Terna
Driving Energy

Monthly Report on the Electricity System
May 2024

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In May, electricity demand was 24,698 GWh, an increase compared to the same month of the previous year (+1.9%) and down compared to May 2022 (-5.6%). There was also a drop in foreign exchange (-13.0%) compared to the same month of 2023.
In 2024, electricity demand (125,902 GWh) was higher compared to the same period in 2023 (+1.1%) but was lower compared to the cumulative figure for 2022 (-3.9%). The value of electricity demand was achieved with the same number of working days (22) and with almost the same average temperature (0.4°C) as May last year. In adjusted terms the value is unchanged. The annual trend of May 2024 (compared to May 2023) for the industrial electricity consumption index was positive (+1.4%) with raw data.

In May 2024, 32.2% of the electricity demand was met via production from Non-Renewable Energy Sources, 52.5% via Renewable Energy Sources and the remainder via foreign exchange. In May, production from Renewable Energy Sources increased (+26.5%) compared to the same month of the previous year. In 2024 the operating capacity of renewables increased by 3,015 MW. This value is 896 MW higher (+42%) compared to the same period of the previous year. In the first five months of 2024, PV operating capacity increased by 2,768 MW. During the same period of 2023 the increase was 1,853 MW, recording an increase of 915 MW (+49%). In the first five months of 2024, operating wind capacity increased by 262 MW. During the same period of 2023, the increase was 247 MW, which is an increase of 15 MW (+6%).

The May total for withdrawal programmes on the DAM was approximately € 2.1 Bn, (+15% compared to the previous month and -10% compared to May 2023).
In May 2024, the spread between average bid-up and bid-down prices on the MSD was €96/MWh, (+2% compared to the previous month and -17% compared to May 2023). Total volumes decreased compared to the previous month (-2%).
In May 2024, the spread between bid-up and bid-down prices on the Balancing Market was 146 €/MWh (+5% compared to the previous month and +1% compared to May 2023). Total volumes increased compared to the previous month (+3%).

Monthly Summary and Short-Term Analysis

In May, electricity demand was 24,698 GWh, an increase compared to the same month of the previous year (+1.9%) and down compared to May 2022 (-5.6%). There was also a drop in foreign exchange (-13.0%) compared to the same month of 2023.
In 2024, electricity demand (125,902 GWh) was higher compared to the same period in 2023 (+1.1%) but was lower compared to the cumulative figure for 2022 (-3.9%).

Demand breakdown – coverage by sources

[GWh]	May 2024	May 2023	% 24/23	Jan-May 24	Jan-May 23	% 24/23
Renewable Hydro	5,586	4,145	34.7%	19,613	10,856	80.7%
Pumping Production(2)	171	136	25.9%	713	711	0.4%
Thermal	9,299	10,890	-14.6%	55,479	67,137	-17.4%
of which Biomass	*1,277*	*1,201*	*6.3%*	*6,446*	*6,250*	*3.1%*
of which Hard Coal	*245*	*560*	*-56.2%*	*1,568*	*6,805*	*-77.0%*
Geothermal	442	462	-4.3%	2,230	2,218	0.5%
Wind	1,678	1,519	10.5%	11,280	10,341	9.1%
Photovoltaic	3,990	2,928	36.3%	13,450	11,474	17.2%
Net Total Production	**21,166**	**20,080**	**5.4%**	**102,765**	**102,736**	**0.0%**
Pumping	**245**	**194**	**26.3%**	**1,019**	**1,015**	**0.4%**
Net Total Production for Consumption	**20,921**	**19,886**	**5.2%**	**101,746**	**101,721**	**0.0%**
of which RES (3)	*12,973*	*10,255*	*26.5%*	*53,019*	*41,139*	*28.9%*
of which not RES	*7,948*	*9,631*	*-17.5%*	*48,727*	*60,582*	*-19.6%*
Import	4,183	4,615	-9.4%	25,538	24,089	6.0%
Export	406	275	47.6%	1,382	1,218	13.5%
Net Foreign Exchange	**3,777**	**4,340**	**-13.0%**	**24,156**	**22,871**	**5.6%**
Electricity demand(1)	**24,698**	**24,226**	**1.9%**	**125,902**	**124,592**	**1.1%**

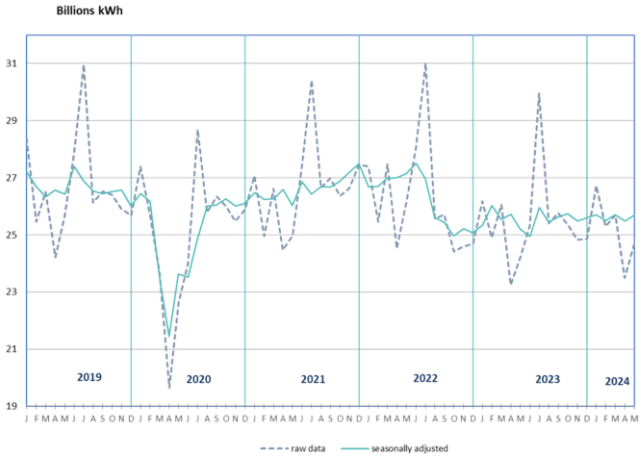
(1) Electricity Demand = Net Total Production for Consumption + Foreign Balance
(2) Pumping production is calculated assuming theoretical efficiency during the pumping phase
(3) RES Production = Renewable Hydro + Biomass + Geothermal + Wind + Photovoltaic -

Source: Terna

In May 2024, renewable hydroelectric production (+34.7%), photovoltaic production (+36.3%) and wind production (10.5%) were up, while thermal production was down (-14.6%) compared to the same month the previous year.
In 2024, there was a change in exports, which increased (+13.5%) compared to 2023. The trend in total net production for consumption in May was up (+5.2%) compared to the same month in 2023

The value of electricity demand was achieved with the same number of working days (22) and with almost the same average temperature (0.4°C) as May last year. In adjusted terms the value is unchanged.
In the first five months of the year national demand increased by 1.1% compared to the corresponding period of 2023 (+0.2% adjusted value).
The short-term data, adjusted for seasonal, calendar and temperature effects, recorded a slight increase in May 2024 compared to April (+0.8%).

Demand – seasonality adjusted



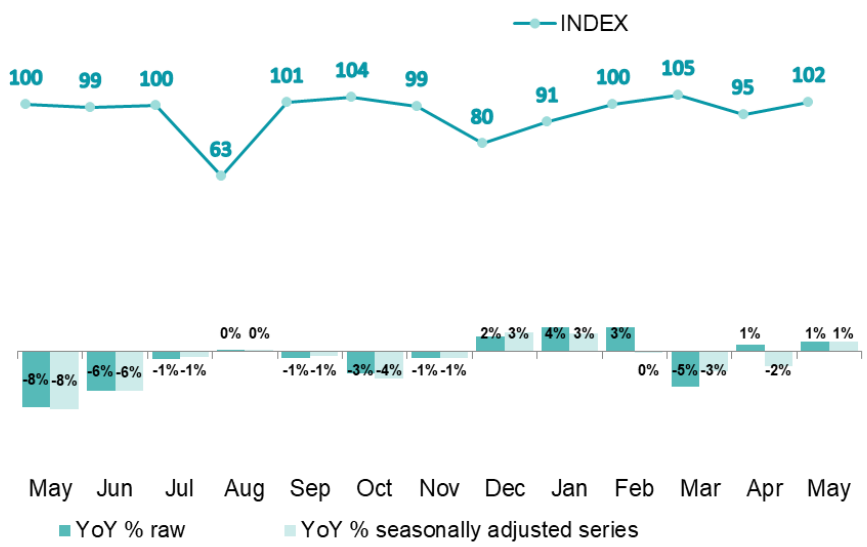
Source: Terna

When adjusted for seasonal, temperature and calendar effects, the figure for the period represents a slightly positive fluctuation (+0.8%)

IMCEI

The variation for May 2024 (compared to May 2023) was positive (+1.4%) based on the raw data; using the data adjusted for calendar differences, the change remains the same. In the first five months of the year, the index rose slightly (+0.6%).

IMCEI short-term analysis (2015 base = 100)

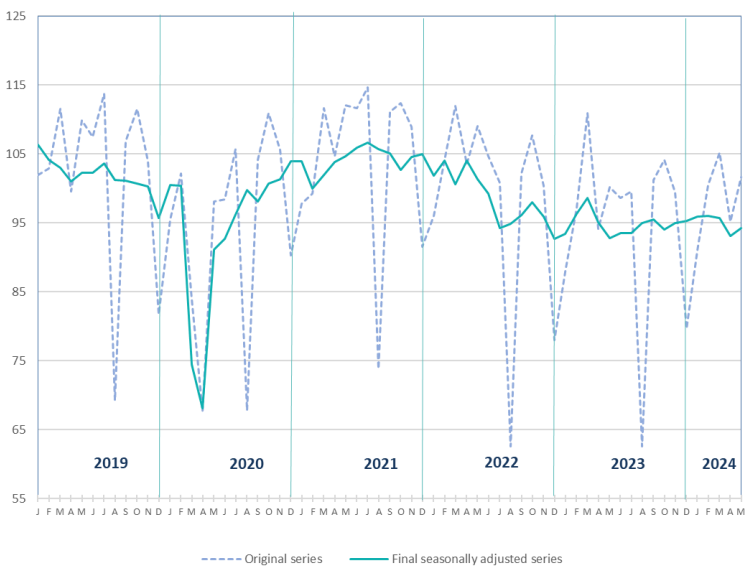


In May, the variation in the monthly index of Italian electricity consumption was positive, compared to May 2023

Source: Terna

The short-term data, adjusted for seasonal and calendar effects, showed an increase in the industrial electricity consumption index in May 2024 (+1.2%) compared to April.

Monthly Industrial Electrical Consumption Index - IMCEI (2015 base = 100)



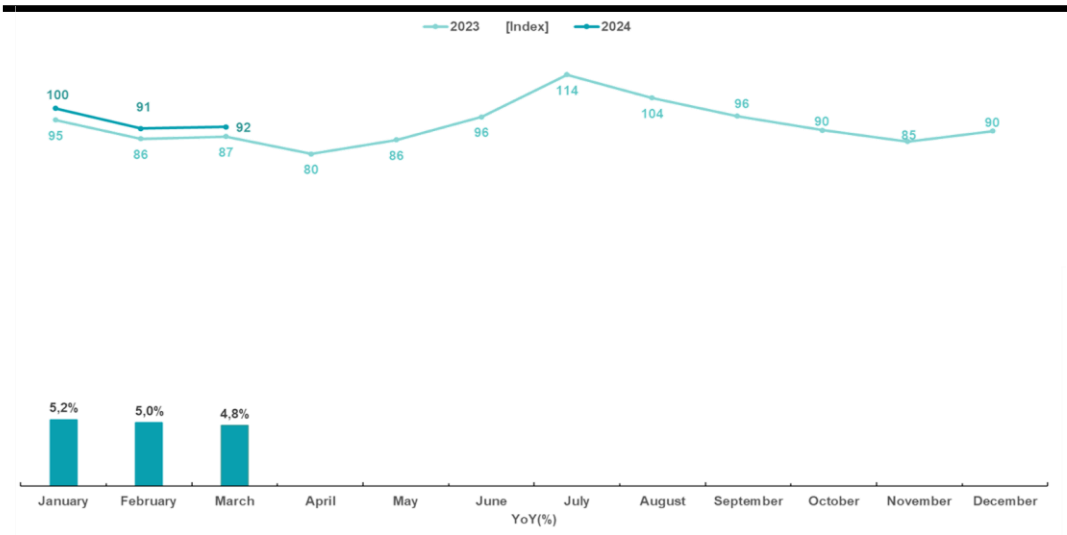
When adjusted for seasonal and calendar effects, the monthly figure for May was positive compared to the previous month

Source: Terna

IMSER

The annual trend of March 2024 (compared to March 2023) increased by +4.8% with raw data. In the period January-March 2024, electricity consumption in the services sector had increased overall by +5.0% compared to 2023.

