

RENEWABLE ENERGIES

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 SELLA
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RENEWABLE ENERGY OBSERVATORY
FOR THE DIGITAL ECONOMY

PREPARED BY:

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Source: own elaboration based on data from Redeia.



2023 OVERVIEW

Renewable energies marked a **new historic year** in 2023, both in installed capacity and in generation within the national electricity system. This allows for further progress towards the objectives of energy transition and decarbonization of the economy.

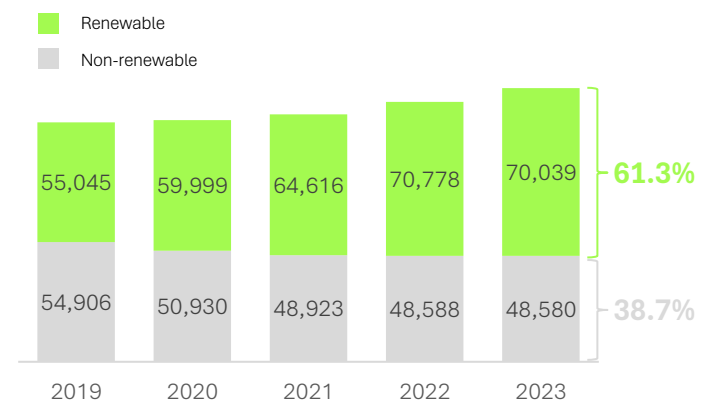
Regarding installed capacity, the generation capacity of the system increased by 6,253 MW, 5.2% more than the previous year, reaching 125,620 MW. The implementation of renewables was slightly higher, with 6,261 MW (the highest increase in the last four years), compared to a decrease of 8 MW in non-renewable power. Nearly **nine out of ten new megawatts of capacity corresponded to photovoltaic solar, which recorded its highest growth** in the series by adding 5,594 MW in a single year. The rest of the renewable increase was almost exclusively concentrated in wind power, with an additional 661 MW (2.2%).

By the end of the year, **renewable sources** accounted for 77,039 MW of installed capacity, **representing 61.3% of the total national electricity system**, advancing more than eleven points in just four years. **Solar energy** (photovoltaic and thermal) now ranks as the second largest source with the highest capacity (27,853 MW), only behind **wind** (30,810 MW), **together accounting for almost half of the national generation park** (46.7%).

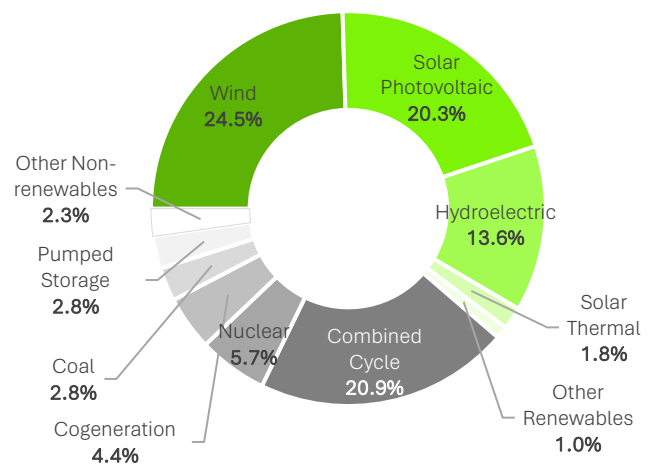
Installed capacity 2023

	MW	Year-to-year Variation
Renewable	77,039	6,261 (+8.8%)
Wind	30,810	661 (+2.2%)
Solar Photovoltaic	25,549	5,594 (+28%)
Hydroelectric	17,097	2 (+0.01%)
Solar Thermal	2,304	0
Other Renewables	1,097	4 (+0.3%)
Renewable Waste	170	0
Hydro-Wind	11	0
Non-renewable	48,580	-8 (-0.02%)
Combined Cycle	26,250	0
Nuclear	7,117	0
Cogeneration	5,583	-8 (-0.1%)
Coal	3,464	0
Pumped Storage	3,331	0
Gas Turbine	1,149	0
Diesel Engines	769	0
Steam Turbine	483	0
Non-renewable Waste	426	0
Fuel + gas	8	0
Total general	125,620	6,253 (+5.2%)

Evolution of installed capacity



Composition of installed capacity



In the case of photovoltaics, Castile-La Mancha, Andalusia, and Extremadura accounted for three-quarters of the new installed capacity, while in three regions (Asturias, Cantabria, and Madrid) there was no new capacity installed, and in five others, the installed capacity was negligible. Extremadura and Castile-La Mancha remain leaders in photovoltaic capacity, with 49.1% of the national total.

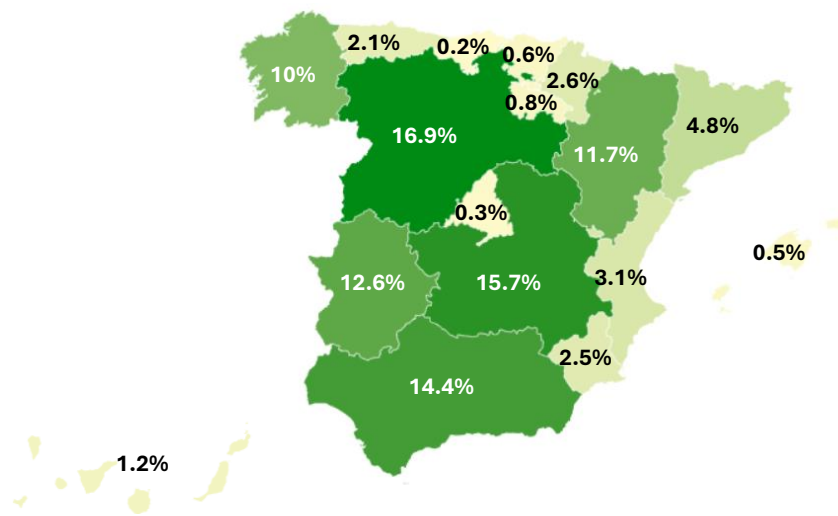
On the other hand, Aragon and Navarre led the deployment of wind energy, with nearly two-thirds of the new capacity. In contrast, there were no new installations in eight regions, among which Madrid was the only one without wind power. Castile and Leon, Aragon, and Castile-La Mancha account for more than half of the country's total wind capacity (54.4%).

In the last four years, the deployment of renewable energies in the national electricity system has grown by 21,995 MW, 40% more, mainly thanks to photovoltaic solar, which almost tripled its capacity, with 16,803 MW more (192.1%). Wind power recorded an increase of 5,125 MW, 20% more. The deployment of renewables in this period has more than compensated for the decline in the power of non-renewable sources, which has been 6,326 MW less (-11.5%), mainly due to the closure of coal plants (6,219 MW less).

New renewable capacity 2023 by Autonomous Communities

	MW	Year-to-year Variation		MW	Year-to-year Variation
Solar Photovoltaic	5,594	+28.0%	Wind	661	+2.2%
Castile-La Mancha	2,024	+49.2%	Aragon	211	+4.2%
Andalusia	1,170	+27.8%	Navarre	202	+14.9%
Extremadura	1,064	+19.9%	Castile-La Mancha	97	+2.0%
Aragon	551	+29.7%	Extremadura	50	+125.7%
Castile and Leon	454	+31.2%	Remainder	102	+0.5%
Murcia	162	+11.5%			
Balearic Islands	104	+45.3%			
Remainder	65	+4.8%			

Distribution of renewable capacity by Autonomous Communities



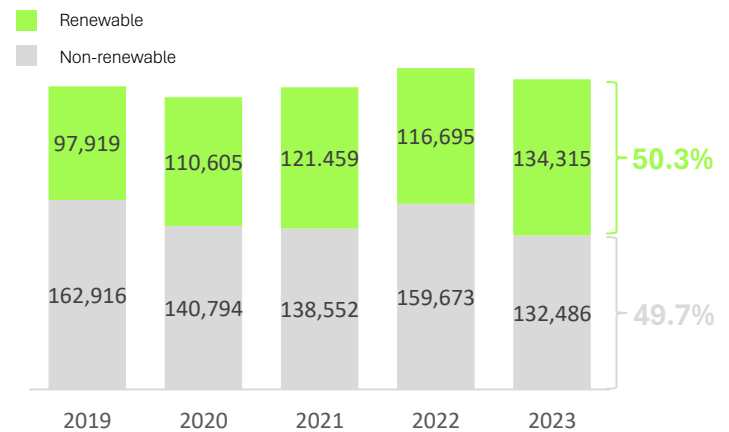
From the perspective of electricity generation, 2023 was also a **record year for renewable energies: 134,315 GWh were injected into the system, 15.1% more than the previous year and 37.2% more than in 2019.** The sources that most drove this growth were **solar photovoltaic, whose deployment allowed it to advance by 33.8% and set a new record (37,328 GWh), and hydroelectric, which rose by 41.1% thanks to the recovery of rainfall in various areas of the peninsula.** Solar thermal also added 13.9%. **Wind recorded an increase of only 2.2%, but it was enough to break its record (62,569 GWh) and regain the top spot among generation sources.** The rest of the renewables ended with volumes lower than the previous year.

Despite this progress, **the total generation of the national electricity system decreased by 3.5% compared to 2022 due to a 17% drop in non-renewable sources, explained by the collapse of combined cycle production (-32.4%) and the lower contribution of nuclear (-3%) and cogeneration (-2.6%).** This different evolution meant **that renewables represented more than half of the national generation mix for the first time: they rose to 50.3%, eight points more than the previous year.**

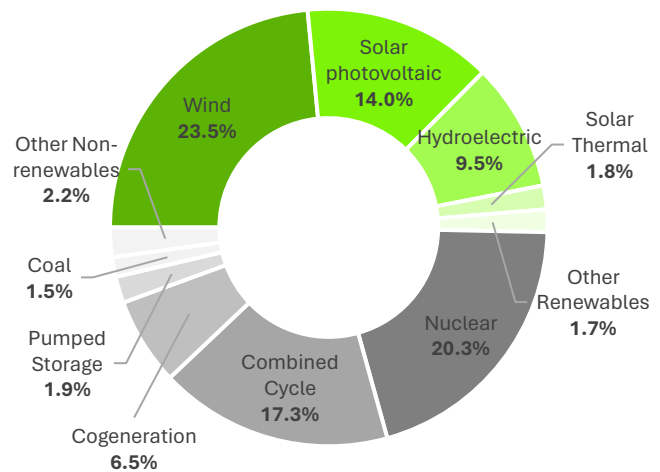
Electricity generation 2023

	GWh	Year-to-year Variation
Renewable	134,315	15.1%
Wind	62,569	2.2%
Solar Photovoltaic	37,328	33.8%
Hydroelectric	25,271	41.1%
Solar Thermal	4,694	13.9%
Other Renewables	3,590	-23.0%
Renewable Waste	846	-3.6%
Hydro-Wind	17	-23.6%
Non-renewable	132,486	-17.0%
Nuclear	54,276	-3.0%
Combined Cycle	46,051	-32.4%
Cogeneration	17,291	-2.6%
Pumped Storage	5,195	37.6%
Coal	3,871	-50.1%
Diesel Engines	2,511	-1.4%
Non-renewable Waste	1,319	-30.6%
Steam Turbine	1,218	0.9%
Gas Turbine	754	14.7%
Total general	266,801	-3.5%

Evolution of electricity generation



Composition of electricity generation



By regions, the largest increases in renewable generation in 2023 were located in Extremadura (31.9%), Balearic Islands (28%), Galicia (23.9%), Asturias (20.5%), Castile-La Mancha (20.3%), and Aragon (18.9%). In volume, **82% of all green energy generated in the country is concentrated in six regions:** Castile and Leon, Castile-La Mancha, Andalusia, Aragon, Galicia, and Extremadura. Additionally, three of them stand out for having more than 75% of renewable generation over the total.

