

**EnAppSys**  
ENERGY INSIGHT

# European Electricity Fuel Mix Summary

**Q2 2019**

**April to June**

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**Renewables:** 245.8TWh (-7%)

**Fossil Fuels:** 202.7TWh (-13%)

**Nuclear:** 176.3TWh (-14%)

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## Contents

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Contents	
Q2 2019	
Executive Summary	1
Fuel Activity Overview	2
Statistics	3
Renewables	5
Statistics	5
Notes on the Report	7

## Executive Summary

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For the second year running renewables produced more power than fossil fuels in both the first and second quarters of the year. This came despite a 3% drop in levels of renewable generation to the second quarter of 2019 – from April through to June – from the same period in 2018.

This came as overall levels of generation also fell over the same period with this meaning that the drop in renewable generation was not significant.

This comes about as the state of the power fuel mix across Europe has largely stabilised, with levels of renewables no longer seeing large increases and with the balance between coal and gas largely staying static.

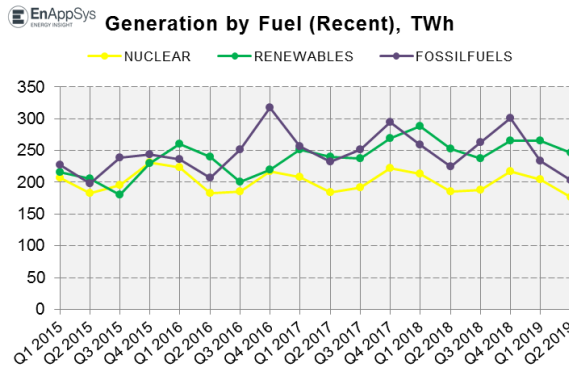
This means that the share of generation from fossil fuels, renewables and nuclear have largely remained static since 2017, with renewables providing more than fossil fuels in the first half of the year and with this switching in the second half the year.

This means that solar produced only 38% as much power as coal / lignite plants in the quarter, with this only increasing to 78% for wind. These levels are high given that coal and lignite are dirty sources of power generation and the continued high levels of coal generation have contributed to these levels.

One of the challenges around these figures are the difficulties in finding finance and subsidy support for renewable projects, but also due to the challenges of switching from coal to gas in regions in which domestic gas supplies and gas infrastructure is low.

In the quarter nuclear plants produced 28.2% of generation, hydro 17.5%, gas 17.0%, coal / lignite 14.7%, wind 11.5%, solar 6.5%, biomass 3.4%, oil 0.6%, waste 0.5% and peat 0.1%.

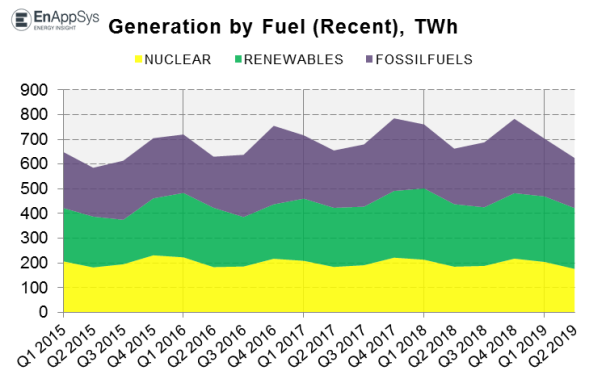




A slightly smaller share of generation (17.0%) came from gas-fired power plants which saw levels of output drop by 9% from the previous quarter, but rise by 17% from Q2 2018.

This is followed by coal / lignite plants which continue to generate a high share of generation at 14.7%, with this amounting to 92.1TWh, down 17% from the previous quarter. These coal / lignite levels are down 28% from Q2 2018, but remain only 22% down from the Q2 2016 levels. This means that a large share of European electricity continues to be generated from these dirty fuel sources.

The highest renewable source of electricity generation in the European power markets are wind farms, which produced 11.5% of power generation, with this being up 25% from Q2 2018 as wind farms bounced back from low levels of generation in Q2 2018.