Monthly Service Sector Consumption Index (basis 2019 = 100)

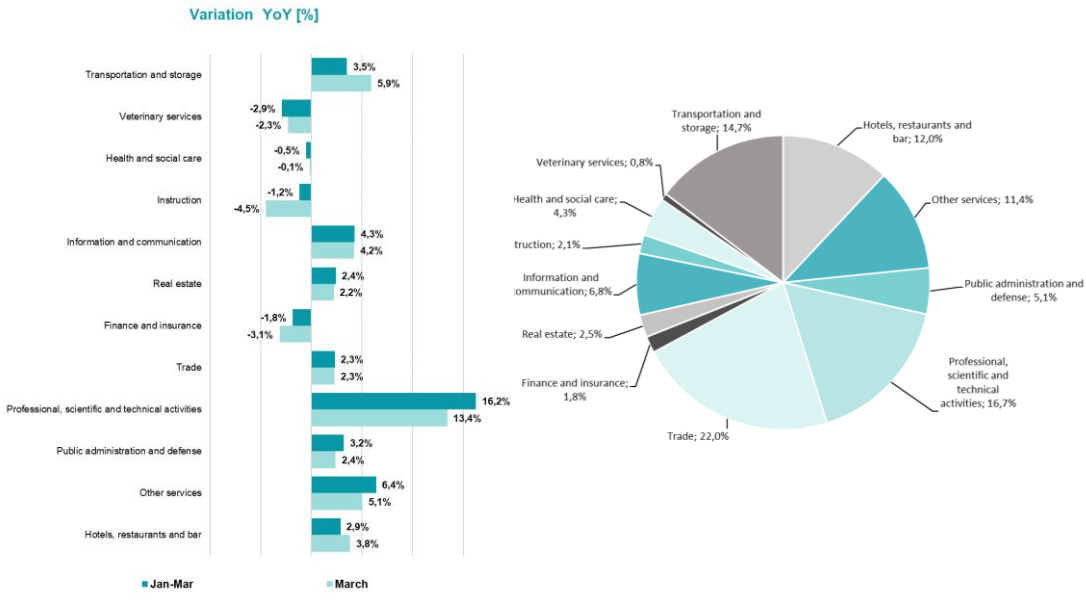


In March, the change in the monthly index of Italian electricity consumption for the services sector was positive (+4.8%) compared to March 2023

Source: Terna elaboration of data based on a sample of distributors

In detail, there was an increase in the following categories in March 2024: Hotels, restaurants and bars; Other services; Public Administration and Defence; Professional, scientific and technical services; Trade; Real estate; Information and communications. Meanwhile, there was a decrease in Finance and insurance; Education; Health and social care; Health services; and Transportation and storage.
In the first three months of the year 2024, the categories of Finance and insurance, Education, Health and social care, and Veterinary services decreased compared to 2023. There was an increase in all the other sectors.

IMSER sector analysis (basis 2019 = 100) - YOY change and annual cumulative contribution of the sectors



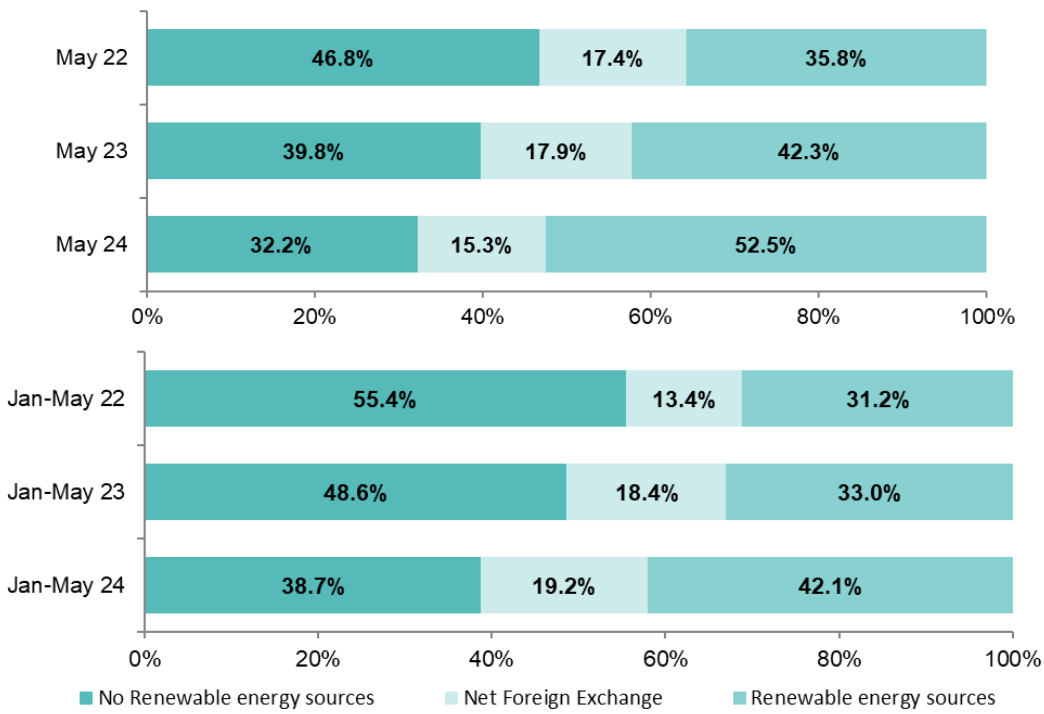
The cumulative figure for January-March 2024 was up by +5.0% compared to the same period in 2023.

Source: Terna elaboration of data based on a sample of distributors

Energy Demand Mix

In May 2024, 32.2% of the electricity demand was met via production from Non-Renewable Energy Sources, 52.5% via Renewable Energy Sources and the remainder via foreign exchange.
In 2024, electricity demand was 125,902 GWh, 38.7% of which was met via production from Non-Renewable Energy Sources, 42.1% from Renewable Energy Sources and the remainder from the foreign balance.

Demand breakdown – coverage by sources

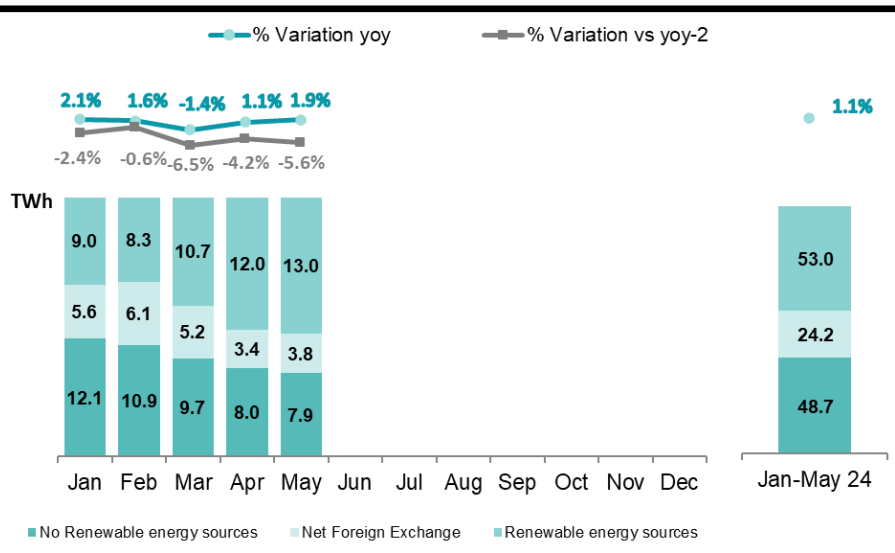


Coverage of demand from renewable sources grew from 42.3% in May 2023 to 52.5% in May 2024

In 2024 coverage of demand from non-renewables fell from 48.6% in 2023 to 38.7% in 2024

Source: Terna

2024 trend in demand breakdown and difference from 2023 and 2022



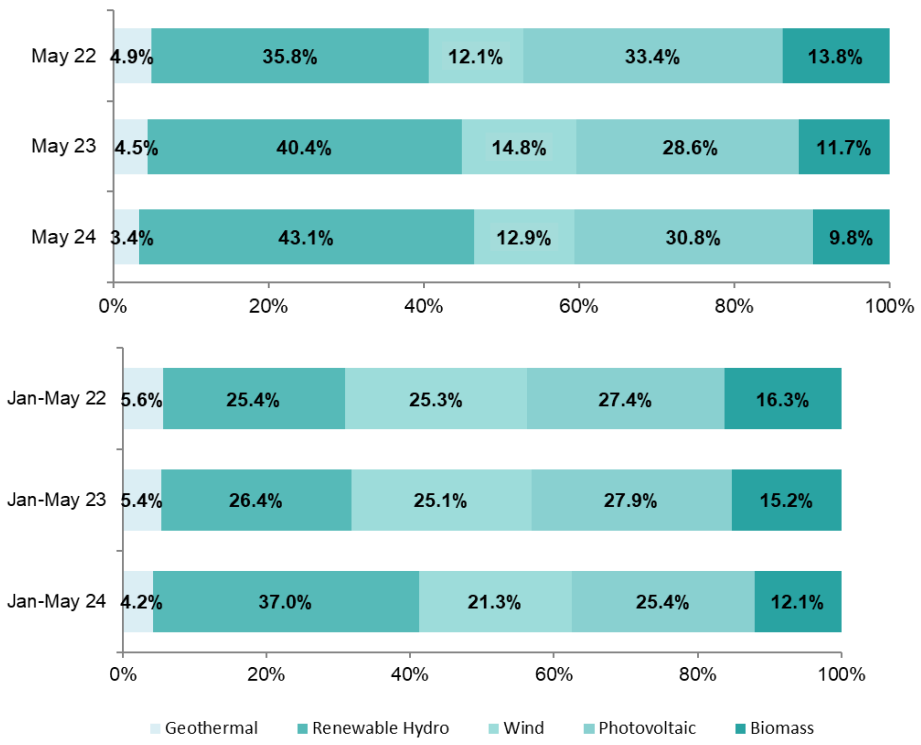
In 2024, electricity demand on the grid is higher than 2023 (+1.1%) and down compared to the cumulative figure for 2022 (-3.9%).
In 2024, energy production from renewable sources totalled 53.0 TWh, up compared to 2023 (+28.9%)

Source: Terna

Details of Renewable Energy Sources

In May, production from Renewable Energy Sources increased (+26.5%) compared to the same month of the previous year. Specifically, there was an increase in renewable hydroelectric production (+34.7%), in photovoltaic production (+36.3%), and in wind production (+10.5%).

RES Production - Breakdown

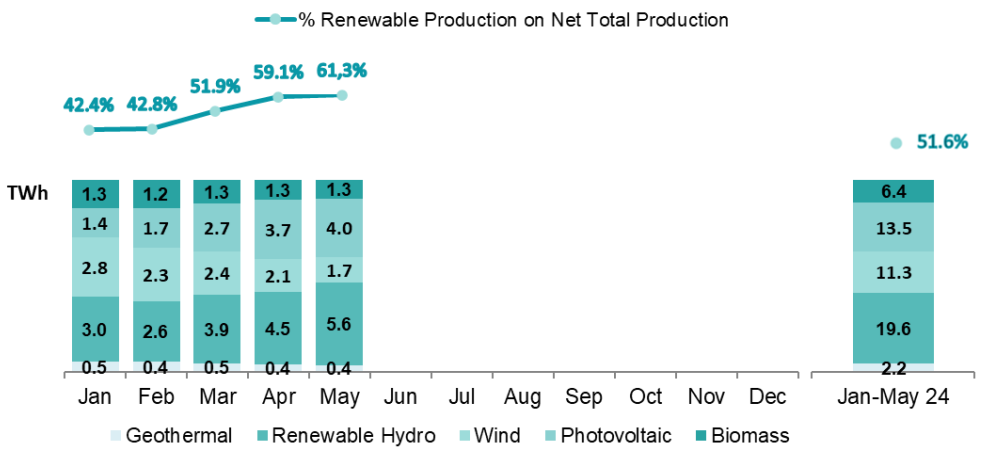


In May 2024, the greater contribution of renewable energy sources to the total is attributed to renewable hydroelectric production (43.1%) and photovoltaic production (30.8%)

In 2024 the ratio of renewable hydroelectric production increased while the contribution from the other sources decreased overall compared to 2023

Source: Terna

2024 trend in net production from RES and difference from 2023



In May 2024, production from RES represented 61.3% of total net national production, an increase compared to the same month in 2023 (51.1%). In 2024, production from RES represented 51.6% of total net national production, an increase compared to the cumulative figure for 2023 (40.0%)

Source: Terna

Historical Energy Balance Sheets

In 2024, total net production allocated for consumption (101,746 GWh) met 80.8% of national electricity demand (125,902 GWh).