In comparison with 2019, the largest increases in renewable production have occurred in Extremadura (187.7%), Aragon (119.4%), Balearic Islands (89.7%), Castile-La Mancha (56.9%), and Murcia (51%). In contrast, **six regions that last year recorded lower levels of renewable generation than four years ago:** La Rioja (-21.5%), Basque Country (-21.1%), Catalonia (17.2%), Cantabria (-10.7%), Asturias (-6.7%), and the Valencian Community (-6.2%).

The decrease in generation is related to **lower national demand**, which decreased by 2.3% to 244,659 GWh. It decreases for the second consecutive year and is **at the lowest level since 2004**. In the last two years, there has been a clear divergence between the growing economic activity and the lower electrical demand on the grid, justified mainly by the strong push of self-consumption, both in productive sectors and households. At the current level, **national renewable generation covers 54.9% of the demand for the electricity system**.

Ranking of renewable generation

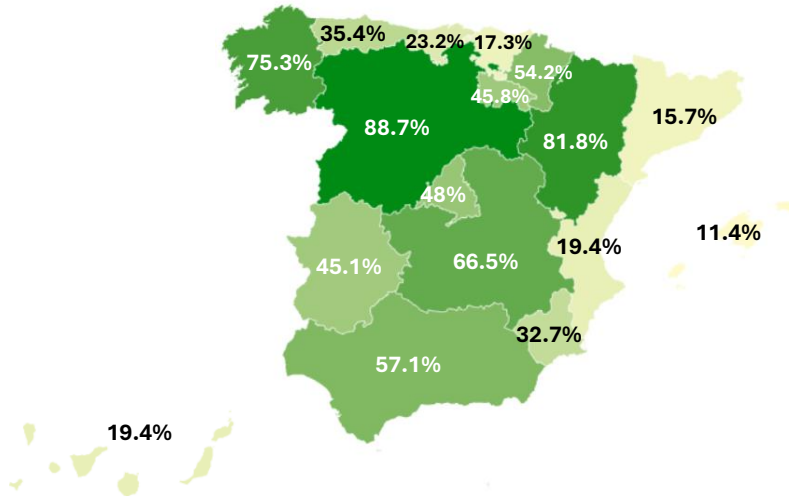
	GWh	% total national
Total Renewables	134,315	
Castile and Leon	23,271	17.3%
Castile-La Mancha	19,006	14.2%
Andalusia	18,229	13.6%
Aragon	18,194	13.5%
Galicia	17,987	13.4%
Extremadura	13,402	10.0%
Catalonia	6,012	4.5%
Navarre	3,865	2.9%
Valencian Community	3,451	2.6%
Asturias	3,132	2.3%
Murcia	2,840	2.1%
Canary Islands	1,697	1.3%
La Rioja	1,000	0.7%
Basque Country	881	0.7%
Balearic Islands	519	0.4%
Madrid	450	0.3%
Cantabria	371	0.3%

Leading Communities in solar and wind

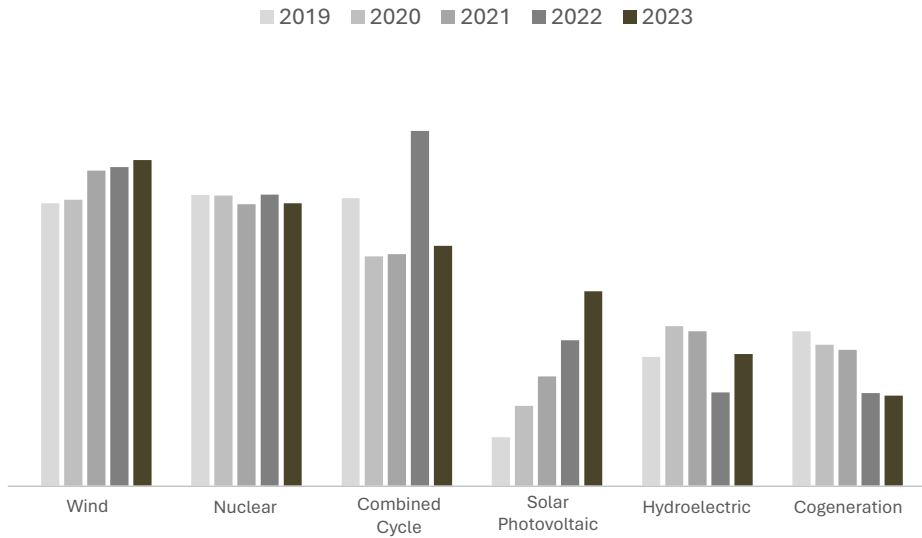
	GWh	% total national
Solar Photovoltaic	37,328	
Extremadura	9,167	24.6%
Castile-La Mancha	8,511	22.8%
Andalusia	8,470	22.7%
Aragon	3,862	10.3%
	GWh	% total national
Wind	62,569	
Castile and Leon	13,553	21.7%
Aragon	12,004	19.2%
Galicia	9,086	14.5%
Castile-La Mancha	9,018	14.4%
Andalusia	6,282	10%



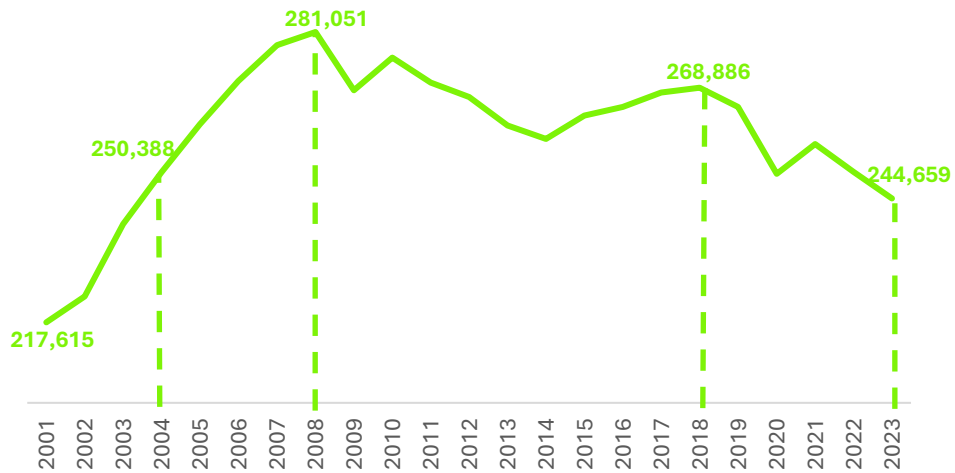
Renewable generation over the total of each Community



Evolution of the main sources of electricity generation



Evolution of national electricity demand





Installed capacity 2023

	MW	Year-to-year Variation
Renewable	11,100	12.1%
Solar Photovoltaic	5,383	27.8%
Wind	3,642	0.8%
Solar Thermal	1,000	0.0%
Hydroelectric	623	0.0%
Other Renewables	451	0.0%
Non-renewable	7,812	0.0%
Combined Cycle	5,952	0.0%
Coal	570	0.0%
Cogeneration	654	0.0%
Pumped Storage	585	0.0%
Non-renewable Waste	51	0.0%
Total general	18,912	6.8%

Electricity generation 2023

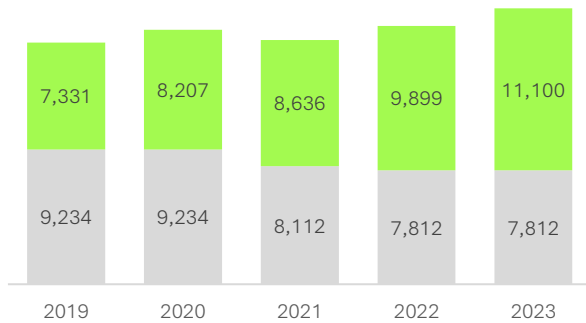
	GWh	Year-to-year Variation
Renewable	18,229	9.1%
Solar Photovoltaic	8,470	44.4%
Wind	6,282	-10.0%
Solar Thermal	2,098	13.3%
Other Renewables	1,204	-29.6%
Hydroelectric	175	-40.8%
Non-renewable	13,686	-30.4%
Combined Cycle	9,670	-34.4%
Cogeneration	3,367	14.9%
Pumped Storage	387	55.5%
Coal	240	-86.1%
Non-renewable Waste	21	-8.6%
Total general	31,915	-12.3%

Andalusia closed 2023 with an increase of 1,200 MW of renewable installed capacity (+12.1%), again thanks to the strong boost of solar photovoltaic (1,170 MW). With this, renewables already reach 58.7% of the Andalusian generating capacity.

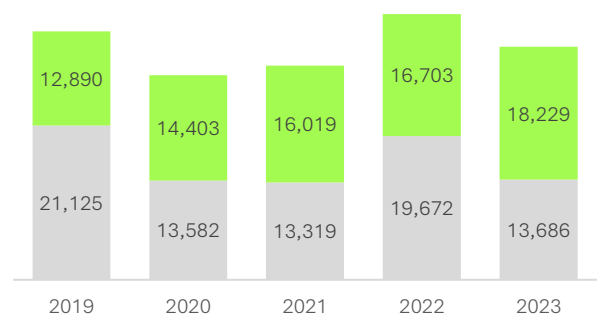
Renewable generation grew by 9.1%, mainly due to photovoltaics (44.4%), which became the second-largest generation source in the region. In contrast, wind had a negative year (-10%) and hydroelectric (-40.8%) fell to its lowest level in decades. Meanwhile, non-renewables recorded a collapse of 30.4%, so total generation fell by 12.3%, much more than demand (38,099 GWh, -1.7%).

