold level of -EUR150/MWh. These negative prices were caused to increased solar generation from sunny weather and low demand, resulting in power prices dropping below zero for multiple hours across European countries. On May 18th, the Netherlands witnessed balancing prices nearing €-800/MWh during midday and afternoon, while on May 28th, both balancing and day-ahead prices remained below €-800/MWh, with the surrounding days also experiencing prices below EUR -150/MWh.

2 Day-ahead Price Trends

Table 1 below shows key statistics on pricing in the quarter and all previous quarters over the last seven years. The EPEX Day-ahead prices shown are averages across the quarter.

Table 1: EPEX Day-ahead quarterly average prices (EUR/MWh)

	BE	DE	DK (Ave)	ES	FR	GB	IT (Ave)	NL	NO 1-2-5	NO 3-4	SE 3-4	SE 1-2
Q1 2015	46.7	33.0	28.1	45.9	44.9	55.0	51.9	43.0	27.3	28.0	27.7	27.7
Q2 2015	41.4	28.3	23.0	48.4	32.6	58.1	47.6	39.1	20.0	20.9	20.8	20.8
Q3 2015	45.8	32.8	19.9	55.7	35.8	57.7	56.6	40.2	11.0	13.8	14.7	14.7
Q4 2015	44.8	33.2	23.8	51.2	40.6	52.0	52.5	37.9	21.2	20.8	21.6	21.6
Q1 2016	28.4	25.2	22.9	30.7	28.8	45.0	39.3	27.7	22.7	22.9	23.1	23.1
Q2 2016	27.1	24.8	25.7	29.5	25.9	44.5	36.3	28.4	22.8	24.1	26.4	26.4
Q3 2016	32.6	28.3	28.9	41.7	32.3	46.5	42.1	31.4	22.4	27.3	29.5	29.5
Q4 2016	58.1	37.6	34.6	56.5	59.8	60.1	53.1	41.4	33.7	33.1	36.7	36.7
Q1 2017	51.7	41.3	31.0	55.6	55.0	55.7	55.3	42.8	31.0	28.7	31.7	31.7
Q2 2017	35.7	29.8	28.7	47.0	33.9	46.6	46.4	34.6	27.1	26.2	28.5	28.5
Q3 2017	34.2	32.7	33.8	48.4	34.5	48.0	52.1	35.4	27.6	25.6	33.0	33.0
Q4 2017	56.8	33.1	30.6	58.0	56.5	56.6	61.0	44.5	29.9	30.0	30.2	30.2
Q1 2018	44.9	35.5	36.8	48.1	43.8	59.7	54.2	45.1	37.8	38.3	38.9	38.9
Q2 2018	44.1	36.0	39.7	52.0	36.8	60.1	55.0	46.1	38.7	39.7	38.5	38.5
Q3 2018	60.7	53.5	53.2	65.8	57.2	68.6	70.3	58.1	49.7	50.2	51.8	51.8
Q4 2018	71.1	52.6	50.4	63.0	62.7	71.0	68.3	60.6	46.8	47.1	47.4	47.4
Q1 2019	48.6	40.9	43.0	55.0	47.2	59.3	59.3	48.6	48.0	46.1	46.0	46.0
Q2 2019	34.5	35.8	36.9	48.7	34.9	47.1	52.3	39.1	37.0	35.3	33.0	33.0
Q3 2019	35.0	37.4	38.0	46.2	35.5	42.7	52.9	37.9	33.2	34.7	35.3	35.3
Q4 2019	39.4	36.6	38.9	41.0	40.3	46.7	48.5	39.3	39.0	37.7	37.5	37.5
Q1 2020	30.1	26.6	21.2	34.9	29.4	38.0	40.4	30.5	15.1	15.4	15.6	15.6
Q2 2020	18.5	20.3	20.5	23.2	18.0	27.3	25.2	20.9	4.5	5.6	8.2	8.2
Q3 2020	36.5	36.1	33.9	37.5	39.0	40.2	43.9	35.3	4.8	5.7	18.6	18.6
Q4 2020	42.3	38.8	31.0	40.1	42.2	52.6	49.5	42.1	12.6	10.0	15.1	15.1
Q1 2021	51.0	49.6	49.1	45.2	53.0	72.5	58.8	50.6	46.8	35.5	37.5	37.5
Q2 2021	62.3	60.3	58.7	71.8	63.9	83.8	77.2	62.1	47.2	30.0	33.1	33.1
Q3 2021	97.3	97.1	96.0	117.8	96.6	150.3	126.2	101.5	77.8	45.1	54.8	54.8
Q4 2021	204.3	178.9	147.1	211.0	221.4	241.9	237.4	196.0	126.4	41.5	44.5	44.5
Q1 2022	208.0	184.6	152.6	229.4	232.2	240.1	246.0	207.5	151.4	20.1	24.8	24.8
Q2 2022	193.9	187.0	179.6	182.8	226.0	183.4	247.0	195.5	167.1	18.6	51.7	51.7
Q3 2022	372.3	375.8	347.9	146.3	429.7	344.9	461.6	365.4	309.7	22.4	49.0	49.0
Q4 2022	202.6	192.8	176.5	113.2	214.1	197.3	236.3	198.0	164.8	71.3	115.6	115.6
Q1 2023	127.4	115.8	103.1	96.4	130.4	144.5	152.9	121.4	107.8	47.4	53.4	53.4
Q2 2023	92.8	92.3	83.8	80.3	91.6	101.9	114.8	89.4	77.9	29.9	42.3	42.3