The next largest source of generation was from solar projects which produced 6.5% of generation, with this being 8% down from the record levels of solar generation achieved in Q2 2018.

Biomass plants generated 21.3TWh in the quarter and this was followed up by 3.5TWh from oil, 3.2TWh from waste and 0.9TWh from peat.

On a simplified basis 39% of generation came from renewables, 32% from fossil fuels and 28% from nuclear plants.

Looking in more detail, 28% came from nuclear plants, 18% from gas plants, 17% from hydro, 15% from coal/lignite, 12% from wind, 7% from solar, 3% from biomass and the remaining amount from oil, peat and waste.

**Statistics**

The following tables contain some of the key statistics relating to the quarter:

	Q2 2017	Q3 2017	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Q1 2019	Q2 2019
<b>TOTAL GENERATION BY FUEL (TWh)</b>									
Biomass	18.0	18.1	23.3	23.3	21.4	22.6	25.1	23.6	21.3
Coal/Lignite	131.2	142.2	157.6	147.3	128.6	145.9	156.6	110.9	92.1
Gas	94.5	103.7	129.7	104.7	90.9	111.2	138.1	117.0	106.2
Hydro	113.1	109.4	118.0	139.6	126.9	95.9	112.7	104.7	109.2
Nuclear	183.9	191.1	221.6	213.3	185.0	188.4	217.6	204.4	176.3
Oil	5.3	5.1	5.2	5.2	4.2	4.2	4.1	4.0	3.5
Peat	1.1	0.8	1.4	1.7	1.1	1.5	2.0	1.7	0.9
Solar	40.2	29.2	9.9	24.5	43.8	32.6	10.1	27.9	40.5
Waste	3.5	3.6	3.6	3.7	3.2	4.0	4.0	3.6	3.2
Wind	64.6	76.6	115.0	97.3	57.4	82.0	112.9	105.4	71.6
<b>FOSSIL FUELS</b>	<b>232.0</b>	<b>251.8</b>	<b>294.0</b>	<b>258.9</b>	<b>224.8</b>	<b>262.7</b>	<b>300.8</b>	<b>233.6</b>	<b>202.7</b>
<b>NUCLEAR</b>	<b>183.9</b>	<b>191.1</b>	<b>221.6</b>	<b>213.3</b>	<b>185.0</b>	<b>188.4</b>	<b>217.6</b>	<b>204.4</b>	<b>176.3</b>
<b>RENEWABLE (INCLUDES WASTE)</b>	<b>239.4</b>	<b>236.8</b>	<b>269.8</b>	<b>288.4</b>	<b>252.8</b>	<b>237.1</b>	<b>264.8</b>	<b>265.2</b>	<b>245.8</b>
<b>TOTAL</b>	<b>655.3</b>	<b>679.7</b>	<b>785.4</b>	<b>760.6</b>	<b>662.7</b>	<b>688.1</b>	<b>783.2</b>	<b>703.3</b>	<b>624.8</b>
Fossil Fuel Percentage	35%	37%	37%	34%	34%	38%	38%	33%	32%
Clean Percentage	65%	63%	63%	66%	66%	62%	62%	67%	68%
Renewable Share of Clean Power	57%	55%	55%	57%	58%	56%	55%	56%	58%
<b>SHARE OF GENERATION (%)</b>									
Biomass	2.7%	2.7%	3.0%	3.1%	3.2%	3.3%	3.2%	3.4%	3.4%
Coal/Lignite	20.0%	20.9%	20.1%	19.4%	19.4%	21.2%	20.0%	15.8%	14.7%
Gas	14.4%	15.3%	16.5%	13.8%	13.7%	16.2%	17.6%	16.6%	17.0%
Hydro	17.3%	16.1%	15.0%	18.4%	19.2%	13.9%	14.4%	14.9%	17.5%
Nuclear	28.1%	28.1%	28.2%	28.0%	27.9%	27.4%	27.8%	29.1%	28.2%
Oil	0.8%	0.8%	0.7%	0.7%	0.6%	0.6%	0.5%	0.6%	0.6%
Peat	0.2%	0.1%	0.2%	0.2%	0.2%	0.2%	0.3%	0.2%	0.1%