- Renewable
- Non-renewable

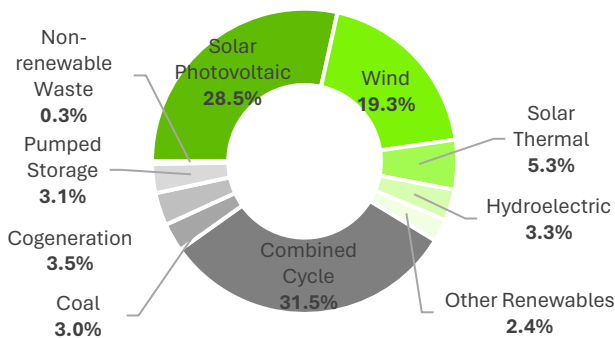
Installed capacity (MW)



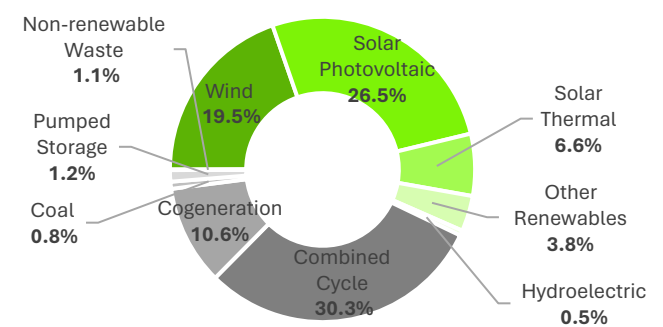
Electricity generation (GWh)



Composition of installed capacity



Composition of generation





Installed capacity 2023

	MW	Year-to-year Variation
Renewable	8,993	9.3%
Wind	5,246	4.2%
Solar Photovoltaic	2,405	29.7%
Hydroelectric	1,334	0.0%
Other Renewables	9	0.0%
Non-renewable	2,653	0.0%
Combined Cycle	1,870	0.0%
Cogeneration	514	0.0%
Pumped Storage	219	0.0%
Non-renewable Waste	50	0.0%
Total general	11,646	7.0%

Electricity generation 2023

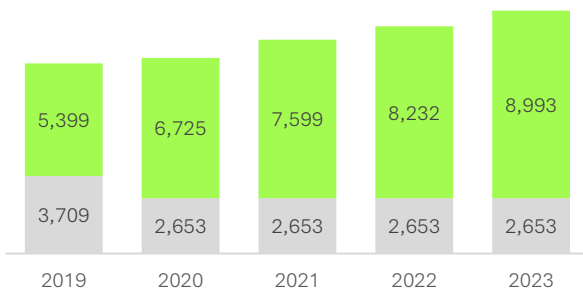
	GWh	Year-to-year Variation
Renewable	18,194	18.9%
Wind	12,004	17.7%
Solar Photovoltaic	3,862	35.1%
Hydroelectric	2,289	4.1%
Other Renewables	40	-17.6%
Non-renewable	4,041	-20.6%
Combined Cycle	2,011	-30.1%
Cogeneration	1,546	-10.8%
Pumped Storage	291	15.9%
Non-renewable Waste	192	-16.6%
Total general	22,235	9.0%

Aragon added 762 MW of renewable installed capacity in 2023, a 9.3% increase, reaching almost 9,000 MW in total. In the last year, the largest deployment was in solar photovoltaic, which is now the second-largest power source in the region and also the second in generation, surpassing combined cycles.

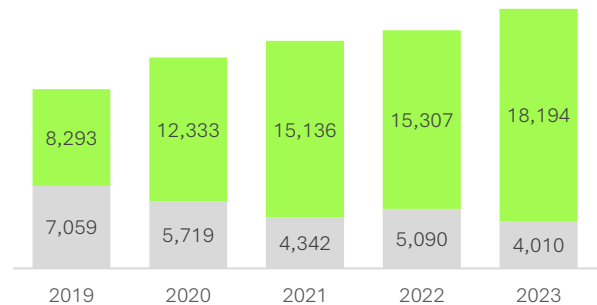
Renewable production reached a record of 18,194 GWh, a 18.9% increase, due to the increase in wind (+17.7%) and photovoltaic (35.1%) and a slight recovery in hydroelectric (4.1%). This growth offset the 20.6% decrease in non-renewable generation, dragged down by combined cycles (-30.1%) and cogeneration (-10.8%), and ended with an overall increase of 9%, despite electricity demand (9,679 GWh) decreasing by 5.2%.

- Renewable
- Non-renewable

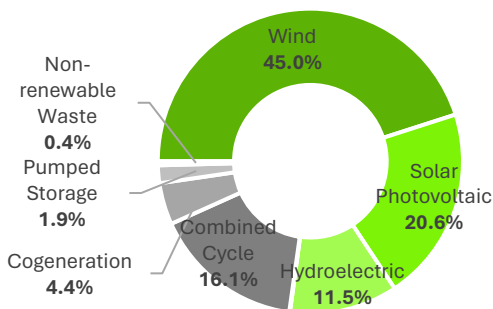
Installed capacity (MW)



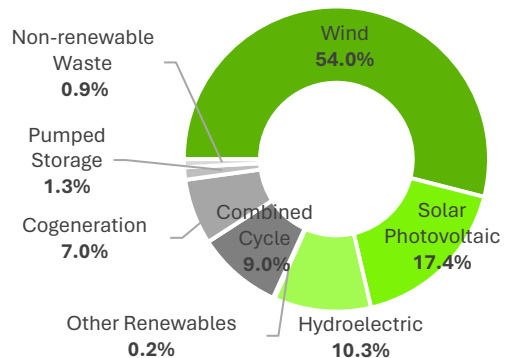
Electricity generation (GWh)



Composition of installed capacity



Composition of generation





Installed capacity 2023

	MW	Year-to-year Variation
Renewable	1,595	0.0%
Hydroelectric	805	0.0%
Wind	698	0.0%
Other Renewables	91	0.0%
Solar Photovoltaic	1	7.0%
Non-renewable	2,228	0.0%
Coal	1,250	0.0%
Combined Cycle	854	0.0%
Cogeneration	70	0.0%
Non-renewable Waste	54	0.0%
Total general	3,822	0.0%

Electricity generation 2023

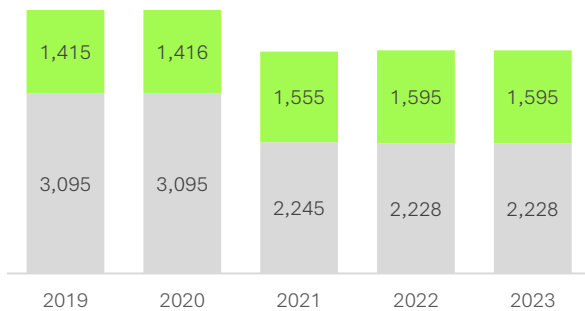
	GWh	Year-to-year Variation
Renewable	3,132	20.5%
Hydroelectric	1,472	59.3%
Wind	1,410	-0.8%
Other Renewables	250	-1.4%
Solar Photovoltaic	1	4.7%
Non-renewable	5,724	-41.6%
Coal	2,941	-42.4%
Combined Cycle	2,539	-34.4%
Cogeneration	115	-54.5%
Non-renewable Waste	67	-87.4%
Pumped Storage	61	59.5%
Total general	8,856	-28.6%

Asturias experienced a weak year for renewables in 2023. Regarding installed capacity, there were no significant changes (less than one megawatt of photovoltaic was installed), so non-renewable sources remain the majority (58.3% of the total).

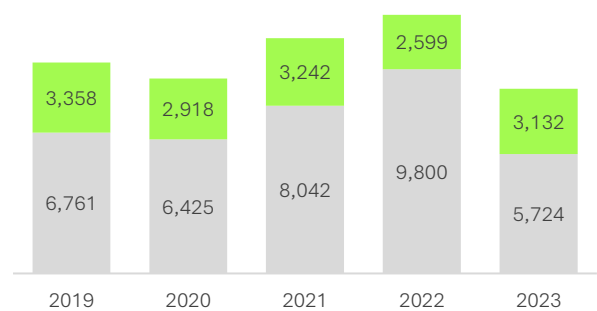
On the generation side, although there was a 20.5% increase in renewable sources, this was almost exclusively concentrated in hydroelectric power. Meanwhile, non-renewables plummeted by 41.6%, dragged down by coal (-42.4%), combined cycles (-34.4%), and cogeneration (-54.5%). This explains the 28.6% decrease in the total power generation of the community, the second-largest decline in the country. It contrasts with the 6.2% decrease in internal demand (8,287 GWh), which is also the second-worst national figure.

- Renewable
- Non-renewable

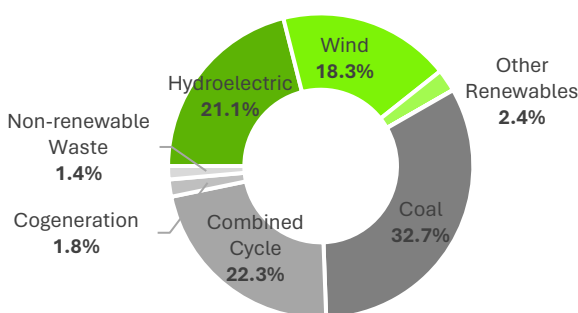
Installed capacity (MW)



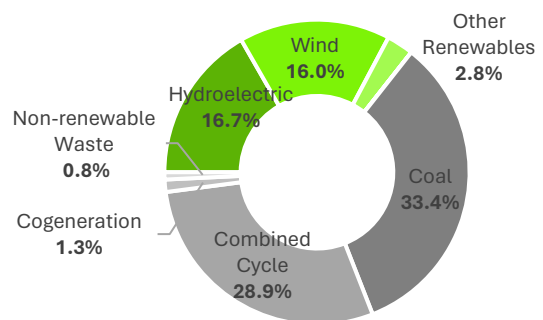
Electricity generation (GWh)



Composition of installed capacity



Composition of generation





Balearic Islands

Installed capacity 2023

	MW	Year-to-year Variation
Renewable	376	38.1%
Solar Photovoltaic	333	45.3%
Renewable Waste	37	0.0%
Wind	4	-1.1%
Other Renewables	2	0.0%
Non-renewable	1,856	0.0%
Combined Cycle	823	0.0%
Gas Turbine	603	0.0%
Coal	241	0.0%
Diesel Engines	139	0.0%
Non-renewable Waste	37	0.0%
Cogeneration	12	0.0%
Total general	2,232	4.9%

Electricity generation 2023

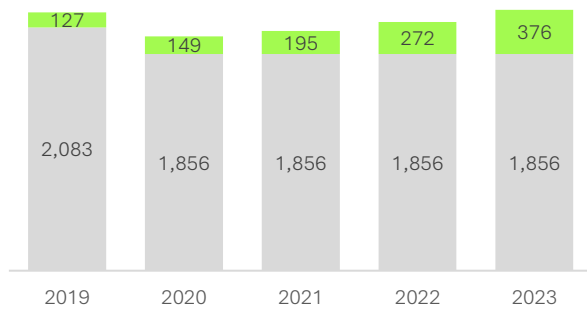
	GWh	Year-to-year Variation
Renewable	519	28.0%
Solar Photovoltaic	384	42.5%
Renewable Waste	133	0.1%
Wind	1	-12.5%
Other Renewables	1	-49.3%
Non-renewable	4,054	-19.5%
Combined Cycle	3,071	-22.9%
Gas Turbine	498	25.8%
Diesel Engines	251	-39.4%
Non-renewable Waste	133	0.1%
Coal	60	-23.1%
Cogeneration	40	50.5%
Total general	4,573	-15.9%

In 2023, the deployment of solar photovoltaic power in the Balearic Islands accelerated, with 104 MW more, allowing it to surpass coal and bringing the total growth of renewables to 38.1%. However, the weight of these energies in the islands' generating capacity is still very low (16.9%).

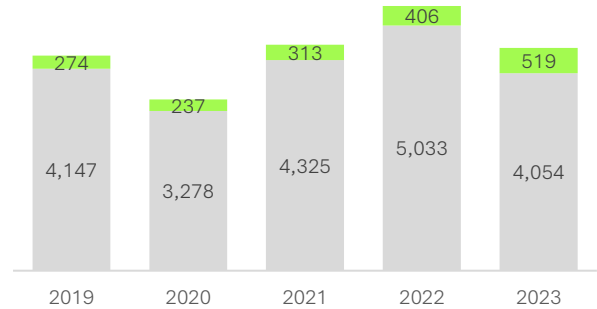
The increased presence of photovoltaics resulted in a 28% increase in renewable generation, increasing their share in the regional mix to 11.4% of the total, also benefiting from a 19.5% reduction in non-renewables. Overall, the Balearic electrical system produced 15.9% less energy than the previous year, although demand (5,999 GWh) barely decreased by 0.7%. The generator deficit was again covered through the link to the peninsular grid.