2024 Historical Monthly Energy Balance Sheet

[GWh]	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Renewable Hydro	3,033	2,606	3,855	4,534	5,586								19,613
Pumping Production [2]	64	106	158	214	172								713
Thermal	13,496	12,178	11,128	9,378	9,299								55,479
of which Biomass	*1,332*	*1,231*	*1,343*	*1,264*	*1,277*								*6,446*
of which Hard Coal	*345*	*467*	*243*	*268*	*245*								*1,568*
Geothermal	458	432	460	438	442								2,230
Wind	2,802	2,295	2,414	2,091	1,678								11,280
Photovoltaic	1,371	1,714	2,672	3,703	3,990								13,450
Net Total Production	**21,224**	**19,331**	**20,687**	**20,357**	**21,166**								**102,765**
Pumping	**92**	**151**	**226**	**305**	**245**								**1,019**
Net Total Production for Consumption	**21,132**	**19,180**	**20,461**	**20,052**	**20,921**								**101,746**
of which RES [3]	*8,995*	*8,278*	*10,743*	*12,029*	*12,973*								*53,019*
of which not RES	*12,137*	*10,902*	*9,718*	*8,023*	*7,948*								*48,727*
Import	5,868	6,258	5,424	3,805	4,183								25,538
Export	279	145	187	365	406								1,382
Net Foreign Exchange	**5,589**	**6,113**	**5,237**	**3,440**	**3,777**								**24,156**
Electricity demand [1]	**26,721**	**25,293**	**25,698**	**23,492**	**24,698**								**125,902**

Source: Terna

In 2024, net total production remained steady compared to the same period in 2023, and peak electricity demand was reached in January, with 26,721 GWh.

The developments in the monthly balance sheet for 2023 are provided below.

2023 Historical Monthly Energy Balance Sheet

[GWh]	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Renewable Hydro	2,053	1,530	1,604	1,524	4,145	4,878	4,402	3,884	3,546	3,269	4,125	3,284	38,244
Pumping Production [2]	135	99	172	168	136	95	104	160	100	137	129	95	1,530
Thermal	15,618	14,756	14,633	11,240	10,890	12,256	15,608	12,365	13,529	12,763	11,269	13,007	157,934
of which Biomass	*1,366*	*1,200*	*1,349*	*1,135*	*1,201*	*1,233*	*1,342*	*1,317*	*1,273*	*1,274*	*1,207*	*1,212*	*15,108*
of which Hard Coal	*2,294*	*1,868*	*1,881*	*202*	*560*	*1,226*	*1,041*	*662*	*914*	*461*	*579*	*419*	*12,108*
Geothermal	458	414	442	442	462	436	445	439	445	462	444	458	5,347
Wind	2,281	1,816	2,561	2,164	1,519	1,034	1,347	1,735	1,645	1,863	2,968	2,441	23,374
Photovoltaic	1,092	1,721	2,635	3,098	2,928	3,515	3,868	3,738	2,991	2,277	1,534	1,198	30,595
Net Total Production	**21,637**	**20,336**	**22,047**	**18,636**	**20,080**	**22,214**	**25,774**	**22,321**	**22,256**	**20,770**	**20,469**	**20,483**	**257,023**
Pumping	**193**	**142**	**246**	**240**	**194**	**136**	**148**	**228**	**143**	**195**	**184**	**136**	**2,185**
Net Total Production for Consumption	**21,444**	**20,194**	**21,801**	**18,396**	**19,886**	**22,078**	**25,626**	**22,093**	**22,113**	**20,575**	**20,285**	**20,347**	**254,838**
of which RES [3]	*7,250*	*6,680*	*8,591*	*8,363*	*10,255*	*11,096*	*11,405*	*11,113*	*9,900*	*9,145*	*10,278*	*8,593*	*112,668*
of which not RES	*14,194*	*13,514*	*13,210*	*10,033*	*9,631*	*10,982*	*14,221*	*10,980*	*12,213*	*11,430*	*10,007*	*11,754*	*142,170*
Import	5,080	4,943	4,445	5,006	4,615	3,546	4,651	3,657	3,908	4,987	4,810	4,924	54,572
Export	352	233	188	170	275	314	323	338	248	211	266	402	3,320
Net Foreign Exchange	**4,728**	**4,710**	**4,257**	**4,836**	**4,340**	**3,232**	**4,328**	**3,319**	**3,660**	**4,776**	**4,544**	**4,522**	**51,252**
Electricity demand [1]	**26,172**	**24,904**	**26,058**	**23,232**	**24,226**	**25,310**	**29,954**	**25,412**	**25,773**	**25,351**	**24,829**	**24,869**	**306,090**

Source: Terna

In 2023, the month with the highest demand for electricity was July, with 29,954 GWh

(1) Electricity Demand = Net Total Production for Consumption + Foreign Balance
(2) Pumping production is calculated assuming theoretical efficiency during the pumping phase
(3) RES Production = Renewable Hydro + Biomass + Geothermal + Wind + Photovoltaic

Demand by Operational Area

In May 2024, demand increased in the Northern zone (TO-MI-VE), and in the Southern zone (NA), the Centre (RM-FI) and on the Islands (PA-CA) compared to the same period of the previous year.

Demand by Operational Area

[GWh]	Turin	Milan	Venice	Florence	Rome	Naples	Palermo	Cagliari
May 2024	2,475	5,016	3,873	4,103	3,476	3,590	1,478	687
May 2023	2,361	5,068	3,750	4,008	3,432	3,512	1,458	637
% May 24/23	4.8%	-1.0%	3.3%	2.4%	1.3%	2.2%	1.4%	7.8%
Cumulated 2024	12,720	25,757	19,820	20,609	17,882	18,029	7,628	3,457
Cumulated 2023	12,634	26,132	19,333	19,971	17,592	17,988	7,518	3,424
% Cumulated 24/23	0.7%	-1.4%	2.5%	3.2%	1.6%	0.2%	1.5%	1.0%

In 2024, the Y-o-Y percentage change in demand is 2.5% in the Centre, 1.3% in the Islands, 0.3% in the North and 0.2% in the South

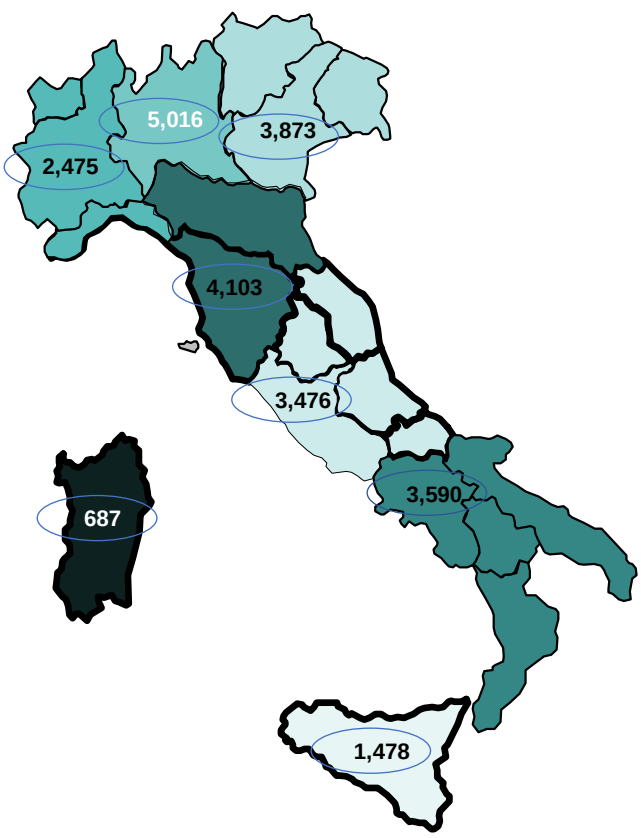
Source: Terna

Demand by Operational Area – Map Chart

[GWh]

The regions are combined in clusters on the basis of production and consumption:

- TURIN: Piedmont - Liguria - Valle d'Aosta
- MILAN: Lombardy (*)
- VENICE: Friuli Venezia Giulia - Greater Venice - Trentino Alto Adige
- FLORENCE: Emilia Romagna (*) - Tuscany
- ROME: Lazio - Umbria - Abruzzo - Molise - April
- NAPLES: Campania - Apulia - Basilicata - Calabria
- PALERMO: Sicily
- CAGLIARI: Sardinia



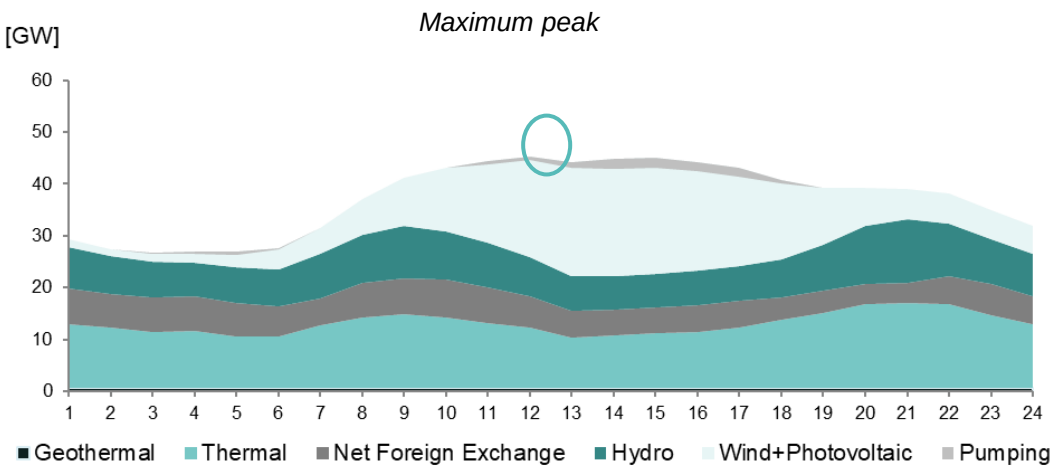
Source: Terna

(*) In these two regions, the geographical borders do not correspond to the electrical borders. Lombardy includes production plants that are part of the geographical administrative territory of Emilia Romagna.

Peak Demand

In May 2024, Peak Demand was recorded on **Tuesday 21 May between 11:00 and 12:00** and was 44,720MW (+2.6% Y-o-Y). The hourly demand diagram of the peak day is presented below.

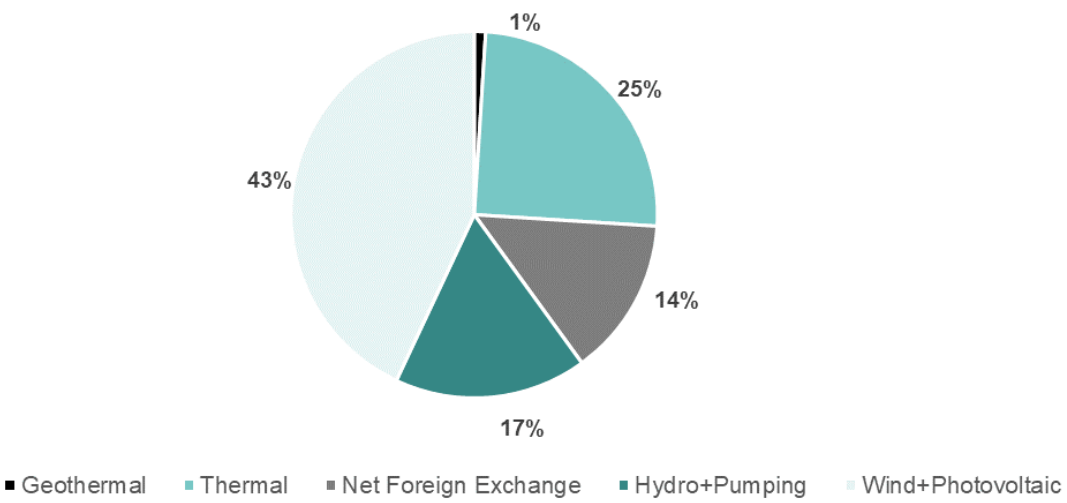
Peak Demand



At peak, the contribution from thermal production was 11,764 MW, down (-36.9%) compared to the contribution from thermal production at the May 2023 peak (18,629 MW)

Source: Terna

Coverage of demand - 21 May 2024 11:00-12:00



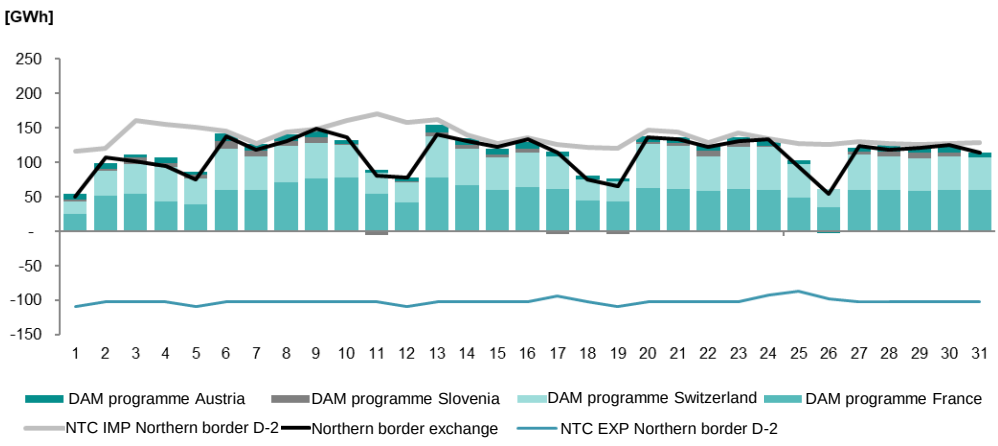
At its peak, production from wind and photovoltaic sources contributed to covering 43% of demand, with thermal production covering 25% and foreign exchange covering 14%.