Solar	6.1%	4.3%	1.3%	3.2%	6.6%	4.7%	1.3%	4.0%	6.5%
Waste	0.5%	0.5%	0.5%	0.5%	0.5%	0.6%	0.5%	0.5%	0.5%
Wind	9.9%	11.3%	14.6%	12.8%	8.7%	11.9%	14.4%	15.0%	11.5%
<b>TOTAL GENERATION BY FUEL (TWh)</b>									
Biomass					15.6	16.8	18.0	21.4	21.3
Coal/Lignite					137.0	119.3	131.2	128.6	92.1
Gas					56.2	81.9	94.5	90.9	106.2
Hydro					101.7	130.8	113.1	126.9	109.2
Nuclear					182.3	183.3	183.9	185.0	176.3
Oil					3.4	4.7	5.3	4.2	3.5
Peat					1.1	1.0	1.1	1.1	0.9
Solar					30.3	36.1	40.2	43.8	40.5
Waste					2.3	2.6	3.5	3.2	3.2
Wind					55.5	53.6	64.6	57.4	71.6
<b>FOSSIL FUELS</b>					<b>197.7</b>	<b>206.8</b>	<b>232.0</b>	<b>224.8</b>	<b>202.7</b>
<b>NUCLEAR</b>					<b>182.3</b>	<b>183.3</b>	<b>183.9</b>	<b>185.0</b>	<b>176.3</b>
<b>RENEWABLE (INCLUDES WASTE)</b>					<b>205.4</b>	<b>240.0</b>	<b>239.4</b>	<b>252.8</b>	<b>245.8</b>
<b>TOTAL</b>					<b>585.4</b>	<b>630.2</b>	<b>655.3</b>	<b>662.7</b>	<b>624.8</b>
Fossil Fuel Percentage					34%	33%	35%	34%	32%
Clean Percentage					66%	67%	65%	66%	68%
Renewable Share of Clean Power					53%	57%	57%	58%	58%
<b>CHANGE SINCE Q1 2015 (%)</b>									
Biomass						8%	16%	38%	37%
Coal/Lignite						-13%	-4%	-6%	-33%
Gas						46%	68%	62%	89%
Hydro						29%	11%	25%	7%
Nuclear						1%	1%	2%	-3%
Oil						37%	56%	23%	2%
Peat						-6%	-4%	2%	-17%
Solar						19%	33%	45%	34%
Waste						14%	50%	40%	39%
Wind						-3%	16%	3%	29%
<b>FOSSIL FUELS</b>						<b>5%</b>	<b>17%</b>	<b>14%</b>	<b>3%</b>
<b>NUCLEAR</b>						<b>1%</b>	<b>1%</b>	<b>2%</b>	<b>-3%</b>
<b>RENEWABLE (INCLUDES WASTE)</b>						<b>17%</b>	<b>17%</b>	<b>23%</b>	<b>20%</b>

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## Renewables

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The quarter saw 245.8TWh from renewables, with this being down 3% from the levels in Q2 2018.

The largest share of renewable generation came from hydro plants which are set to remain the dominant renewable fuel source in Europe for the foreseeable future. These hydro plants generated 109.2TWh, with this being 44.4% of all renewable generation. Despite this, these levels were down 14% from the hydro generation in Q2 2018 and this drop was a key factor in the overall decline in renewable generation.

The second largest source of renewable generation in the quarter and the only renewable source considered to see an increase in generation year-on-year were wind farms.

These generated 71.6TWh and produced 29.1% of all renewable generation, with the wind generation levels bouncing back from low levels in Q2 2018, but with this being a more modest rise of 11% from Q2 2017.