- Renewable
- Non-renewable

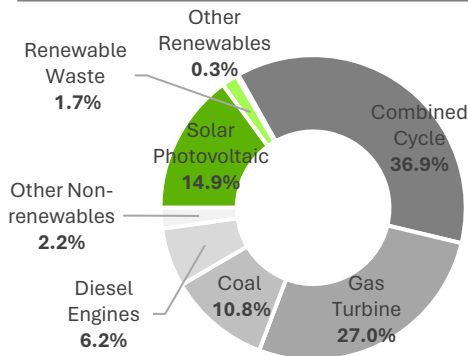
Installed capacity (MW)



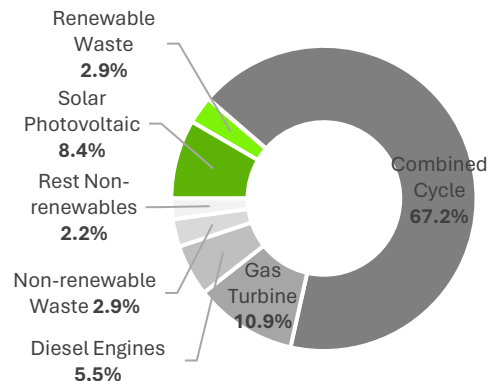
Electricity generation (GWh)



Composition of installed capacity



Composition of generation





Canary Islands

Installed capacity 2023

	MW	Year-to-year Variation
Renewable	899	8.7%
Wind	645	7.7%
Solar Photovoltaic	234	10.5%
Hydro-Wind	11	0.0%
Other Renewables	7	101.2%
Hydroelectric	2	0.0%
Non-renewable	2,395	0.0%
Combined Cycle	865	0.0%
Gas Turbine	521	0.0%
Diesel Engines	488	0.0%
Steam Turbine	483	0.0%
Cogeneration	38	0.0%
Total general	3,294	0.0%

Electricity generation 2023

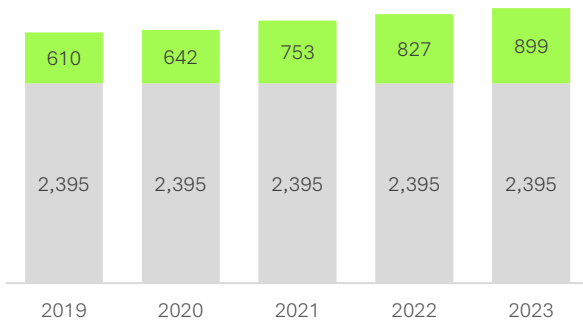
	GWh	Year-to-year Variation
Renewable	1,697	-1.5%
Wind	1,325	-3.5%
Solar Photovoltaic	344	9.5%
Hydro-Wind	17	-23.6%
Other Renewables	7	-21.9%
Hydroelectric	3	0.2%
Non-renewable	7,053	3.5%
Combined Cycle	3,697	3.0%
Diesel Engines	1,883	7.3%
Steam Turbine	1,218	0.9%
Gas Turbine	256	-1.9%
Cogeneration	0	-
Total general	8,750	2.5%

Canary Islands increased their renewable capacity by 72 MW in 2023 (+8.7%), of which two-thirds were wind (46) and the rest photovoltaic (22) and other renewables (4). With this, the community reaches 899 MW of renewable capacity, 27.3% of the total.

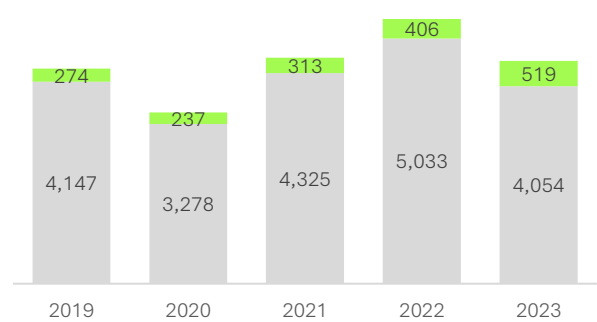
Despite the growth in installation, renewables had a year with lower production: it decreased by 1.5% compared to the previous year, as the increase in photovoltaics (9.5%) could not compensate for the decrease in wind and other renewables. Meanwhile, non-renewable generation increased by 3.5% due to the higher contribution of combined cycles and diesel engines. Overall, generation in the Canary Islands grew by 2.5%, in line with demand (8,750 GWh), which experienced the only increase among all communities.

- Renewable
- Non-renewable

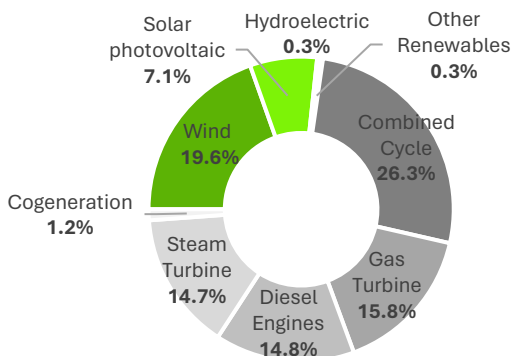
Installed capacity (MW)



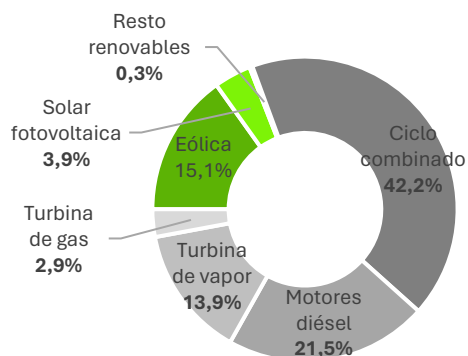
Electricity generation (GWh)



Composition of installed capacity



Composition of generation





Installed capacity 2023

	MW	Year-to-year Variation
Renewable	157	0.1%
Hydroelectric	99	0.0%
Wind	35	0.0%
Other Renewables	13	0.0%
Renewable Waste	5	0.0%
Solar Photovoltaic	5	4.1%
Non-renewable	646	0.0%
Pumped Storage	361	0.0%
Cogeneration	281	0.0%
Non-renewable Waste	5	0.0%
Total general	803	0.0%

Electricity generation 2023

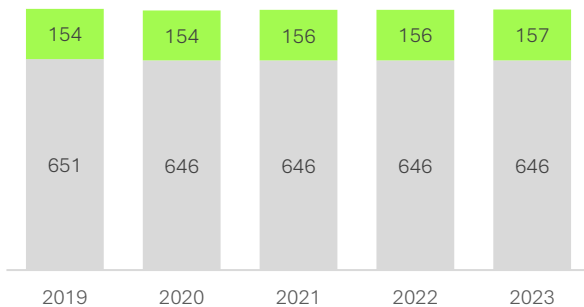
	GWh	Year-to-year Variation
Renewable	371	3.6%
Hydroelectric	178	3.7%
Other Renewables	78	20.2%
Wind	69	-12.2%
Renewable Waste	41	6.6%
Solar Photovoltaic	5	10.6%
Non-renewable	1,228	9.0%
Pumped Storage	631	25.2%
Cogeneration	557	-4.8%
Non-renewable Waste	41	6.6%
Total general	1,599	7.7%

The year ended in Cantabria practically without new installations of renewables in the grid. Only a testimonial increase of 4.1% in solar photovoltaic, although its presence barely reaches 5 MW. With its 157 MW, Cantabria is the second peninsular community with the lowest weight of renewables in its generating park.

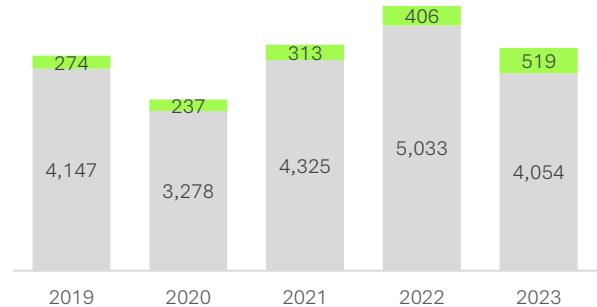
On the generation side, renewables recorded an increase of 3.6%, thanks to hydroelectric production (3.7%) and despite the lower contribution from Wind (-12.2%). Overall, renewables generated 23.2% of the total electricity in the community. They slightly reduce their weight compared to the previous two years due to the stronger increase in non-renewable generation (9%). In total, the region's production increased by 7.7%, contrasted with a decrease of 4.2% in regional demand (3,467 GWh).

- Renewable
- Non-renewable

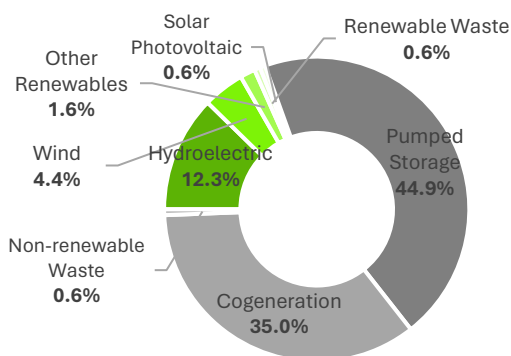
Installed capacity (MW)



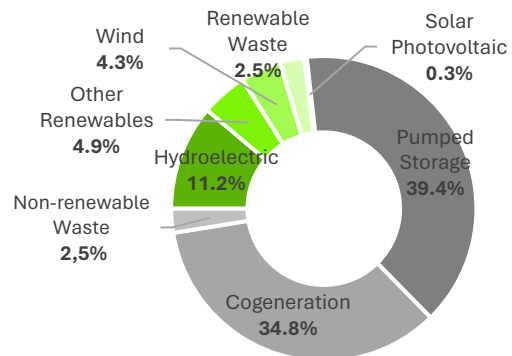
Electricity generation (GWh)



Composition of installed capacity



Composition of generation





Castile-La Mancha

Installed capacity 2023

	MW	Year-to-year Variation
Renewable	12,120	21.2%
Wind	4,876	2.0%
Solar Photovoltaic	6,134	49.2%
Hydroelectric	651	0.0%
Solar Thermal	349	0.0%
Other Renewables	110	0.0%
Non-renewable	2,347	0.0%
Nuclear	1,003	0.0%
Combined Cycle	759	0.0%
Cogeneration	370	0.0%
Pumped Storage	215	0.0%
Total general	14,467	17.2%

Electricity generation 2023

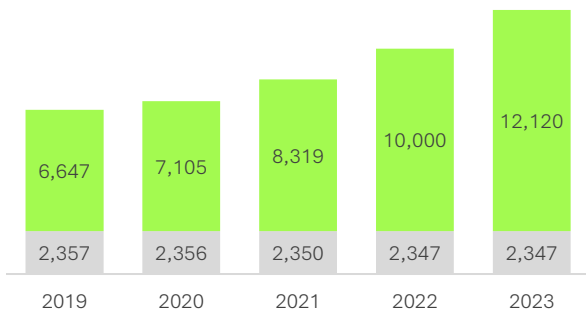
	GWh	Year-to-year Variation
Renewable	19,006	20.3%
Wind	9,018	9.1%
Solar Photovoltaic	8,511	42.3%
Hydroelectric	613	10.4%
Solar Thermal	583	18.2%
Other Renewables	282	-44.4%
Non-renewable	9,577	-1.6%
Nuclear	7,723	0.8%
Combined Cycle	1,180	-19.8%
Cogeneration	605	17.3%
Pumped Storage	70	-15.2%
Total general	28,584	11.9%

The year 2023 was historic for the deployment of renewables in Castile-La Mancha, with the addition of 2,121 MW, a 21.2% increase. Almost all of it corresponded to new photovoltaic capacity (2,024 MW, 49.2% more). In total, renewables now represent 83.8% of the total installed capacity in the region.