3 Generation Activity Overview

Table 2: Quarterly generation summary

	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Q2 2023
TOTAL GENERATION BY FUEL (TWh)									
Biomass	24.5	22.0	25.5	23.9	21.3	22.9	23.5	24.2	18.5
Coal/Lignite	89.8	110.5	132.6	126.2	101.5	118.5	122.4	109.4	67.5
Gas	121.4	120.0	153.0	148.8	122.6	142.8	137.0	106.2	82.5
Hydro	127.8	110.9	110.5	109.3	107.3	91.4	110.2	118.4	114.9
Nuclear	174.7	184.0	194.5	190.7	149.5	146.0	158.8	172.4	142.4
Oil	3.4	3.3	3.6	3.2	1.9	2.2	2.7	3.1	1.9
Peat	0.8	0.6	1.4	1.5	1.1	0.5	0.9	1.1	0.4
Solar	52.7	50.3	19.9	29.5	63.9	63.3	23.3	30.9	70.8
Waste	4.1	4.2	4.2	4.2	3.8	3.8	3.8	3.7	3.6
Wind	88.6	77.5	135.4	153.6	97.9	84.0	137.2	159.5	94.4
FOSSIL FUELS	215.4	234.4	290.6	279.8	227.1	264.0	263.1	219.7	152.2
NUCLEAR	174.7	184.0	194.5	190.7	149.5	146.0	158.8	172.4	142.4
RENEWABLE (INCLUDES WASTE)	297.6	264.9	295.5	320.5	294.2	265.3	298.0	336.7	302.2
TOTAL	687.8	683.3	780.6	790.9	670.8	675.4	719.9	728.8	596.8
Fossil Fuel Percentage									
Fossil Fuel Percentage	31%	34%	37%	35%	34%	39%	37%	30%	26%
Clean Percentage									
Clean Percentage	69%	66%	63%	65%	66%	61%	63%	70%	74%
Renewable Share of Clean Power									
Renewable Share of Clean Power	63%	59%	60%	63%	66%	65%	65%	66%	68%
SHARE OF GENERATION (%)									
Biomass	3.6%	3.2%	3.3%	3.0%	3.2%	3.4%	3.3%	3.3%	3.1%
Coal/Lignite	13.1%	16.2%	17.0%	16.0%	15.1%	17.6%	17.0%	15.0%	11.3%
Gas	17.6%	17.6%	19.6%	18.8%	18.3%	21.1%	19.0%	14.6%	13.8%
Hydro	18.6%	16.2%	14.2%	13.8%	16.0%	13.5%	15.3%	16.2%	19.2%
Nuclear	25.4%	26.9%	24.9%	24.1%	22.3%	21.6%	22.1%	23.7%	23.9%
Oil	0.5%	0.5%	0.5%	0.4%	0.3%	0.3%	0.4%	0.4%	0.3%
Peat	0.1%	0.1%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%
Solar	7.7%	7.4%	2.5%	3.7%	9.5%	9.4%	3.2%	4.2%	11.9%
Waste	0.6%	0.6%	0.5%	0.5%	0.6%	0.6%	0.5%	0.5%	0.6%
Wind	12.9%	11.3%	17.3%	19.4%	14.6%	12.4%	19.1%	21.9%	15.8%
FOSSIL FUELS	31.2%	34.2%	37.0%	35.2%	33.7%	39.0%	36.4%	30.0%	25.4%
NUCLEAR	25.4%	26.9%	24.9%	24.1%	22.3%	21.6%	22.1%	23.7%	23.9%
RENEWABLE (INCLUDES WASTE)	43.3%	38.8%	37.9%	40.5%	43.9%	39.3%	41.4%	46.2%	50.6%