Source: Terna

Net Foreign Exchange – May 2024

In May, there was good saturation of the planned figure for imported NTC compared to the exchange programmes on the Northern border.

Net Foreign Exchange on the Northern border



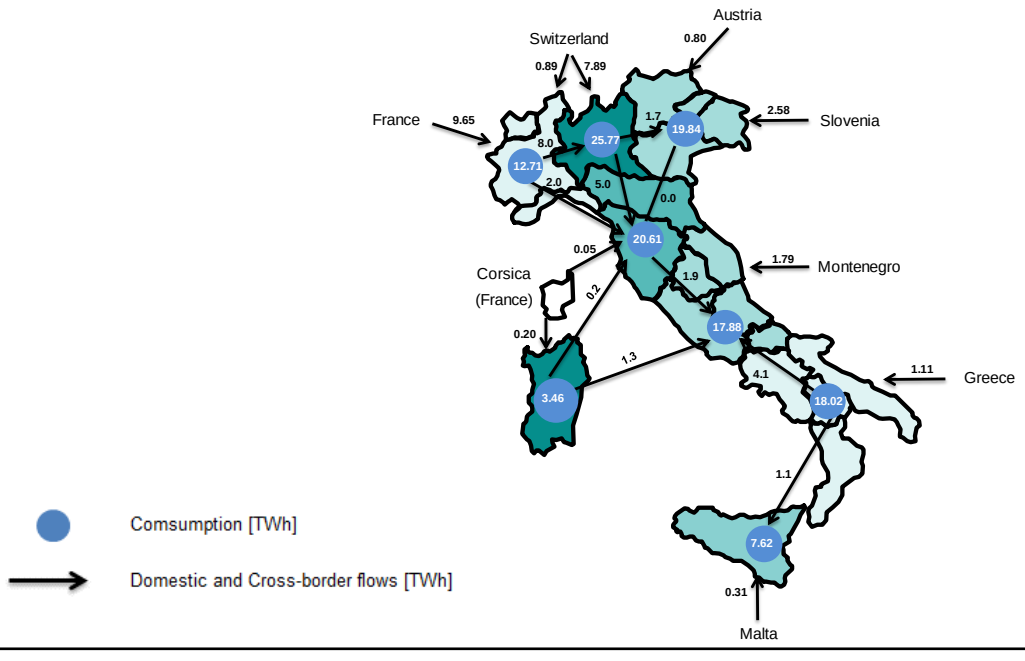
In May 2024, imports decreased Y-o-Y (-9.4%) amounting to 4,183 GWh and exports increased Y-o-Y (+47.6%), amounting to 406 GWh

Source: Terna

Balance of Physical Exchanges – Annual Cumulative Figure

The balance of physical electricity exchanges mainly shows the energy flows among the various areas identified in the Italian electricity system.

Balance of physical electricity exchanges: map



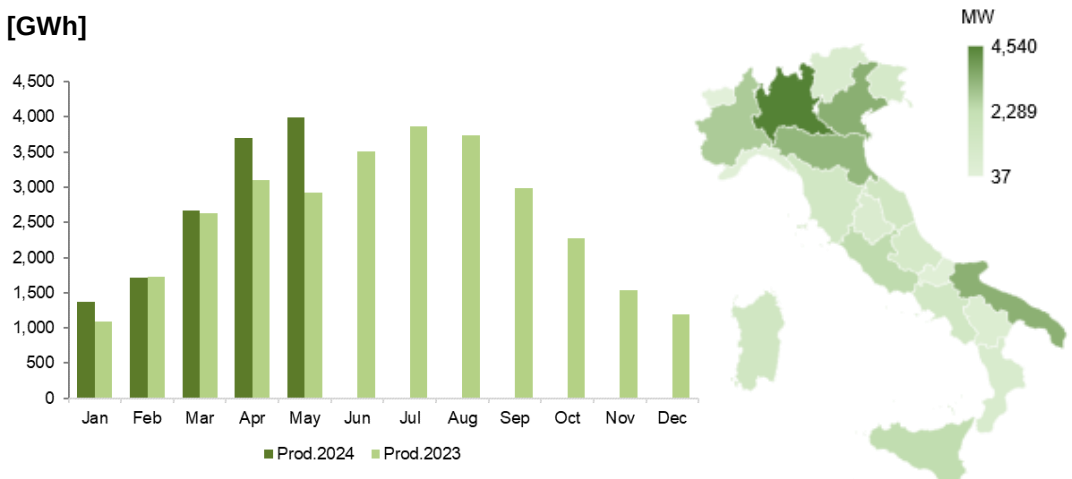
In 2024, a net exchange was recorded from the Northern zone to Emilia Romagna and Tuscany of 7.0 TWh. The mainland recorded a net exchange towards Sicily of 1.1 TWh.

Source: Terna

Production and Installed Capacity

Energy produced from photovoltaic sources in May 2024 reached 3,990 GWh, an increase compared to the same month of the previous year (+1,062 GWh).

Photovoltaic production (left) and distribution of operating capacity[1] (right)



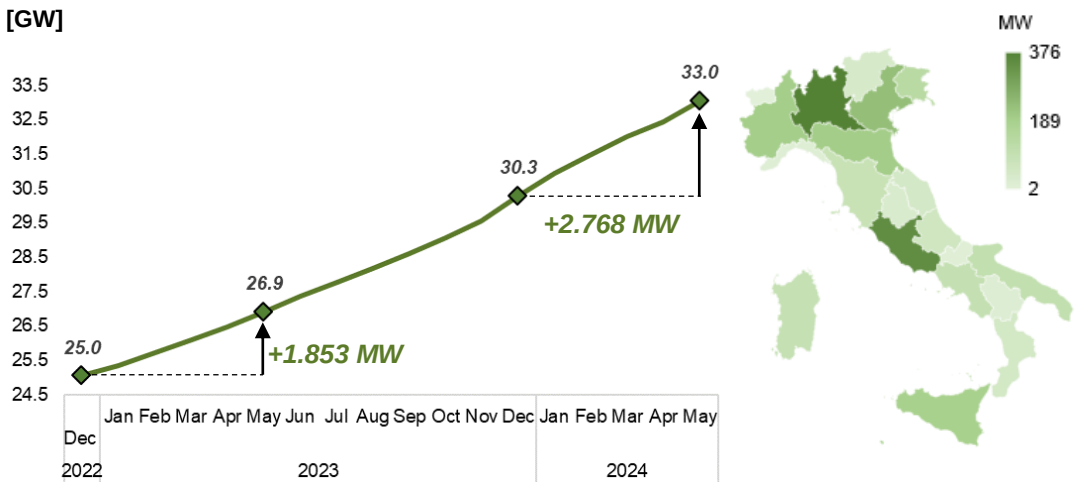
Production from photovoltaic sources increased compared to the same month of the previous year (+36.3%)

1. The operating capacity takes into account new activations, upgrades and decommissioning of plants

Source: Terna

In the first five months of 2024, operating capacity increased by 2,768 MW. During the same period of 2023 the increase was 1,853 MW, recording an increase of 915 MW (+49%).

Cumulative operating capacity (left) and distribution of new activations 2024 (right)

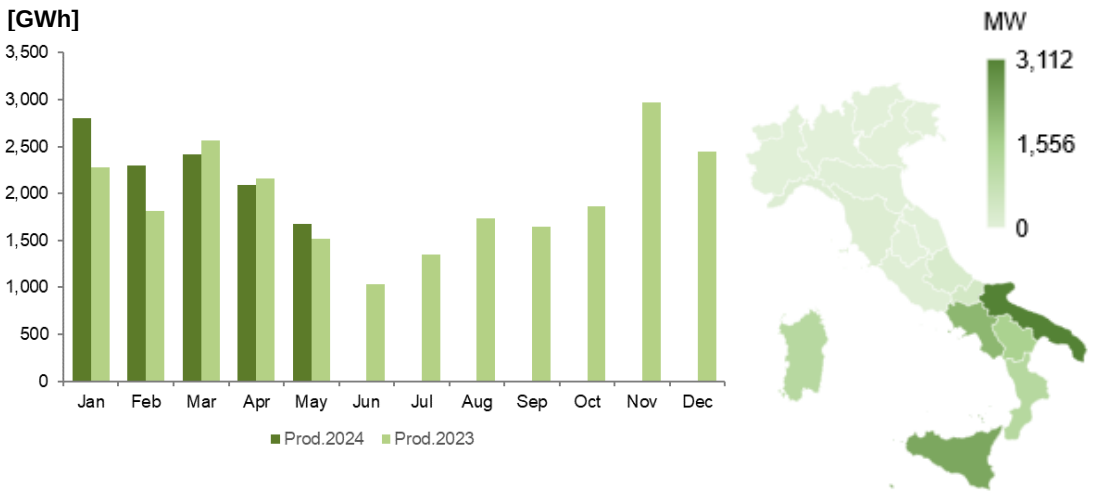


The region with the greatest increase is Lombardy with 376 MW, followed by Lazio (+349 MW) and Veneto (+233 MW)

Source: Terna

Energy produced from wind production sources in May 2024 reached 1,678 GWh, an increase compared to the same month of the previous year (+159 GWh).

Wind production (left) and distribution of operating capacity[1] (right)



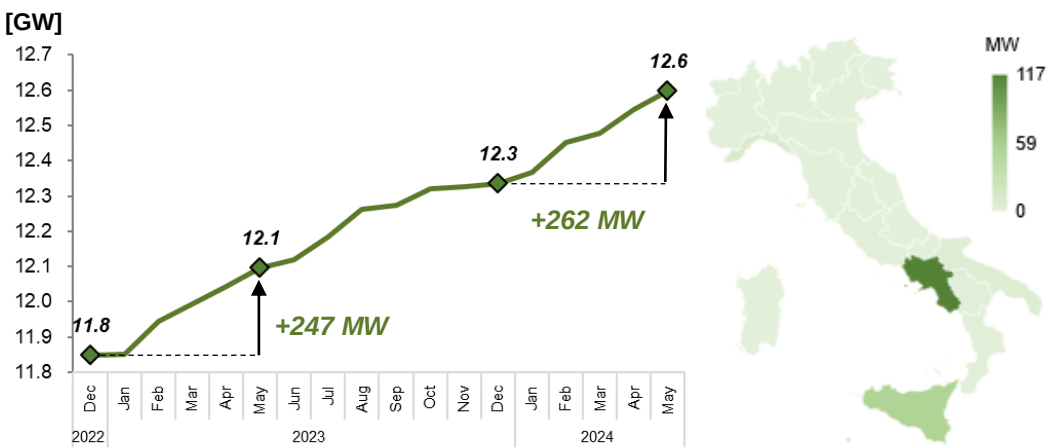
Production from wind sources increased compared to the same month of the previous year (+10.5%)

1. The operating capacity takes into account new activations, upgrades and decommissioning of plants

Source: Terna

In the first five months of 2024, operating capacity increased by 262 MW. During the same period of 2023, the increase was 247 MW, which is an increase of 15 MW (+6%).