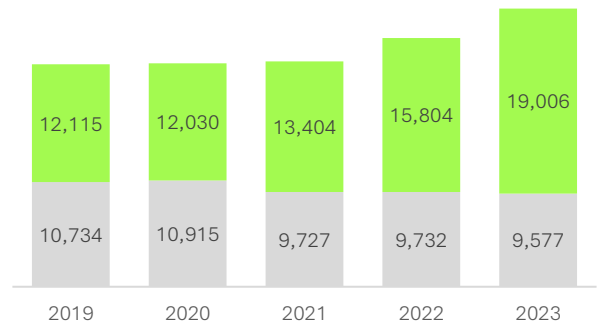
The new installations boosted renewable generation by 20.3% compared to the previous year. Photovoltaics, which grew by 42.3%, already produced more energy than nuclear and approached the Wind record. Together, renewables generated two-thirds of all the electricity in the community (66.5%). Meanwhile, non-renewables decreased by 1.6%.

- Renewable
- Non-renewable

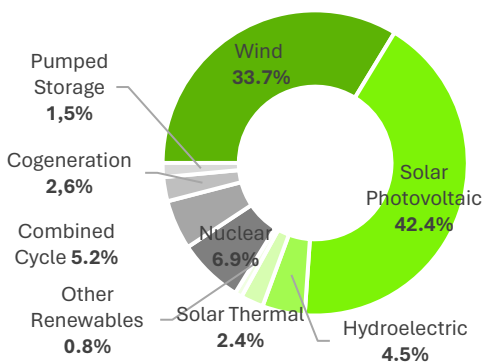
Installed capacity (MW)



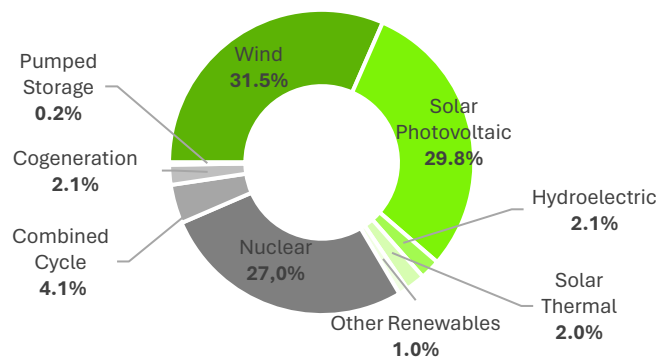
Electricity generation (GWh)



Composition of installed capacity



Composition of generation





Castile and Leon

Installed capacity 2023

	MW	Year-to-year Variation
Renewable	13,046	3.7%
Wind	6,640	0.1%
Hydroelectric	4,398	0.0%
Solar Photovoltaic	1,907	31.2%
Other Renewables	101	0.0%
Non-renewable	573	0.0%
Cogeneration	573	0.0%
Total general	13,619	3.5%

Electricity generation 2023

	GWh	Year-to-year Variation
Renewable	23,271	12.1%
Wind	13,553	-1.8%
Hydroelectric	6,574	48.3%
Solar Photovoltaic	2,589	30.4%
Other Renewables	555	0.6%
Non-renewable	2,968	24.3%
Cogeneration	1,936	2.6%
Pumped Storage	1,031	106.6%
Total general	26,238	13.3%

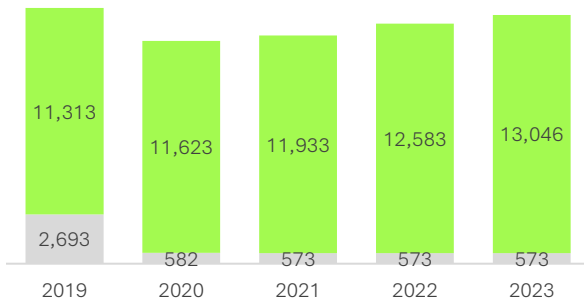
Castile and Leon remains the leading community in renewable energies, both in installed capacity and in generation. Regarding production capacity, renewables recorded a 3.7% increase in 2023 in the community, driven by a new boost in photovoltaics (454 MW more). With this, 95.8% of the total installed capacity corresponds to renewable sources.

In terms of generation, electricity from green sources increased by 12.1%. However, a record could not be reached as the decrease in wind (-1.8%) slowed down the strong increases in photovoltaics (30.4%) and hydroelectric (48.3%). Overall, renewables contributed 88.7% of the electricity produced in the region.

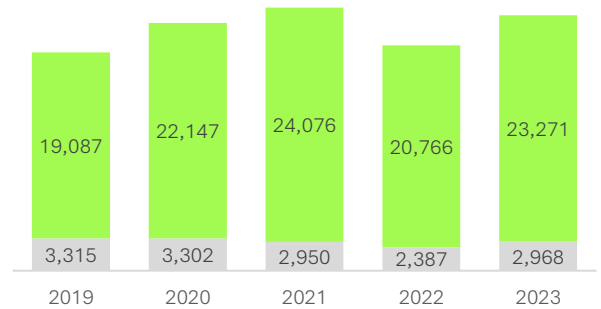
On the other hand, the demand for electricity in the community (12,998 GWh) decreased by 2.8%, half a percentage point more than the national average.

- Renewable
- Non-renewable

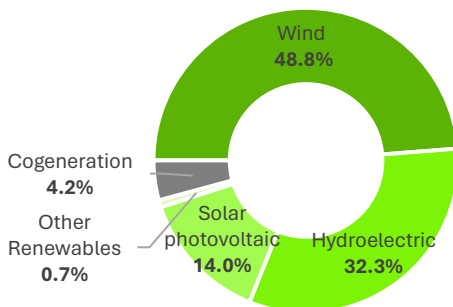
Installed capacity (MW)



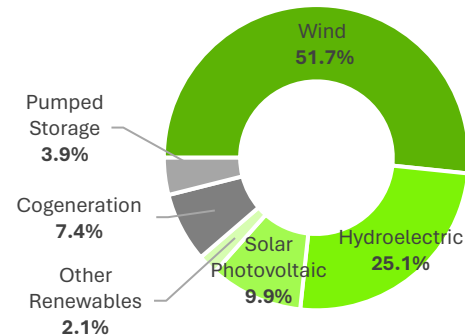
Electricity generation (GWh)



Composition of installed capacity



Composition of generation





Installed capacity 2023

	MW	Year-to-year Variation
Renewable	3,723	0.5%
Hydroelectric	1,922	0.0%
Wind	1,376	0.5%
Solar Photovoltaic	309	3.2%
Other Renewables	64	0.0%
Renewable Waste	27	0.0%
Solar Thermal	24	0.0%
Non-renewable	8,260	0.0%
Combined Cycle	3,788	0.0%
Nuclear	3,033	0.0%
Cogeneration	963	0.0%
Pumped Storage	440	0.0%
Non-renewable Waste	37	0.0%
Total general	11,983	0.1%

Electricity generation 2023

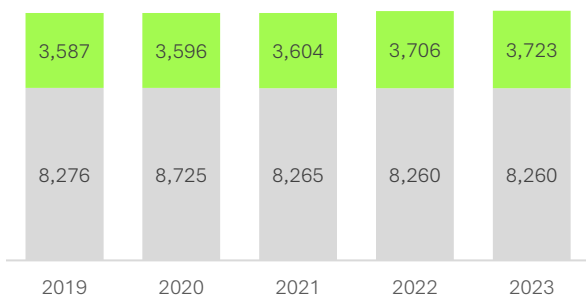
	GWh	Year-to-year Variation
Renewable	6,012	2.2%
Wind	3,075	25.3%
Hydroelectric	2,203	-17.7%
Solar Photovoltaic	394	2.3%
Renewable Waste	140	1.7%
Other Renewables	134	-17.4%
Solar Thermal	66	-2.5%
Non-renewable	32,255	-9.7%
Nuclear	22,368	-6.7%
Combined Cycle	5,826	-26.5%
Cogeneration	3,602	5.7%
Pumped Storage	311	15.5%
Non-renewable Waste	148	2.4%
Total general	38,267	-8.1%

The installation of renewables continues to stagnate in Catalonia. In 2023, only 17 MW of this energy were installed (9 in photovoltaics and 8 in wind), barely 0.5% more, so their share in the community's energy mix is 31.1%. Hydroelectric power remains the renewable source with the most installed capacity.

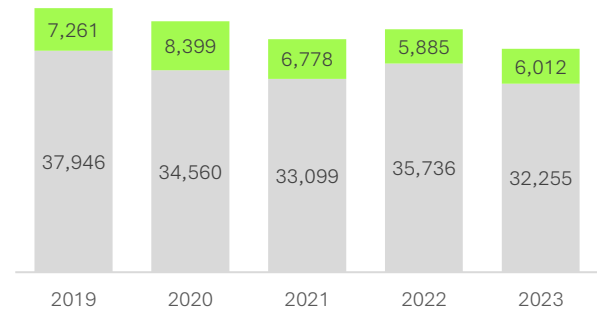
In terms of generation, renewables advanced by 2.2%, but the wind record (25.3% more) was minimized by the drop in hydroelectric power (-17.7%), which due to drought reached its lowest level in at least the last three decades. The renewable contribution remains at 15.7%, the lowest figure in the peninsular system. Demand (44,209 GWh) decreased by 1.5%.