Solar farms produced the next highest share of generation at 40.5TWh and 16.5% of the total. These levels were down from the record high for a quarter achieved in Q2 2018, with solar generation levels starting to flatten out across European markets.

The remainder of renewable generation came from biomass (8.7%) and waste (1.3%). These two sources generated 21.3TWh and 3.2TWh respectively.

In the quarter, 44.4% of renewable power came from hydro projects, 29.1% from wind, 16.5% from solar, 8.7% from biomass and the remaining amount from waste to energy.

### Statistics

The following table contains some of the key statistics relating to the quarter:

	Q2 2017	Q3 2017	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Q1 2019	Q2 2019
<b>TOTAL GENERATION BY FUEL (TWh)</b>									
Biomass	18.0	18.1	23.3	23.3	21.4	22.6	25.1	23.6	21.3
Hydro	113.1	109.4	118.0	139.6	126.9	95.9	112.7	104.7	109.2
Solar	40.2	29.2	9.9	24.5	43.8	32.6	10.1	27.9	40.5
Waste	3.5	3.6	3.6	3.7	3.2	4.0	4.0	3.6	3.2
Wind	64.6	76.6	115.0	97.3	57.4	82.0	112.9	105.4	71.6
<b>TOTAL</b>	<b>239.4</b>	<b>236.8</b>	<b>269.8</b>	<b>288.4</b>	<b>252.8</b>	<b>237.1</b>	<b>264.8</b>	<b>265.2</b>	<b>245.8</b>
Primary Renewable Source	HYDRO	HYDRO	HYDRO	HYDRO	HYDRO	HYDRO	WIND	WIND	HYDRO
<b>SHARE OF RENEWABLES (%)</b>									
Biomass	7.5%	7.6%	8.6%	8.1%	8.5%	9.5%	9.5%	8.9%	8.7%
Hydro	47.2%	46.2%	43.7%	48.4%	50.2%	40.4%	42.6%	39.5%	44.4%
Solar	16.8%	12.3%	3.7%	8.5%	17.3%	13.8%	3.8%	10.5%	16.5%
Waste	1.4%	1.5%	1.3%	1.3%	1.3%	1.7%	1.5%	1.4%	1.3%
Wind	27.0%	32.4%	42.6%	33.7%	22.7%	34.6%	42.6%	39.7%	29.1%
<b>TOTAL GENERATION BY FUEL (TWh)</b>									
Biomass					15.6	16.8	18.0	21.4	21.3
Hydro					101.7	130.8	113.1	126.9	109.2
Solar					30.3	36.1	40.2	43.8	40.5
Waste					2.3	2.6	3.5	3.2	3.2
Wind					55.5	53.6	64.6	57.4	71.6
<b>TOTAL</b>					<b>205.4</b>	<b>240.0</b>	<b>239.4</b>	<b>252.8</b>	<b>245.8</b>
Primary Renewable Source					HYDRO	HYDRO	HYDRO	HYDRO	HYDRO
<b>CHANGE SINCE Q1 2015 (%)</b>									
Biomass						8%	16%	38%	37%
Hydro						29%	11%	25%	7%
Solar						19%	33%	45%	34%
Waste						14%	50%	40%	39%
Wind						-3%	16%	3%	29%



## Notes on the Report

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The figures used in the report refer to data provided through Entsoe which have been aggregated into a European total. This data does sometimes suffer from outages in reporting, but is generally complete.

EnAppSys provides services to companies in the energy and power markets, specifically by providing data, information and consultancy services.

EnAppSys is focused on providing information and analytical services covering the energy sector and is actively growing the business to provide products with enhanced analysis and forecasting capabilities.

The company has a European platform which covers underlying activity across all European markets with more detailed information available across Ireland, Belgium and the Netherlands with additional content in other regions being continuously built out.

To find out more about EnAppSys contact the company at [about@enappsys.com](mailto:about@enappsys.com) or visit the company's website at [www.enappsys.com](http://www.enappsys.com).