Cumulative operating capacity (left) and distribution of new activations 2024 (right)

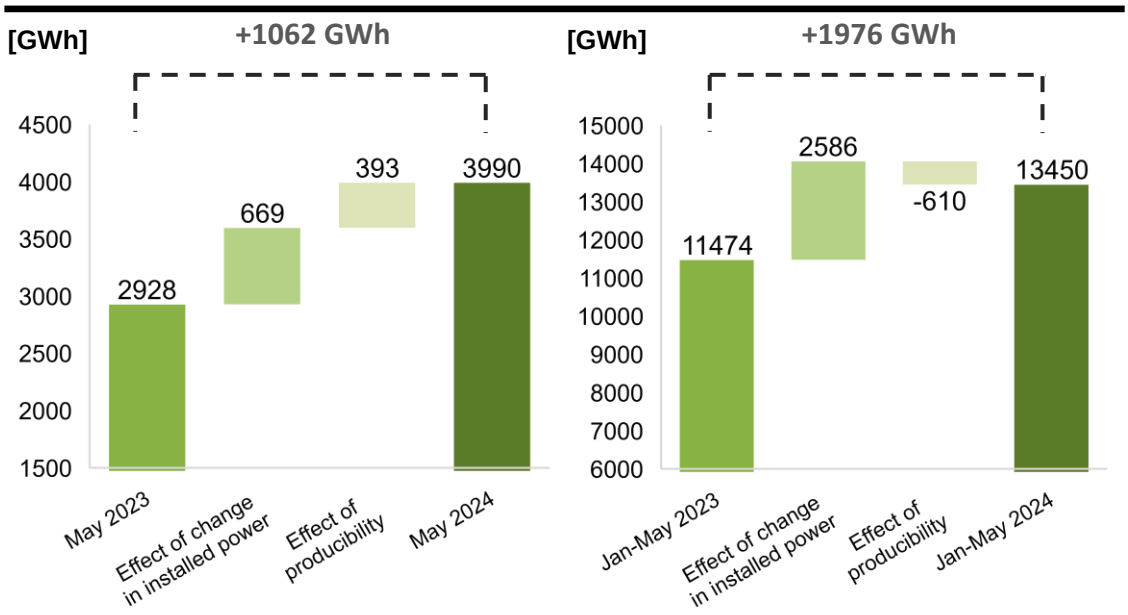


The region with the greatest increase is Campania with 117 MW, followed by Sicily (+52 MW) and Liguria (+10 MW)

Source: Terna

In the month of May, the increase in photovoltaic production (+1,062 GWh) was due to the combined effect of increased operating capacity (+669 Gwh) and increased solar radiation (+393 GWh).
In 2024, increased production (+1,976 GWh) is the result of the positive contribution of greater installed power (+2,586 GWh), which amply makes up for the lower producibility (-610 GWh).

Breakdown of effects of photovoltaic production - monthly (left) and annual cumulative (right)



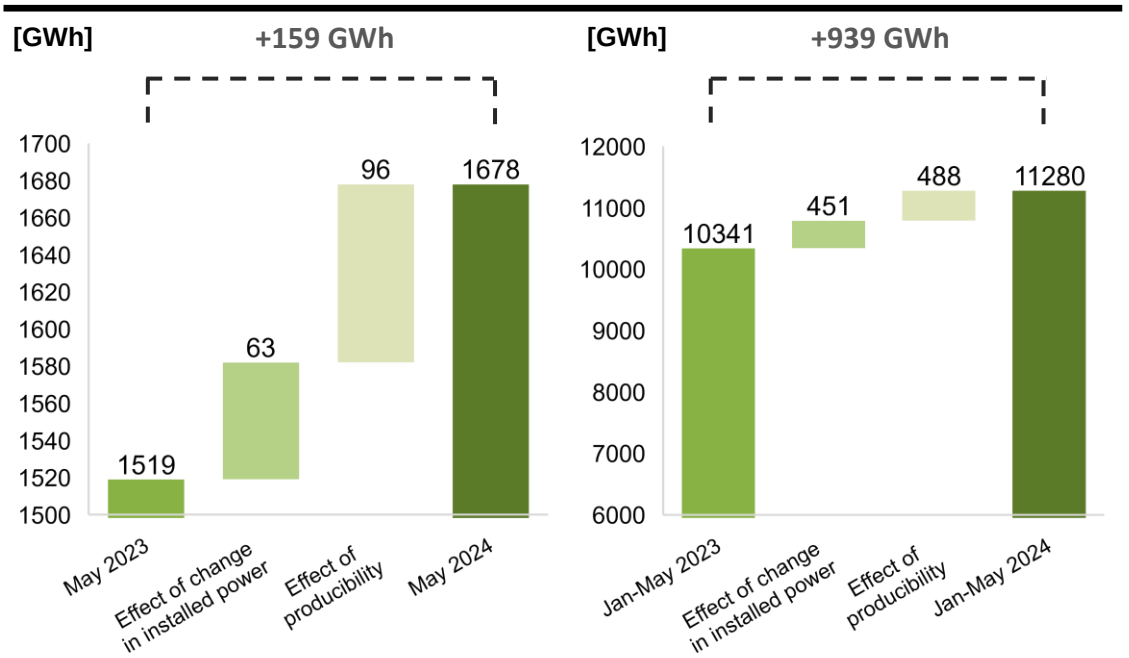
In May, photovoltaic production increased by +36.3% compared to May 2023.

In 2024, production increased +17.2% compared to the same period of 2023.

Source: Terna calculation

In May 2024, there was an increase in production (+159 GWh) due both to the effect of the increase in operating wind capacity (+63 GWh) and to the effect of producibility (+96 GWh).
In 2024, increased production (+939 GWh) is the result of the positive contribution of greater installed power (+451 GWh) and producibility (+488 GWh).

Breakdown of effects of wind production - monthly (left) and annual cumulative (right)



In May, wind production increased by +10.5% compared to May 2023.

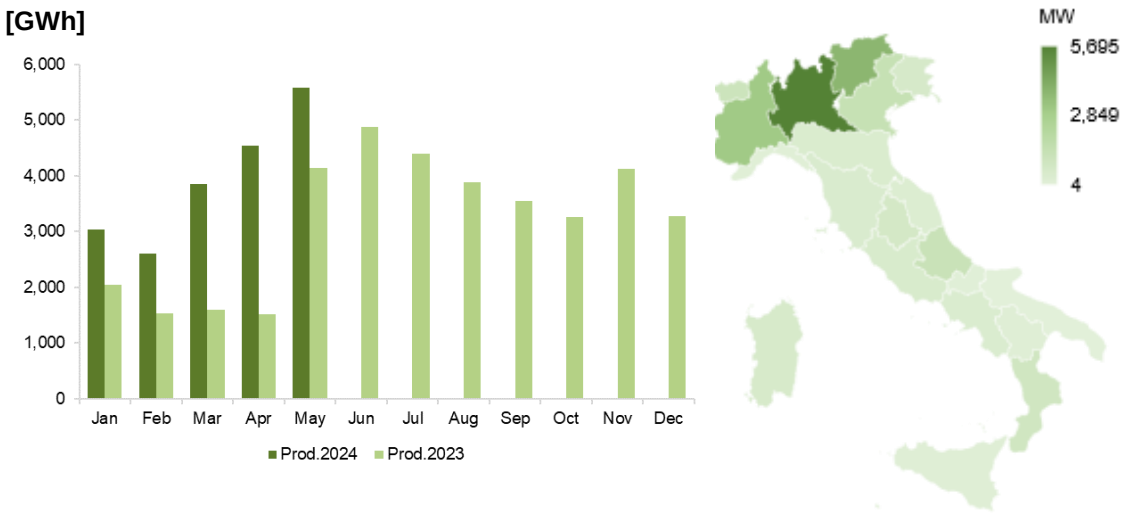
In 2024, production increased +9.1% compared to the same period of the previous year.

Source: Terna calculation

Note: for calculation of breakdown of the effect of power and producibility see legend

Energy produced from renewable hydroelectric production sources in May 2024 reached 5,586 GWh, an increase compared to the same month of the previous year (+1,440 GWh).

Renewable hydroelectric production (left) and distribution of operating capacity[1] (right)



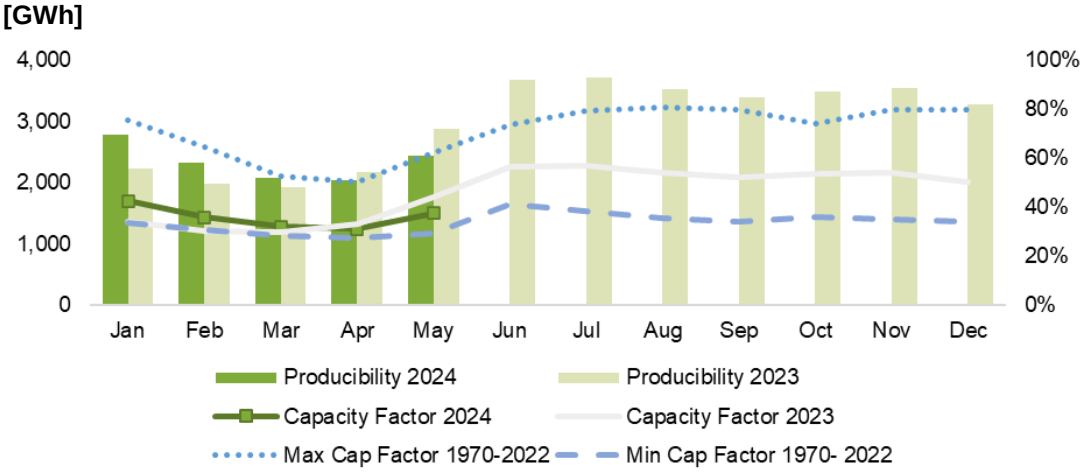
Production from renewable hydroelectric production sources increased compared to the same month of the previous year (+34.7%)

1. The operating capacity takes into account new activations, upgrades and decommissioning of plants.

Source: Terna

In May, hydroelectric producibility decreased (-15.1%) compared to the same month of the previous year.

Hydroelectric Producibility and Reservoir Percentage



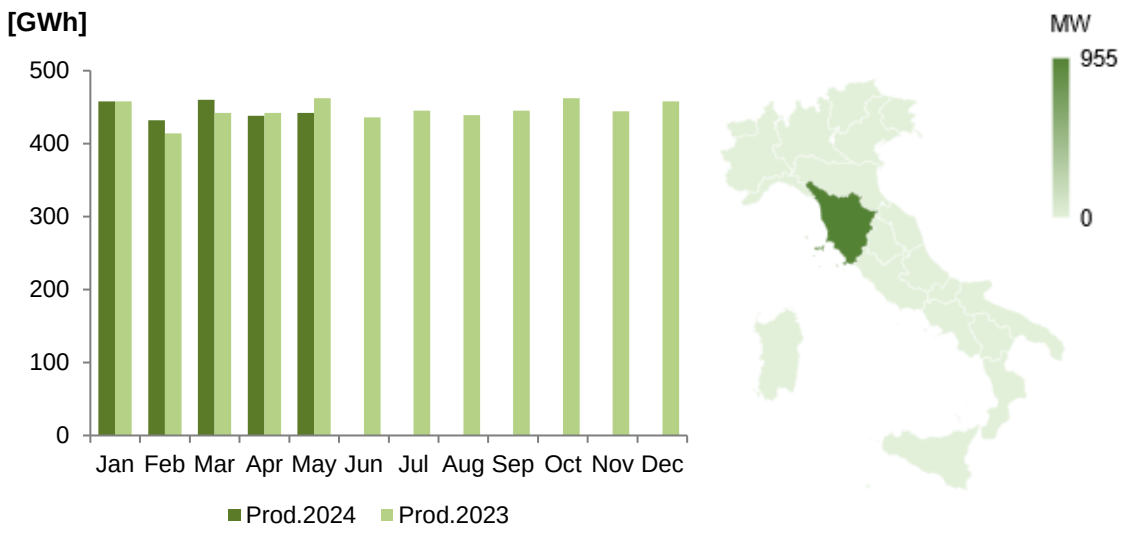
In May 2024, considering Italy as a whole, the ratio between the reservoir and the maximum reservoir capacity was 37.6%, a drop compared to the same month in 2023 (44.3%).

	Reservoir Capacity	NORTH	CENTRE SOUTH	ISLANDS	TOTAL
May 23	*[GWh]*	1.337	956	158	2.451
	% (capacity/max capacity)	30.9%	52.7%	41.4%	37.6%
May 24	*[GWh]*	1.358	1.283	247	2.888
	% (capacity/max capacity)	31.4%	70.7%	64.8%	44.3%

Source: Terna

Energy produced from geothermal production sources in May 2024 reached 442 GWh, a decrease compared to the same month of the previous year (-20 GWh).