- Renewable
- Non-renewable

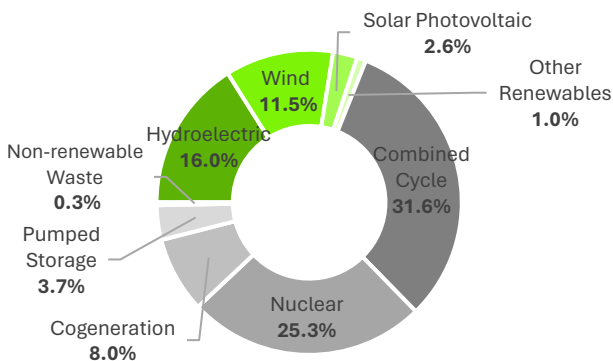
Installed capacity (MW)



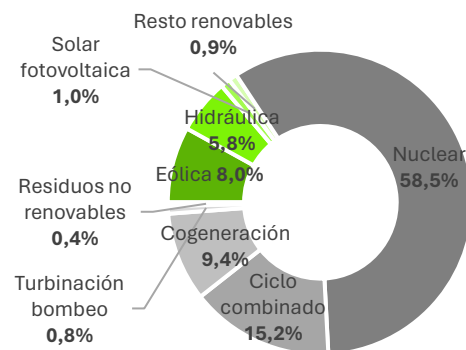
Electricity generation (GWh)



Composition of installed capacity



Composition of generation





Valencian Community

Installed capacity 2023

	MW	Year-to-year Variation
Renewable	2,400	1.1%
Wind	1,243	0.0%
Hydroelectric	642	0.0%
Solar Photovoltaic	453	6.0%
Solar Thermal	50	0.0%
Other Renewables	13	0.0%
Non-renewable	5,939	-0.1%
Combined Cycle	2,854	0.0%
Pumped Storage	1,512	0.0%
Nuclear	1,064	0.0%
Cogeneration	439	-1.7%
Non-renewable Waste	63	0.0%
Fuel + Gas	8	0.0%
Total general	8,339	0.2%

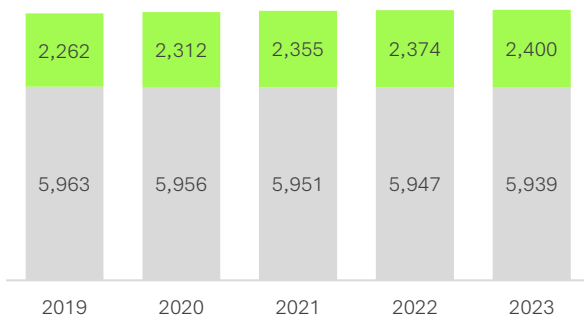
Electricity generation 2023

	GWh	Year-to-year Variation
Renewable	3,451	13.7%
Wind	2,272	13.9%
Solar Photovoltaic	642	13.3%
Hydroelectric	413	16.7%
Solar Thermal	95	7.3%
Other Renewables	29	-10.5%
Non-renewable	14,305	-9.9%
Nuclear	7,941	-4.2%
Combined Cycle	3,188	-31.9%
Pumped Storage	2,182	25.4%
Cogeneration	970	-13.4%
Non-renewable Waste	24	-41.2%
Fuel + Gas	0	-
Total general	17,756	-6.1%

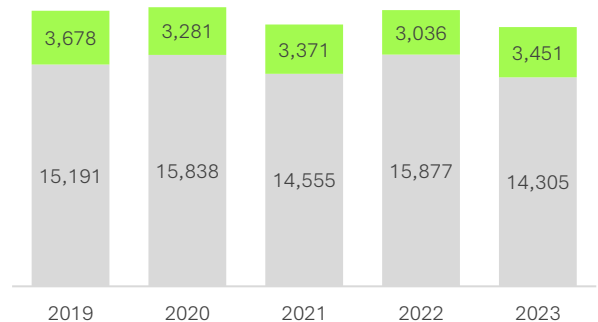
In 2023, the Valencian Community recorded a small increase in renewable installed capacity: 23 MW more, barely 1.1%, all of them from photovoltaics. In contrast, there was a slight decrease in non-renewable capacity due to a reduction in cogeneration (8 MW less). Overall, green sources account for 28.8% of the regional generation park. Despite the limited increase in power, renewables managed to increase their production by 13.7%, contrasting with a 9.9% decrease in other energy sources. This different evolution has allowed green energy to increase its share to 19.4% of the total, almost reaching the same level as in 2019. Demand (26,367 GWh) decreased by 2.5%, slightly more than the national total (-2.3%).

- Renewable
- Non-renewable

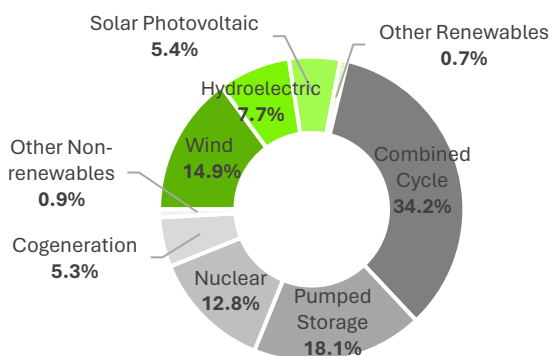
Installed capacity (MW)



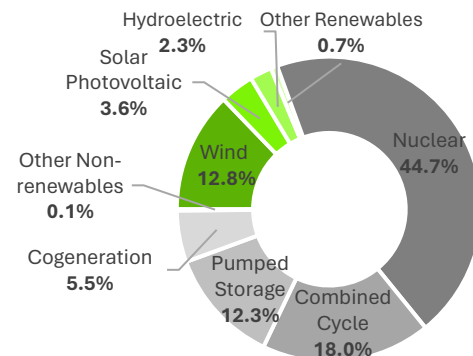
Electricity generation (GWh)



Composition of installed capacity



Composition of generation





Installed capacity 2023

	MW	Year-to-year Variation
Renewable	9,669	13.0%
Solar Photovoltaic	6,410	19.9%
Hydroelectric	2,277	0.0%
Solar Thermal	849	0.0%
Wind	89	125.7%
Other Renewables	44	0.0%
Non-renewable	2,027	0.0%
Nuclear	2,017	0.0%
Cogeneration	10	0.0%
Total general	11,696	10.5%

Electricity generation 2023

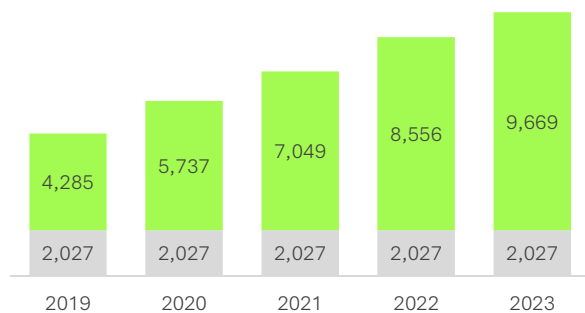
	GWh	Year-to-year Variation
Renewable	13,402	31.9%
Solar Photovoltaic	9,167	31.8%
Hydroelectric	2,100	69.1%
Solar Thermal	1,816	14.5%
Other Renewables	212	-18.1%
Wind	106	-13.5%
Non-renewable	16,320	1.6%
Nuclear	16,245	1.6%
Cogeneration	41	-0.5%
Pumped Storage	33	25.3%
Total general	29,721	13.3%

In 2023, Extremadura increased its installed capacity of renewables by 1,114 MW, reaching a total of 9,669 MW, which accounts for 82.7% of the total power connected to the grid in the community. Almost all of this new generation capacity was once again located in solar photovoltaics, which now represents 54.8% of the region's total and is already more than triple that of nuclear power. Wind power took another step with the commissioning of a second park.

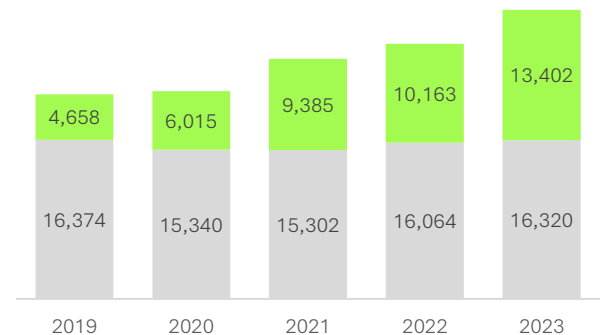
The growth in capacity drove generation to reach a record of 29,721 GWh, of which 13,402 (45.1%) are of renewable origin. Extremadura remains a leader in photovoltaic production (24.6% of the national total), which accounted for almost a third of the electricity generated in the region (30.8%). Hydroelectric power returned to second place due to the recovery of rainfall. Overall, renewables met 281.5% of the region's electricity demand (4,761 GWh), which decreased by 1.8%.

- Renewable
- Non-renewable

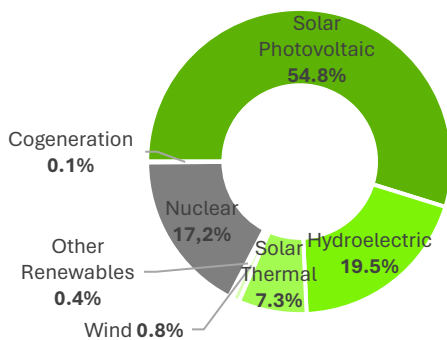
Installed capacity (MW)



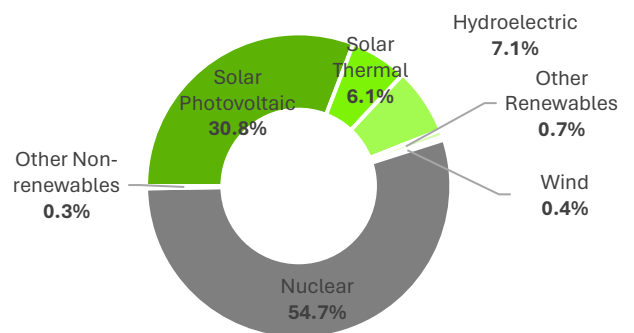
Electricity generation (GWh)



Composition of installed capacity



Composition of generation





Installed capacity 2023

	MW	Year-to-year Variation
Renewable	7,729	0.0%
Wind	3,887	0.0%
Hydroelectric	3,732	0.1%
Other Renewables	65	0.0%
Renewable Waste	25	0.0%
Solar Photovoltaic	19	4.1%
Non-renewable	3,222	0.0%
Coal	1,403	0.0%
Combined Cycle	1,247	0.0%
Cogeneration	531	0.0%
Non-renewable Waste	41	0.0%
Total general	10,951	0.0%

Electricity generation 2023

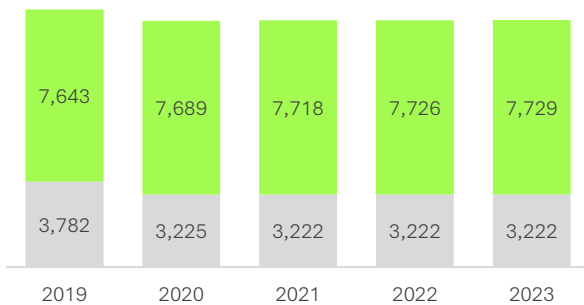
	GWh	Year-to-year Variation
Renewable	17,987	23.9%
Wind	9,086	-6.5%
Hydroelectric	8,364	102.3%
Other Renewables	355	-26.5%
Renewable Waste	160	-2.2%
Solar Photovoltaic	23	1.2%
Non-renewable	5,885	-25.4%
Combined Cycle	3,759	-25.7%
Cogeneration	1,138	-32.6%
Coal	629	-26.8%
Pumped Storage	198	69.4%
Non-renewable Waste	160	-2.2%
Total general	23,872	6.5%

In 2023, Galicia did not see any significant advancement in the implementation of renewable energies: there were only 3 MW more, two of them in hydroelectric and one in combined cycle. Therefore, renewables remain at 70.6% of the total generating capacity of the community, which has barely changed in the last four years.

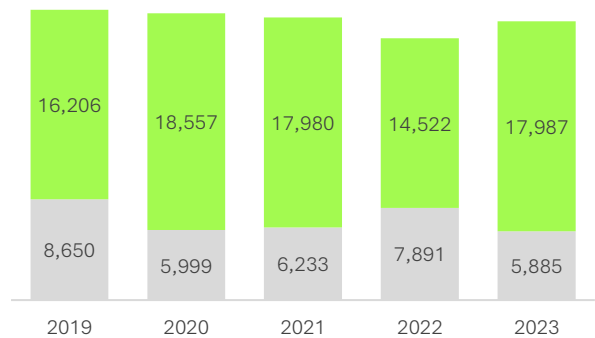
However, there was a strong increase in renewable generation, which grew by 23.9%. Nevertheless, this was due to the recovery of hydroelectric power (102.3%), which offset the declines in other sources. In any case, three-quarters of the energy generated in the community came from renewable sources (75.3%). The total only increased by 6.5% due to the decrease in non-renewable production (-25.4%). Demand decreased by 5.8%, the third worst figure in the country.