Table 3: Year-on-year comparison of Q2 generation (TWh and %)

	Q2 2018	Q2 2019	Q2 2020	Q2 2021	Q2 2022	Q2 2023
TOTAL GENERATION BY FUEL (TWh)						
Biomass	22.0	22.1	23.9	24.5	21.3	18.5
Coal/Lignite	125.1	100.9	71.4	89.8	101.5	67.5
Gas	89.6	120.4	106.1	121.4	122.6	82.5
Hydro	134.6	116.7	125.7	127.8	107.3	114.9
Nuclear	187.4	188.6	160.1	174.7	149.5	142.4
Oil	3.0	2.9	3.2	3.4	1.9	1.9
Peat	1.4	1.2	0.7	0.8	1.1	0.4
Solar	39.1	39.9	48.8	52.7	63.9	70.8
Waste	3.4	3.5	3.4	4.1	3.8	3.6
Wind	70.5	81.4	83.1	88.6	97.9	94.4
FOSSIL FUELS	219.0	225.4	181.5	215.4	227.1	152.2
NUCLEAR	187.4	188.6	160.1	174.7	149.5	142.4
RENEWABLE (INCLUDES WASTE)	269.6	263.5	285.0	297.6	294.2	302.2
TOTAL	676.0	677.5	626.6	687.8	670.8	596.8
Fossil Fuel Percentage	32%	33%	29%	31%	34%	26%
Clean Percentage	68%	67%	71%	69%	66%	74%
Renewable Share of Clean Power	59%	58%	64%	63%	66%	68%
CHANGE SINCE Q1 2017 (%)						
Biomass		0%	9%	11%	-4%	-16%
Coal/Lignite		-19%	-43%	-28%	-19%	-46%
Gas		34%	18%	36%	37%	-8%
Hydro		-13%	-7%	-5%	-20%	-15%
Nuclear		1%	-15%	-7%	-20%	-24%
Oil		-3%	6%	14%	-36%	-37%
Peat		-17%	-47%	-43%	-24%	-71%
Solar		2%	25%	35%	64%	81%
Waste		5%	2%	22%	14%	8%
Wind		15%	18%	26%	39%	34%
FOSSIL FUELS		3%	-17%	-2%	4%	-31%
NUCLEAR		1%	-15%	-7%	-20%	-24%
RENEWABLE (INCLUDES WASTE)		-2%	6%	10%	9%	12%

4 Notes on the Report

The figures used in the report refer to data provided through ENTSO-E for the period from 2015 which have been aggregated by EnAppSys into a European total. This data does sometimes suffer from outages or gaps in reporting, but it is considered generally complete. This report is based on the most recently available data as at quarter and year ends. National Grid data is used for GB demand.

Included Countries

Albania	Germany	Norway
Austria	Great Britain	Poland
Belgium	Greece	Portugal
Bosnia & Herzegovina	Hungary	Romania
Bulgaria	I-SEM	Serbia
Croatia	Italy	Slovakia
Czech Republic	Latvia	Slovenia
Denmark	Lithuania	Spain
Estonia	Montenegro	Sweden
Finland	Netherlands	Switzerland
France	North Macedonia	

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*This report has been created using our pan-European **market data platform**, which has flexible configurable screens and automated data feeds. If you would like to gain more detailed information and insight, please contact us to arrange trial access to the platform via: sales@enappsys.com*

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