Geothermal production (left) and distribution of operating capacity[1] (right)



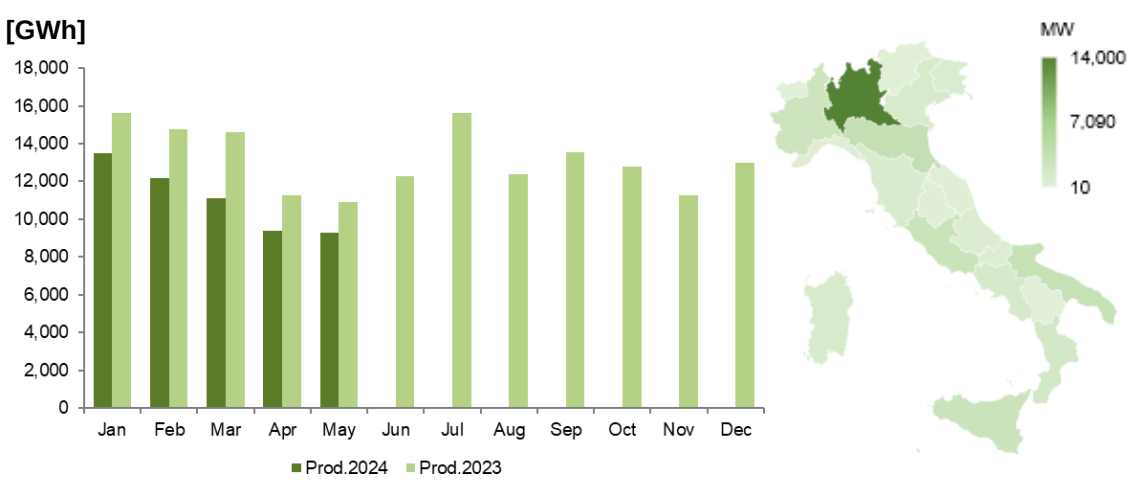
Production from geothermal sources decreased (-4.3%) compared to the same month of the previous year

1. The operating capacity takes into account new activations, upgrades and decommissioning of plants

Source: Terna

Energy produced from thermal production sources in May 2024 reached 9,299 GWh, down compared to the same month of the previous year (-1,591 GWh).

Thermal production (left) and distribution of operating capacity[1] (right)



Production from thermal sources decreased (-14.6%) compared to the same month of the previous year

Source: Terna

In 2024 the operating capacity of renewables increased by 3,015 MW. This value is 896 MW higher (+42%) compared to the same period of the previous year.

Variation in monthly operating capacity and number of plants per Source in Italy 2024[1]

[MW]	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Photovoltaic	656	562	503	446	601								**2.768**
Wind	32	85	25	67	53								**262**
Hydroelectric	-1	-1	3	1	3								**5**
Geothermal & Biomass	0	-3	-17	-1	0								**-21**
Total	**687**	**643**	**514**	**513**	**658**								**3,015**

Number of Plants	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Photovoltaic	31,380	32,737	29,257	25,241	27,857								**146,472**
Wind	12	8	5	4	6								**35**
Hydroelectric	6	2	6	0	6								**20**
Geothermal & Biomass	-1	5	3	4	2								**13**
Total	**31,397**	**32,752**	**29,271**	**25,249**	**27,871**								**146,540**

Source: Terna

The evolution of operational capacity by source in 2023 is shown below.

Variation in monthly operating capacity and number of plants per Source in Italy 2023[1]

[MW]	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Photovoltaic	296	376	386	360	435	468	406	396	424	470	492	724	**5,234**
Wind	4	93	48	50	53	25	63	80	11	45	6	11	**487**
Hydroelectric	1	2	7	1	2	3	-6	-1	6	7	6	4	**33**
Geothermal & Biomass	-4	0	1	-2	9	1	-5	39	0	1	0	0	**42**
Total	**297**	**471**	**442**	**409**	**499**	**498**	**458**	**514**	**441**	**523**	**503**	**740**	**5,795**

Number of Plants	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Photovoltaic	29,651	35,807	37,586	30,690	35,485	33,722	29,478	25,845	27,249	30,145	26,723	31,548	**373,929**
Wind	0	17	7	3	3	3	5	9	5	18	6	6	**82**
Hydroelectric	6	3	9	3	12	6	3	2	8	6	4	8	**69**
Geothermal & Biomass	2	7	3	6	9	6	0	8	7	5	1	2	**56**
Total	**29,659**	**35,834**	**37,604**	**30,702**	**35,509**	**33,737**	**29,486**	**25,864**	**27,269**	**30,174**	**26,734**	**31,564**	**374,136**

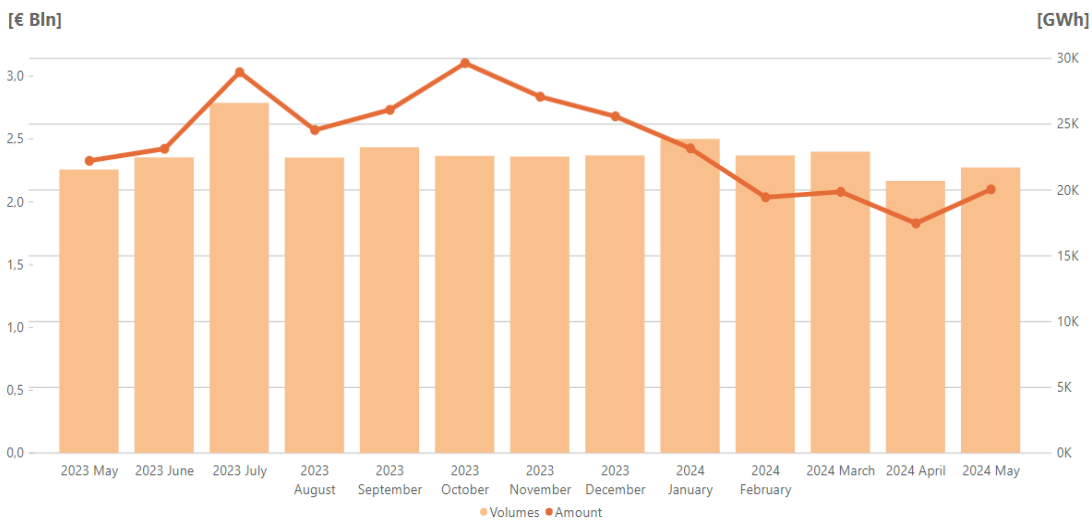
Source: Terna

1. *The operating capacity and the number of plants take into account new activations, upgrades and decommissioning of plants*

Day-Ahead Market

The May total for withdrawal programmes on the DAM was approximately € 2.1 Bn, (+15% compared to the previous month and -10% compared to May 2023).
The average PUN in May 2024 was approximately 94.9 €/MWh (+9% compared to the previous month and -10% compared to May 2023). There was also a change of +5% in demand compared to the previous month and of +1% compared to May 2023.

Day Ahead Market – amounts and volumes

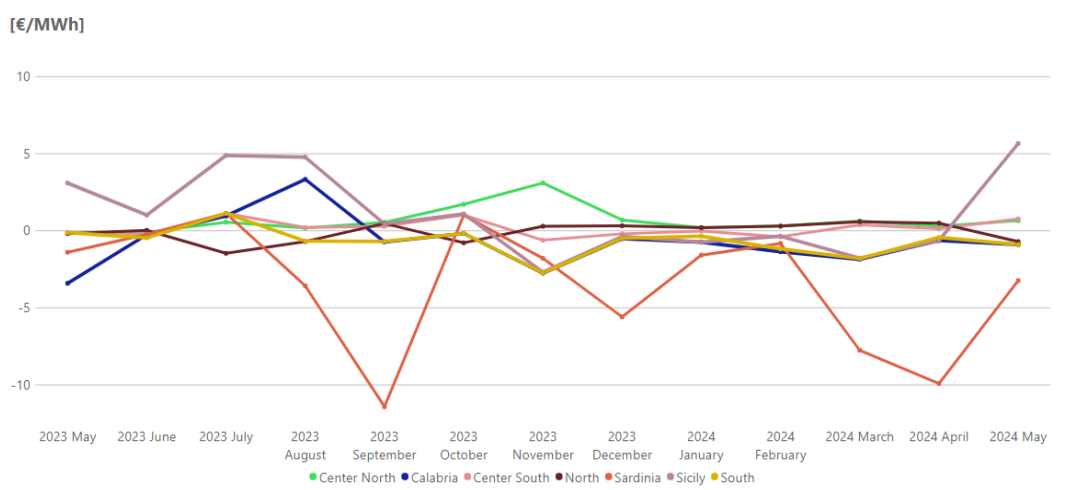


Total value in May 2024 -10% compared to May 2023

Source: Terna calculation on GME data

In May, the zonal prices were essentially in line with the PUN. In particular, the zones of Calabria, the North and the South recorded an average spread of -€0.8/MWh, while the Centre-North and Centre-South zones showed an average spread of around +€0.7/MWh. The exceptions were the zones of Sicily and Sardinia, which recorded the highest spreads, of +€5.6/MWh and -€3.3/MWh respectively.

Spread compared to the PUN



Average spread in May 2024: €0.2/MWh

Source: Terna calculation on GME data

The spread between the peak and off-peak prices in May 2024 was, on average, -€15/MWh. The highest spread was recorded in the North zone where it was -€8/MWh.

Day Ahead Market – PUN and zonal prices [€/MWh]

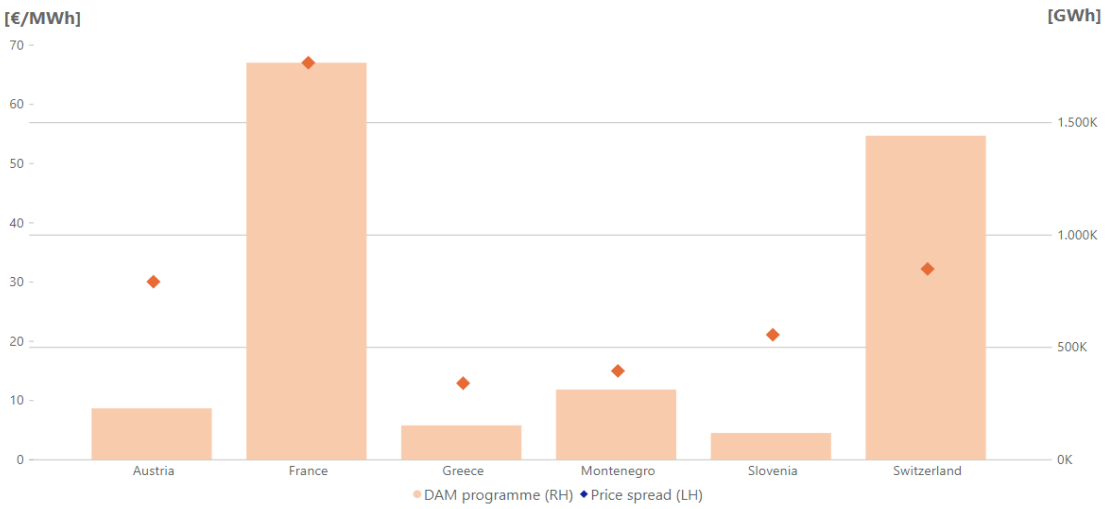
	PUN	Calabria	Centre-North	CSouth	North	Sardinia	Sicily	South
Average	94.9	94.0	95.5	95.6	94.2	91.6	100.5	94.0
Average Month Y-1	105.7	102.3	105.6	105.6	105.5	104.3	108.8	105.6
Δ vs PUN	-	-0.9	0.6	0.8	-0.7	-3.3	5.6	-0.9
Δ vs PUN Y-1	-	-3.4	-0.2	-0.1	-0.2	-1.4	3.1	-0.1
Maximum	164.9	180.0	158.0	180.0	158.0	180.0	228.2	180.0
Minimum	2.1	0.0	2.1	2.1	2.1	0.0	0.0	0.0
Peak	89.4	85.7	90.3	89.0	90.2	81.0	89.8	85.7
Off Peak	100.3	102.3	100.7	102.3	98.1	102.3	111.3	102.3
Δ Peak vs Off Peak	-10.9	-16.6	-10.4	-13.2	-7.9	-21.2	-21.5	-16.6

Source: Terna calculation on GME data

Peak-off peak spread down compared to the previous month and negative due to lowering of prices during hours in the middle of the day

The price spreads with France and Switzerland were €67/MWh and €32.2/MWh respectively (+0.1% and +0.3% compared to the previous month).
Imports totalled 4.2 TWh, +7.8% compared to the previous month, with France and Switzerland accounting for 35% and 42% of the total respectively. Total exports were 0.2 TWh, with Slovenia accounting for 38% and Greece 20%.