- Renewable
- Non-renewable

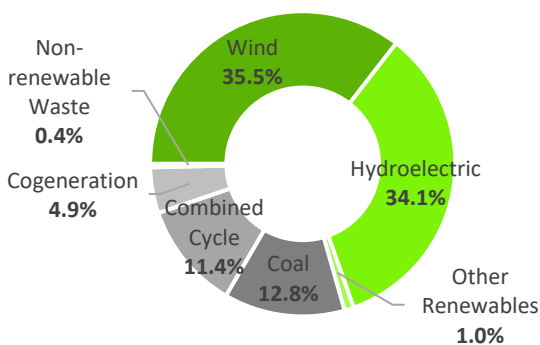
Installed capacity (MW)



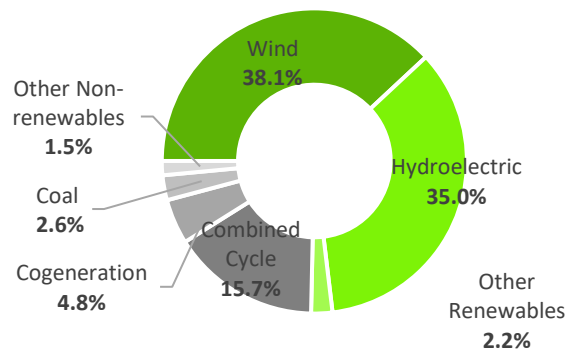
Electricity generation (GWh)



Composition of installed capacity



Composition of generation





Installed capacity 2023

	MW	Year-to-year Variation
Renewable	232	0.0%
Hydroelectric	109	0.0%
Solar Photovoltaic	64	0.0%
Other Renewables	45	0.0%
Renewable Waste	15	0.0%
Non-renewable	225	0.0%
Cogeneration	210	0.0%
Non-renewable Waste	15	0.0%
Total general	457	0.0%

Electricity generation 2023

	GWh	Year-to-year Variation
Renewable	450	13.4%
Other Renewables	147	-8.8%
Solar Photovoltaic	145	80.6%
Hydroelectric	91	7.5%
Renewable Waste	68	-4.8%
Non-renewable	489	-9.7%
Cogeneration	421	-10.5%
Non-renewable Waste	68	-4.8%
Total general	939	0.1%

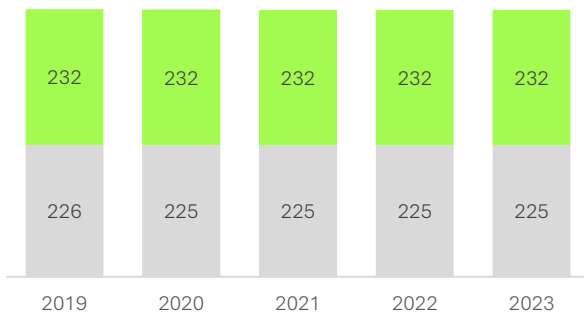
Another year without changes in the installed capacity in the Community of Madrid, which has remained unchanged since 2016. The region has the lowest generation capacity in the country (457 MW) and the second lowest volume of renewable power (232 MW), only behind Cantabria.

Although there were no new installations, solar photovoltaic managed to increase its generation by 80.6%. Coupled with the slight recovery of hydroelectric power, the overall renewable energy experienced a 13.4% increase. Meanwhile, non-renewable sources reduced their production by 9.7%, allowing green energies to represent 48% of the total in the region.

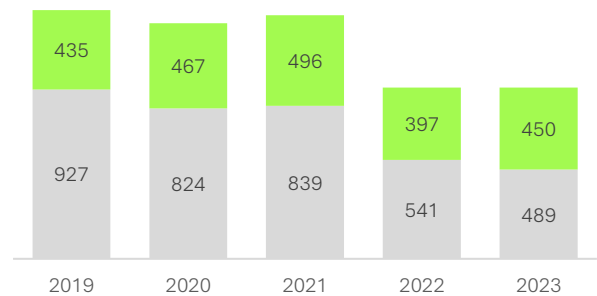
The electrical demand of the community (27,113 GWh) decreased by 1.5%, eight-tenths less than the total for the country.

- Renewable
- Non-renewable

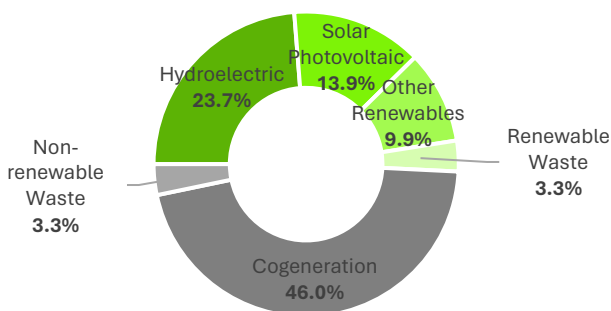
Installed capacity (MW)



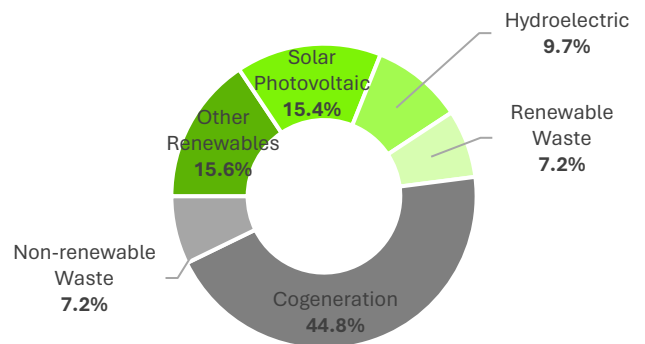
Electricity generation (GWh)



Composition of installed capacity



Composition of generation





Installed capacity 2023

	MW	Year-to-year Variation
Renewable	1,906	9.3%
Solar Photovoltaic	1,568	11.5%
Wind	263	0.0%
Hydroelectric	35	0.0%
Solar Thermal	31	0.0%
Other Renewables	8	0.0%
Non-renewable	3,563	0.0%
Combined Cycle	3,264	0.0%
Cogeneration	299	0.0%
Total general	5,469	3.1%

Electricity generation 2023

	GWh	Year-to-year Variation
Renewable	2,840	6.1%
Solar Photovoltaic	2,292	8.6%
Wind	403	-1.9%
Hydroelectric	81	0.5%
Other Renewables	28	-30.3%
Solar Thermal	37	2.4%
Non-renewable	5,855	-34.7%
Combined Cycle	4,799	-38.4%
Cogeneration	1,056	-10.5%
Total general	8,695	-25.4%

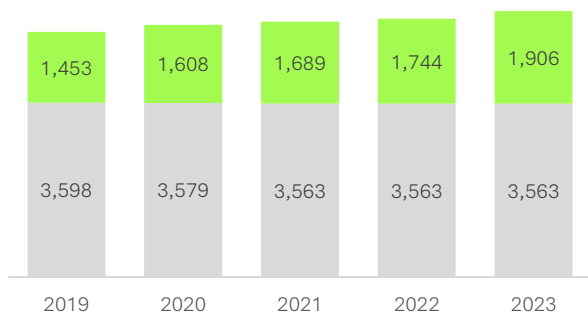
Murcia increased its installed capacity of renewable energies by 9.3%, thanks to the addition of 162 MW of solar photovoltaic power. As a result, green sources now account for 34.9% of the total production capacity in the region.

Regarding generation, renewables saw a 6.1% increase due to the boost from photovoltaic power (8.6%). However, the total generation experienced a reduction of 25.4% due to the decline in non-renewable sources (-34.7%). Consequently, green energy was able to increase its share in the regional mix to almost one-third of the total (32.7%).

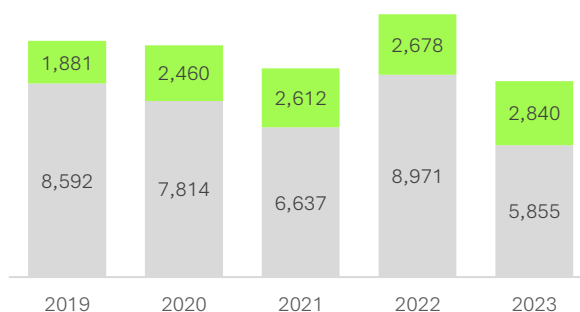
The electrical demand of the region (8,872 GWh) decreased by 2%, three-tenths less than the country's overall figure.

- Renewable
- Non-renewable

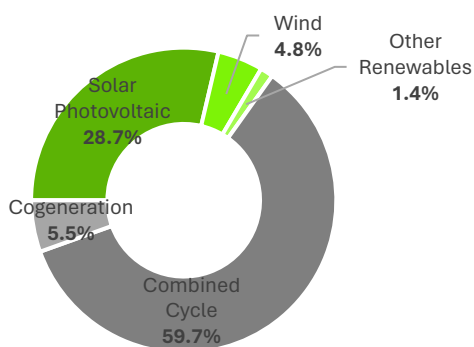
Installed capacity (MW)



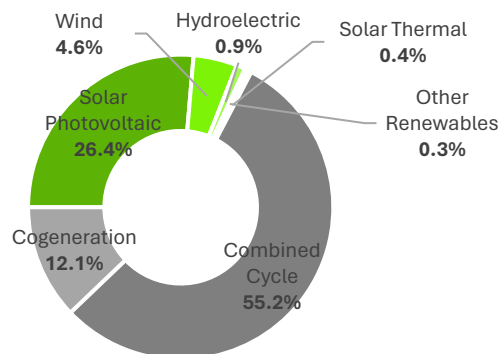
Electricity generation (GWh)



Composition of installed capacity



Composition of generation





Installed capacity 2023

	MW	Year-to-year Variation
Renewable	2,009	11.4%
Wind	1,557	14.9%
Hydroelectric	238	0.0%
Solar Photovoltaic	171	2.3%
Other Renewables	43	0.0%
Non-renewable	1,369	0.0%
Combined Cycle	1,222	0.0%
Cogeneration	147	0.0%
Total general	3,378	6.5%

Electricity generation 2023

	GWh	Year-to-year Variation
Renewable	3,865	-7.5%
Wind	2,934	-8.4%
Hydroelectric	389	7.6%
Solar Photovoltaic	296	-0.2%
Other Renewables	246	-22.4%
Non-renewable	3,264	-34.9%
Combined Cycle	2,555	-40.6%
Cogeneration	709	-0.2%
Total general	7,129	-22.4%

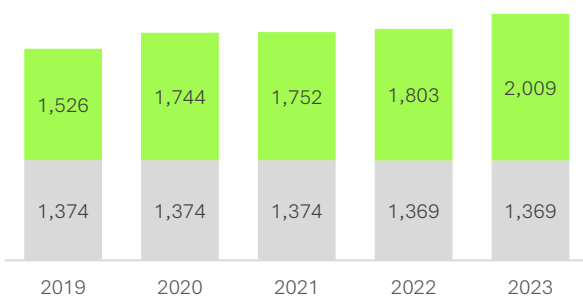
Wind energy once again drove the installation of renewable power in the community, with 202 MW added (14.9% increase), along with minimal growth in photovoltaic power. In total, renewables grew by 11.4%, surpassing 2,000 MW, which accounts for 59.5% of Navarre's production capacity.