Price spread with foreign exchanges and day ahead programmes



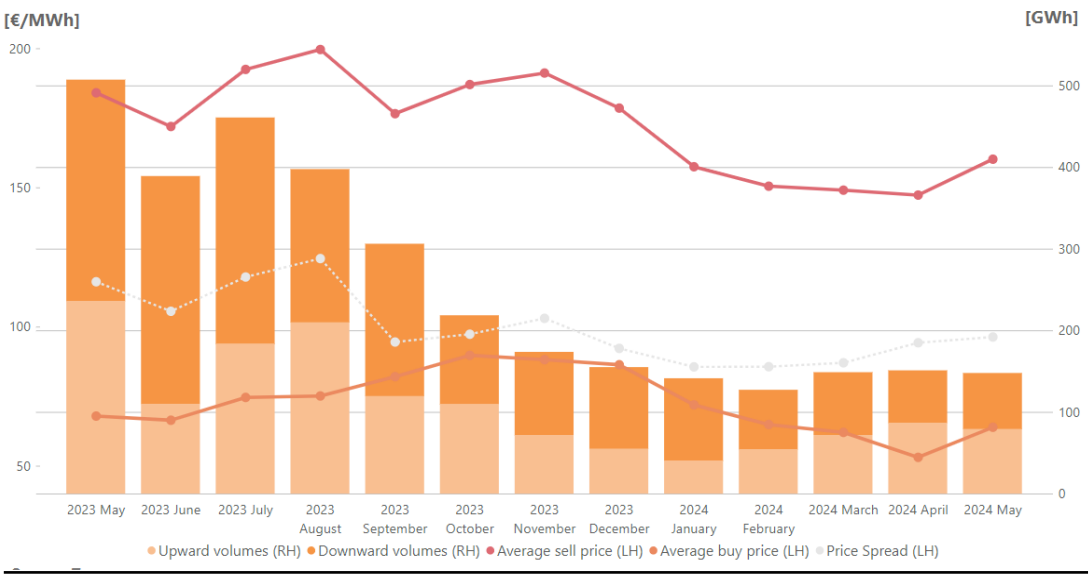
Source: Terna calculation

Net imports on the northern border of 3.6 TWh.

Ex-ante Ancillary Services Market

In May 2024, the spread between bid-up and bid-down prices was €96/MWh (+2% compared to the previous month and -17% compared to May 2023).
Total volumes decreased compared to the previous month (-2%). Specifically, upward volumes decreased by 9% while downward volumes increased by 7%.
Upward volumes fell by 66%, while downward volumes fell by 75% compared to the same month of the previous year.

Ex-ante Ancillary Services - prices and volumes

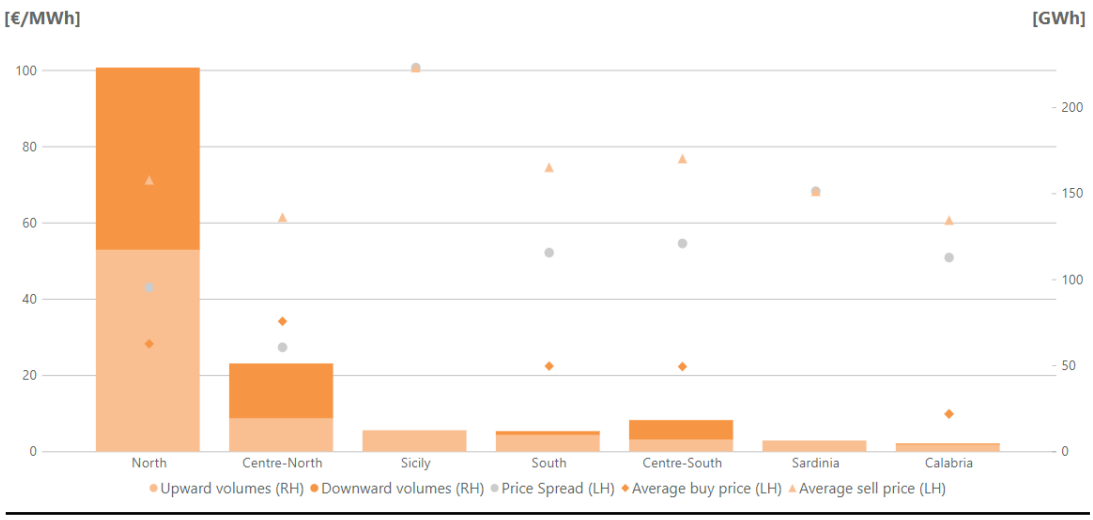


Source: Terna

Average bid-up price in May 2024 of €160/MWh. Average bid-down price in May 2024 of €64/MWh.

The market zone characterised by the highest spread (€223/MWh) is Sicily.
This spread recorded a difference of 48% compared to the previous month.
The average bid-up price went from €147/MWh in April to €160/MWh in May; the average bid-down price went from €53/MWh in April to €64/MWh in May.

Ex-ante Ancillary Services - prices and volumes by market zone



Source: Terna

Sicily: zone with the highest price spread

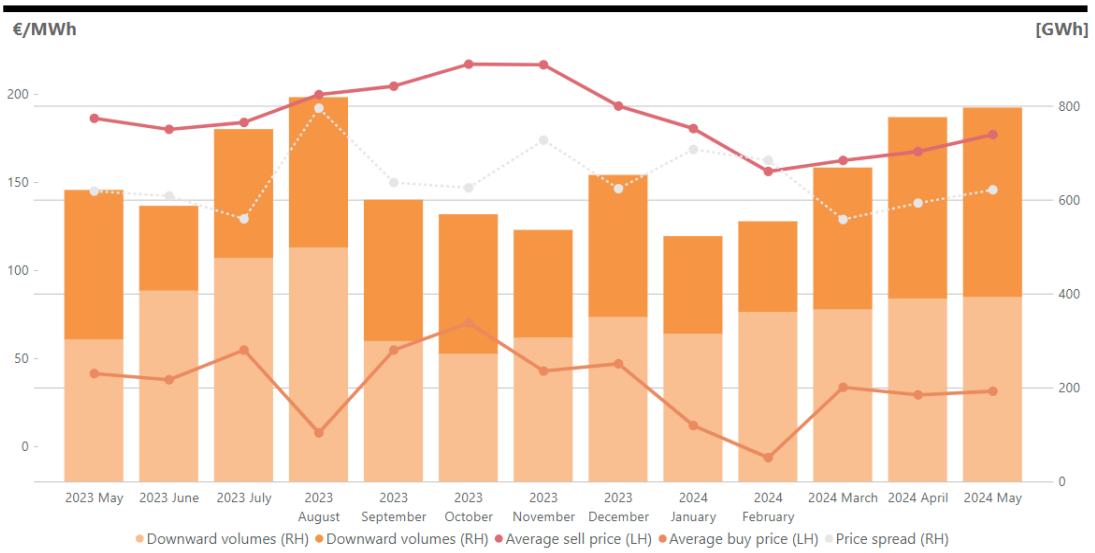
North: zone with the largest volumes moved

The ex ante MSD prices include the transactions on the TERRE platform

Balancing Market

In May 2024, the spread between bid-up and bid-down prices was 146 €/MWh (+5% compared to the previous month and +1% compared to May 2023).
Total volumes increased compared to the previous month (+3%). Specifically, upward volumes increased by 1% while downward volumes increased by 5%.
Upward volumes increased by 30%, while downward volumes increased by 27% compared to the same month of the previous year.

Balancing market – prices and volumes

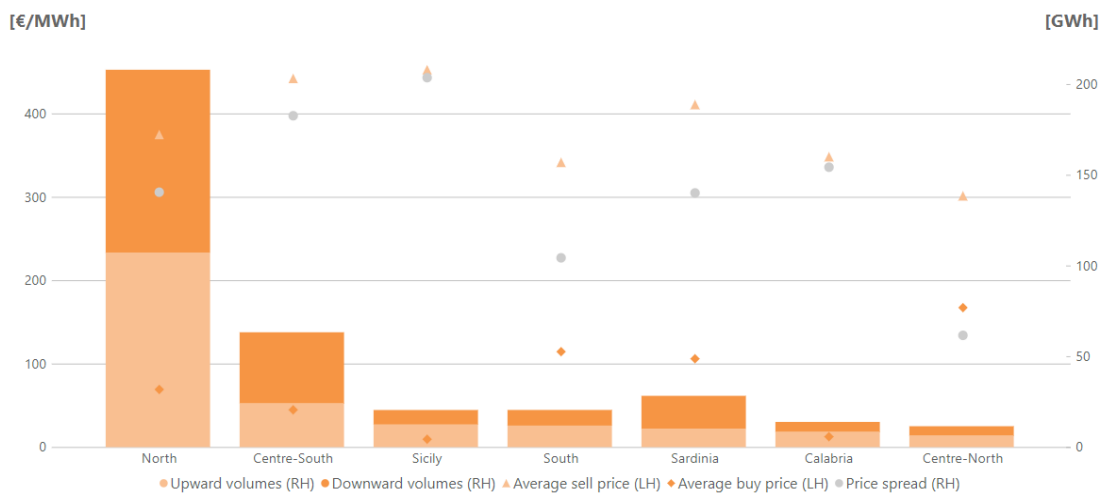


Source: Terna

Average bid-up price in May 2024 of €177/MWh. Average bid-down price in May 2024 of €31/MWh.

The market zone characterised by the highest spread (€204/MWh) is Sicily.
This spread recorded a difference of 2% compared to the previous month.
The average bid-up price went from €167/MWh in April to €177/MWh in May; the average bid-down price went from €29/MWh in April to €31/MWh in May.

Balancing market – prices and volumes by market zone



Source: Terna

Sicily: zone with the highest price spread

North: zone with the largest volumes moved

Since 19 July 2023 (project launch date) to 15 March 2024 (suspension of participation in project), the MB volumes also include the transactions on the PICASSO platform

Commodities – Spot Market

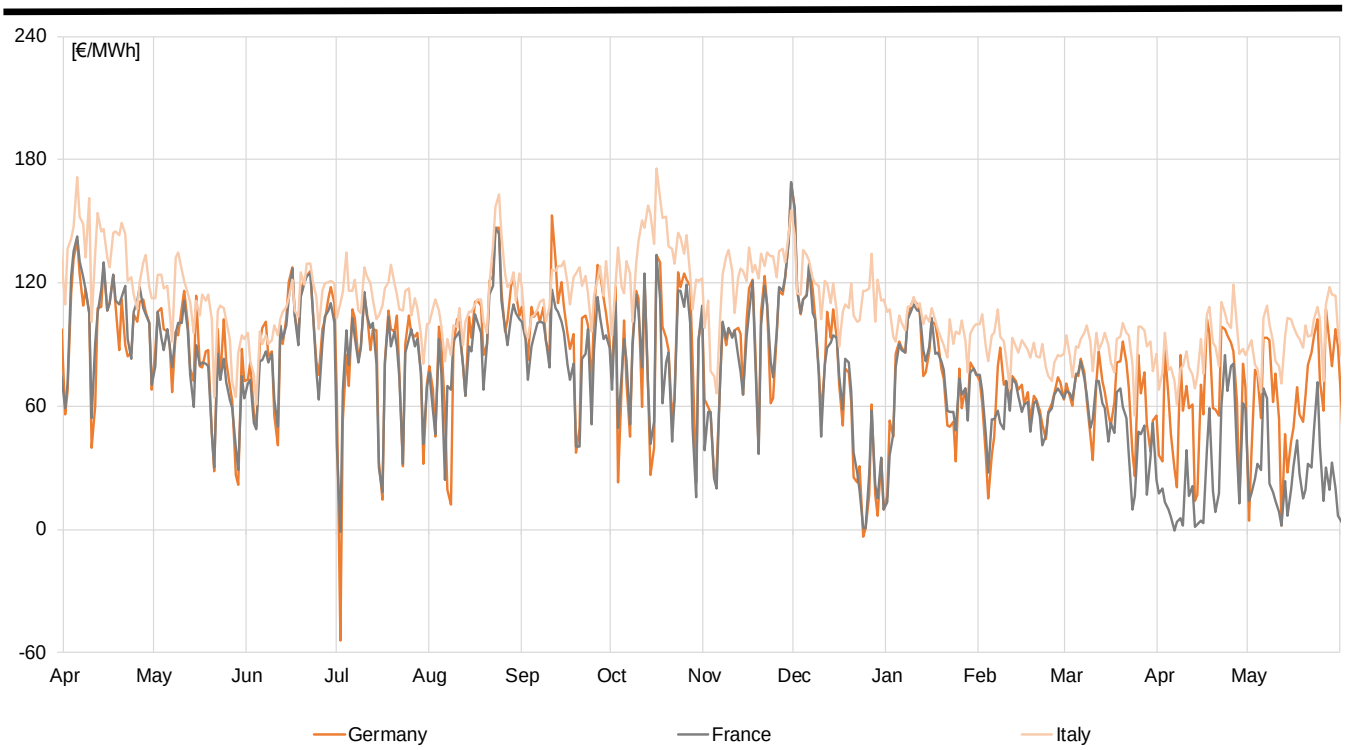
In May, Brent prices recorded an average value of $82.3/bbl, down compared to April (-8.8%).