However, the increased installed capacity did not translate into an increase in renewable electricity generation, which decreased by 7.5%, mainly due to the reduction in wind power (-8.4%). Additionally, there was also a 34.9% decrease in non-renewable generation, driven by combined cycles (-40.6%), resulting in a 22.4% decrease in the community's total generation. All of this allowed renewable generation to reach 54.2%, the highest level since 2008.

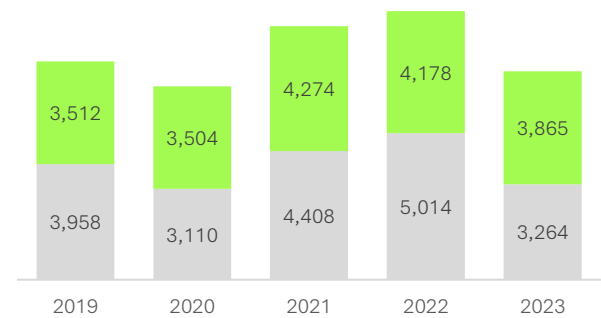
The electrical demand (4,665 GWh) decreased by 7.5%, the largest decline in the entire national system, compared to the 2.3% average.

- Renewable
- Non-renewable

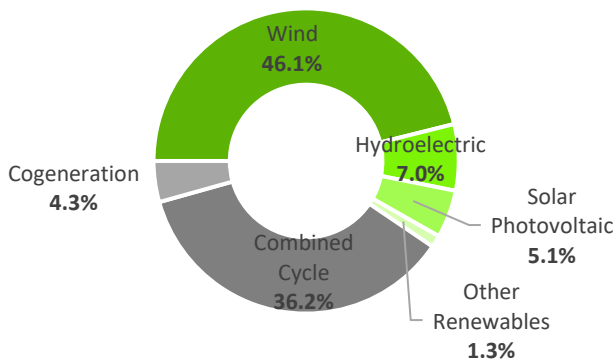
Installed capacity (MW)



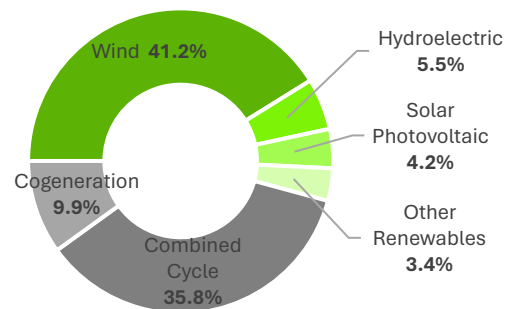
Electricity generation (GWh)



Composition of installed capacity



Composition of generation





Basque Country

Installed capacity 2023

	MW	Year-to-year Variation
Renewable	478	0.2%
Hydroelectric	178	0.0%
Wind	160	0.0%
Renewable Waste	60	0.0%
Solar Photovoltaic	53	2.2%
Other Renewables	27	0.0%
Non-renewable	2,495	0.0%
Combined Cycle	1,968	0.0%
Cogeneration	456	-0.1%
Non-renewable Waste	72	0.0%
Total general	2,973	0.0%

Electricity generation 2023

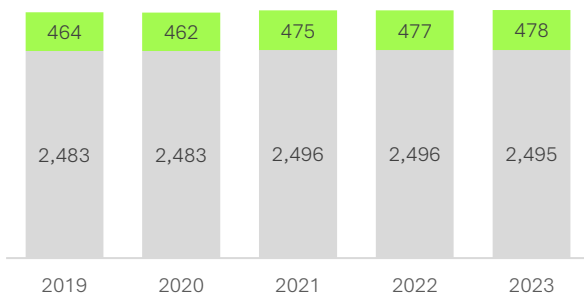
	GWh	Year-to-year Variation
Renewable	881	-16.4%
Renewable Waste	299	-8.9%
Wind	269	-15.8%
Hydroelectric	243	-16.6%
Solar Photovoltaic	58	-8.8%
Other Renewables	13	-75.8%
Non-renewable	4,219	-49.3%
Combined Cycle	2,633	-60.3%
Cogeneration	1,127	-3.7%
Non-renewable Waste	459	-10.9%
Total general	5,100	-45.6%

The Basque Country saw a year without significant changes in its power generation fleet: barely 1 MW more of photovoltaic power. Thus, the share of renewables in the community remains at 16.1%, the lowest level among all autonomous communities.

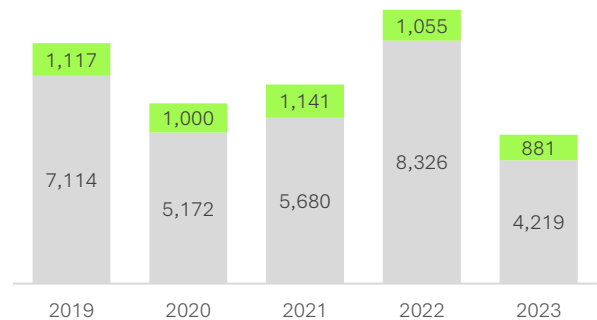
Regarding generation, 2023 was negative for renewables, as there was a 16.4% decrease. All sources ended the year with lower production than the previous year. Renewable waste remained in the top position, a circumstance that sets the Basque Country apart from the rest of the national electrical system. On the other hand, non-renewables slashed their generation by almost half (-49.3%), mainly due to the collapse of combined cycles (-60.3%), leading to a 45.6% reduction in the community's total production. The electrical demand (14,944 GWh) decreased by 1.7%, six tenths less than the national average.

- Renewable
- Non-renewable

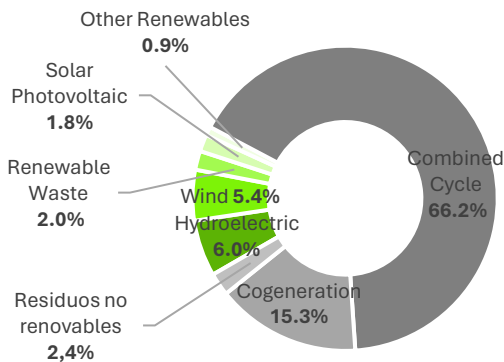
Installed capacity (MW)



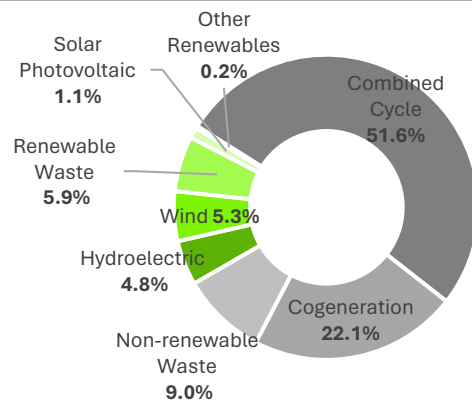
Electricity generation (GWh)



Composition of installed capacity



Composition of generation





Installed capacity 2023

	MW	Year-to-year Variation
Renewable	606	1.8%
Wind	448	2.0%
Solar Photovoltaic	102	1.7%
Hydroelectric	52	0.0%
Other Renewables	4	0.0%
Non-renewable	803	0.0%
Combined Cycle	785	0.0%
Cogeneration	18	-0.2%
Total general	1,409	0.8%

Electricity generation 2023

	GWh	Year-to-year Variation
Renewable	1,000	-9.8%
Wind	761	-10.3%
Solar Photovoltaic	146	-1.0%
Hydroelectric	83	-20.6%
Other Renewables	10	26.3%
Non-renewable	1,182	-2.6%
Combined Cycle	1,122	-5.2%
Cogeneration	61	95.3%
Total general	2,183	-6.0%

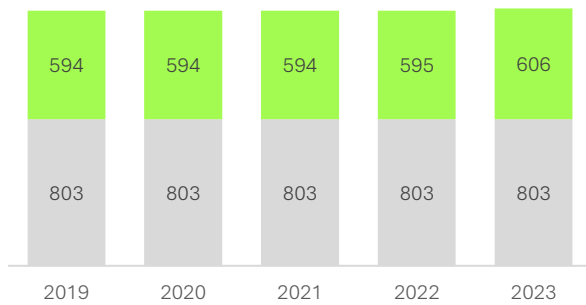
The deployment of renewable energies in La Rioja advanced very slightly in 2023, with 11 new MW in service (1.8%), of which 9 were from wind power and 2 from photovoltaic. Thus, the renewable production capacity of the region reached 75.4% of the total, although the largest source of generation remains the combined cycle.

The increase in power did not prevent the year from ending with a 9.8% decrease in renewable generation, mainly due to wind (-10.3%) and, to a lesser extent, hydroelectric (-20.3%). Although non-renewable sources also saw their production reduced by 2.6% due to lower activity of combined cycles, these remained the main electric generator of the community for the second consecutive year (54.2%).

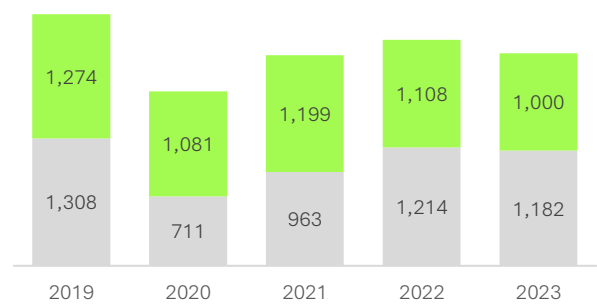
Regarding electrical demand (1,533 GWh), it experienced a 4% decrease, well above the country's average (-2.3%).

- Renewable
- Non-renewable

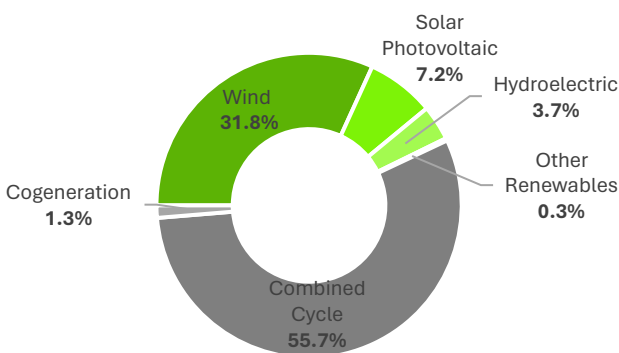
Installed capacity (MW)



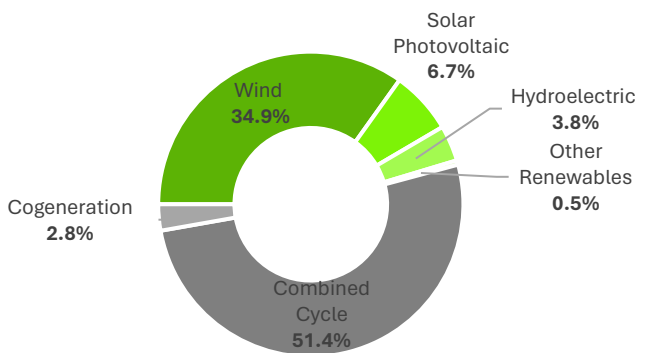
Electricity generation (GWh)



Composition of installed capacity



Composition of generation



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