The average coal prices (API2) were down compared to April, settling at around $106.1/t (-10.5%).

European gas prices (TTF) in May fell compared to April, with a monthly average of €31.5/MWh (+8.6% compared to the previous month); the PSV recorded an increase, settling at €33.3/MWh (+7.8%).

Electricity prices in Italy rose in May compared to the previous month, with a monthly average of €94.9/MWh (+9.3%). The French power exchange was down, with the price of electricity at €27.2/MWh (-3.8%), whilst the German exchange increased, with a price of €67.2/MWh (+7.8%).

Spot electricity prices



Source: Terna calculation on GME and EPEX data

Gas & Oil spot prices

Monthly average change PSV-TTF = +1.8/MWh

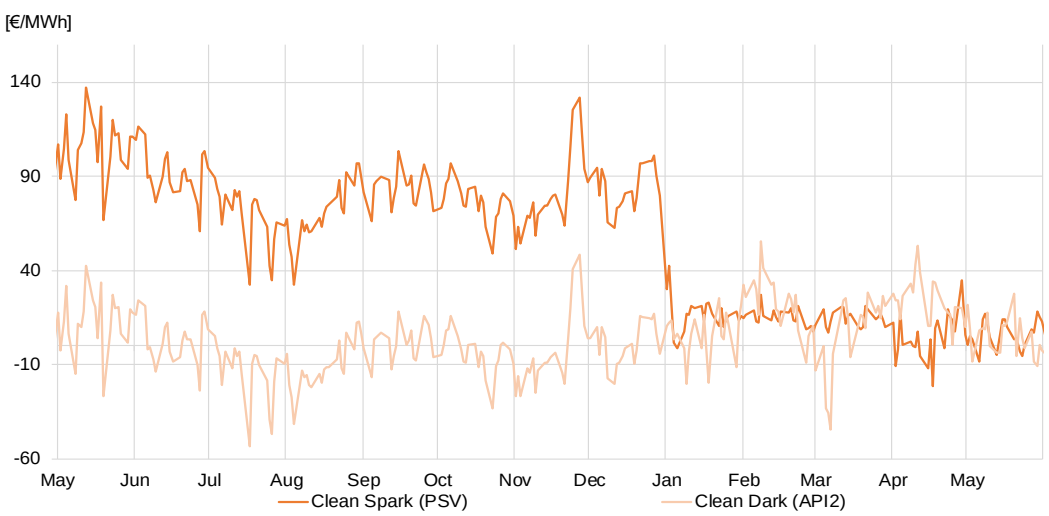
Source: Terna calculation on Bloomberg data

Coal & Carbon spot prices

Monthly average change API2-API4 = -$0.5/t

Source: Terna calculation on Bloomberg data

Clean Dark & Spark spreads Italy



Clean spark spread PSV monthly average = +€6.6/MWh

Clean dark spread API2 monthly average = -€3.5/MWh

Source: Terna calculation on Bloomberg data

Commodities – Forward Market

In May, Brent forward prices recorded an average value of $76.3/bbl, down compared to April (-2.5%).

The average forward prices of coal (API2) were up compared to April, settling at around $118.0/t (-1.3%).

Forward prices of gas in Europe (TTF) were up compared to the previous month (+9.3%), settling at around €36.4/MWh. Forward prices in Italy (PSV) were also up, which showed an average figure of €37.6/MWh (+8.4%).

The average forward prices of electricity in Italy stood at around €108.3/MWh, up compared to the previous month (+14.8%). The French power exchange was down, where the price stood at around €83.9/MWh (+5.4%), as was the German power exchange, where the price was €95.2/MWh (+9.6%).

Forward Electricity Prices – Year+1

Source: Terna calculation on Bloomberg data

Year+1 Forward Gas & Oil Prices

Monthly average change PSV-TTF = +€1.4/MWh

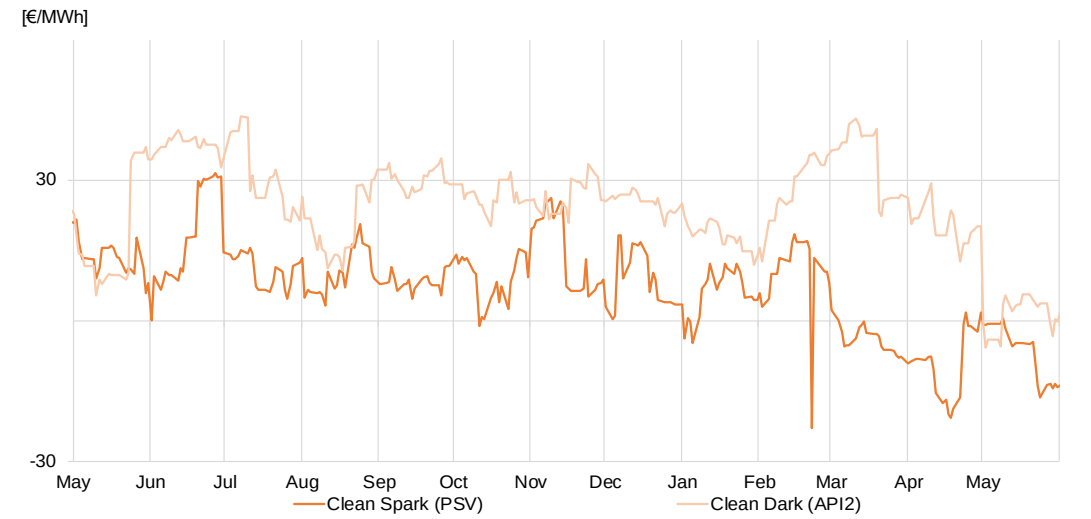
Source: Terna calculation on Bloomberg data

Year+1 Forward Coal & Carbon Prices

Monthly average change API2-API4 = +$1.6/t

Source: Terna calculation on Bloomberg data

Clean Year+1 Forward Dark & Spark spreads Italy



Clean spark spread PSV monthly average = -€6.5/MWh

Clean dark spread API2 monthly average = +€1.7/MWh

Source: Terna calculation on Bloomberg data

Key

API2 – CIF ARA: the reference index for the coal price (with PCI of 6,000 kcal/kg) imported from north-west Europe. It is determined on the basis of an assessment on the CIF (Cost, Insurance and Freight) prices of coal contracts, with delivery to the ports of Amsterdam – Rotterdam – Antwerp (ARA).

API4 – FOB Richard Bay: the reference index for the coal price (with PCI of 6,000 kcal/kg) exported from Richards Bay in South Africa. It is calculated on the basis of an assessment on the FOB (Free On Board) prices of contracts excluding transport starting from the port of Richards Bay.

Territorial Areas: these consist of one or more adjacent regions and are aggregated as indicated:

TURIN: Piedmont - Liguria - Valle d'Aosta;
MILAN: Lombardy (*);
VENICE: Friuli Venezia Giulia - Veneto - Trentino Alto Adige;
FLORENCE: Emilia Romagna (*) - Tuscany;
ROME: Lazio - Umbria - Abruzzo - Molise - Marche;
NAPLES: Campania - Apulia - Basilicata - Calabria;
PALERMO: Sicily;
CAGLIARI: Sardinia;

(*) In these two regions, the geographical borders do not correspond to the electrical borders. Lombardy includes production plants that are part of the geographical administrative territory of Emilia Romagna.

The data related to the reservoirs table of tanks are **aggregated by ZONE** as indicated:

NORTH - includes the Territorial Areas TURIN, MILAN and VENICE;
CENTRE and SOUTH – includes the Territorial Areas FLORENCE, ROME and NAPLES;
ISLANDS – includes the Territorial Areas PALERMO and CAGLIARI;

Brent: the oil price as global reference for the crude oil market. Brent Crude is the result of a mixture deriving from the union of different types of oil extracted from the North Sea.

Clean Dark Spread: the difference between the price of electricity and the cost of the fuel of a coal power station and the cost of the CO_2 emission quotas.

Clean Spark Spread: the difference between the price of electricity and the cost of the fuel of a gas power station and the cost of the CO_2 emission quotas.

Dirty Dark Spread: the difference between the price of electricity and the cost of the fuel of a coal power station.

Dirty Spark Spread: the difference between the price of electricity and the cost of the fuel of a gas power station.

Day-Ahead Market (DAM): the trading venue of offers to buy and sell electricity for each relevant period of the day after that of trading.

Balancing Market (MB): the set of activities performed by the Operator for selecting the offers presented on the Dispatching Services Market to resolve the congestions and establish secondary and tertiary reserve power margins, carried out on the same day as that to which the offers refer.

Dispatching Services Market (MSD): the trading venue of the resources for the dispatching service.

Dispatching Services Market - planning stage (Ex-ante Ancillary Services Market): the set of activities performed by the Operator for selecting the offers presented on the Dispatching Services Market to resolve the congestions and establish secondary and tertiary reserve power margins, carried out in advance with respect to real time.

M-o-M - Month on Month: percentage change of the difference between the reference month and the previous month.

NET TRANSFER CAPACITY - NTC: the maximum transfer capacity of the grid for interconnection with other countries. NTC D-2 indicates the same capacity defined in day D-2.

Peak hours: these, according to the agreement with the electricity market operator (Gestore del Mercato Elettrico - GME), are the hours between 8:00 and 20:00 of working days only. **Off-peak hours** are all hours that are outside of peak hours.

CO_2 Price: determined by the European Union Emissions Trading Scheme (EU ETS), a system for the trading of greenhouse gas emission quotas in Europe aimed at reducing emissions.

Single National Price - PUN: the Single National Price calculated as a result of the Day-Ahead Market (DAM).

DAM Zonal Price: the balanced price of each zone calculated as a result of the Day-Ahead Market (DAM).

PSV - Punto Scambio Virtuale: the price at the virtual exchange point for the buying and selling of natural gas in Italy.

TTF - Title Transfer Facility: the price at the virtual exchange point for the buying and selling of natural gas in the Netherlands.

Y-o-Y – Year on Year: percentage change of the difference between the period of the current year and the same period of the previous year

IMCEI - Monthly Industrial Electrical Consumption Index: the monthly IMCEI was constructed based on the size of the monthly withdrawals of the approximately 1,000 customers directly connected to the high voltage grid and for which Terna is responsible. These customers have been reclassified pursuant to the Ateco2007 Codes and aggregated by electrically relevant product class. The adimensional index has been created taking 2015 as a basis 100.

IMSER - Monthly index of electricity consumption for the services sector. The IMSER index (Monthly Services Index) is produced according to the supply of electricity consumption in the Services sector for five Distributors - E-Distribuzione, UNARETI, A-Reti, Edyna and Deval. These consumption data are given according to the Ateco2007 codes and are aggregated by commodity class. The index has a fixed basis (2019=100) and represents around 80% of the electricity consumption in the Services sector with a time lag of two months.

Effect of change in installed power and effect of producibility on solar and wind production: The change in photovoltaic or wind production in a given period can be attributed to two factors: a change in capacity ("Effect of change in installed power") and a change in producibility hours ("Effect of producibility") linked to solar irradiation or amount of wind. To determine these two components of production in a given period of the year Y compared to the same period of the year Y-1, equivalent hours of use are considered (HU). The HU figure is calculated as the ratio between energy produced and installed capacity operational as resulting in the period Y-1. To calculate the effect of the change in installed power (in energy) the HU figure for the period Y-1 is multiplied by the change in capacity between the same periods of year Y and year Y-1. The producibility effect is calculated as the difference between the change in total energy and the effect of the change in installed power.

Disclaimer

1. The 2023 and 2024 monthly electricity balances are provisional.
2. More specifically, the monthly electricity reports for 2024 – prepared at the end of each month – are subject to further, more accurate verification or recalculation in the following months based on additional information. This operation to refine the monthly figures translates into a higher degree of precision compared to the sum of the data processed in the single Monthly Reports published on the website www.terna.it.