

Monthly Energy Bulletin

TSKB Economic Research

December 2023 #67

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COP 28 summit concluded

The 28th Conference of the Parties to the United Nations Framework Convention (COP 28) summit was held in Dubai, United Arab Emirates, between 30 November and 12 December. For the first time, the agreed conclusion text made reference to the term “fossil fuels”. In the text, the goal of moving away from fossil-based energy systems in a fair, systematic and equitable manner by accelerating actions by 2030 in order to reach net zero by 2050 was determined. The text also included a pledge to triple global renewable energy capacity and double the improvement in energy efficiency by 2030, while an article was added to accelerate the significant reduction in non-carbon dioxide emissions, especially methane. However, the highlighted issue was to phase out subsidies of inefficient fossil fuels as soon as possible. The items included phasing out coal power plants, accelerating investments in renewable and nuclear power, accelerating development of zero-emission and low-emission technologies, including low-carbon hydrogen production, as well as technologies such as carbon capture, utilization and storage, primarily in sectors where emissions are difficult to reduce.

In addition to these decisions, over USD 700 million was committed to the loss and damage fund at the COP 28, and the First Situation Assessment text was accepted. A total of 37 countries are participating in the Climate Club. Agreements such as the Declaration on Sustainable Agriculture, Resilient Food Systems and Climate Action, the Hydrogen Declaration and the Health Declaration were signed.

27.81 TWh	2,075.0 TL/MWh
December Gross Generation	Average MCP

4.8%

Daily average licensed electricity generation increased by 4.6% MoM and 4.8% YoY in December.

[Click](#) for details.

-44.4%

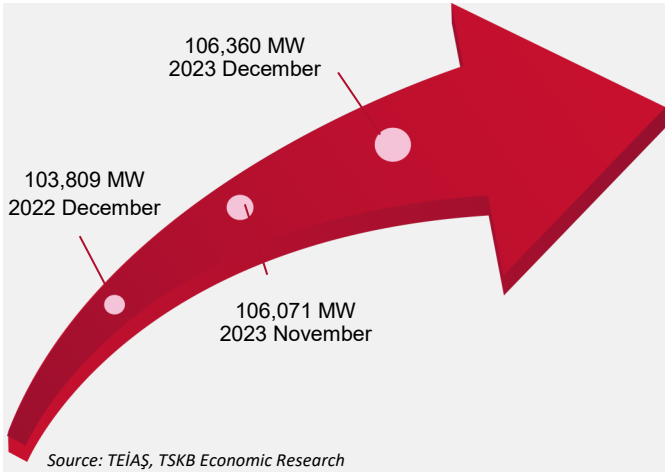
Market Clearing Price (MCP) increased by 0.3% MoM with a decline of 44.4% YoY in December.

[Click](#) for details.



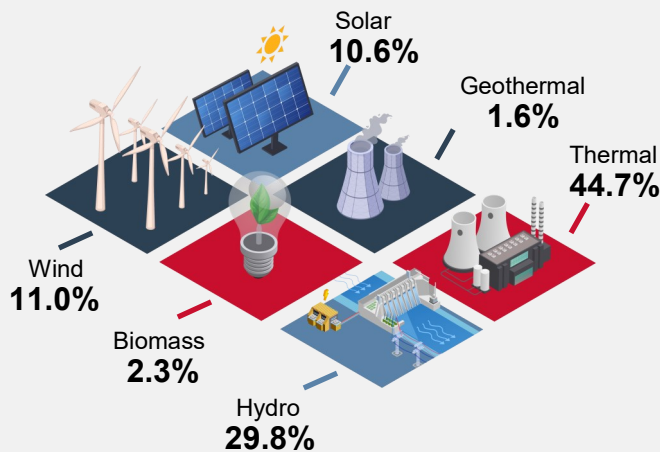
Installed Capacity Analysis

Türkiye's total installed capacity, which stood at 103,809 MW at the end of December 2022, reached 106,360 MW by the end of 2023. A total 288.9 MW in net installed capacity was commissioned in December, with hydroelectric power plants accounting for 182.9 MW of this total. In the same period, there was an increase of 54.0 MW in wind power plants, 40.4 MW in solar power plants and 9.6 MW in renewable waste energy plants. The capacity of power plants generating electricity from natural gas and multi-fuels increased by 2.0 MW.



55.4% of the capacity in operation in December consisted of power plants generating electricity from renewable resources. Thus, the rate of renewable resources continued to increase and remain above the 55% level. While hydroelectric power plants account for 29.8% of Türkiye's total electricity installed power, wind and solar power plants accounted for 21.6% of Türkiye's total installed capacity.

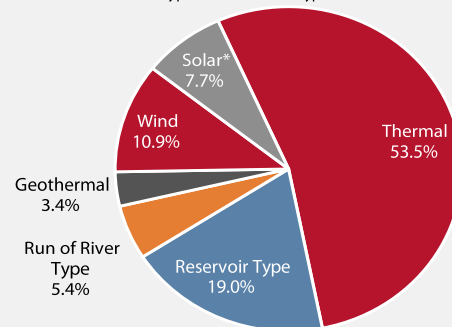
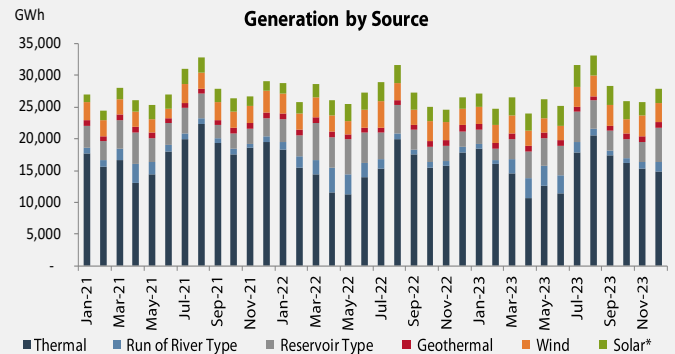
December 2023 Installed Capacity Breakdown



Source: TEİAŞ, TSKB Economic Research

Generation-Consumption Analysis

Total electricity generation increased from 25.7 terawatt-hours (TWh) in November to 27.8 TWh in December. However, it is seen that the average daily electricity production for December increased by 4.8% compared to the same period of the previous year and 4.6% compared to the previous month.

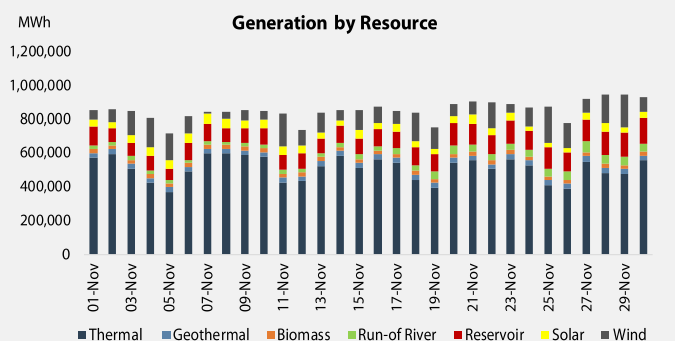


*Since December unlicensed solar power plant generation data has not yet been released by TEİAŞ, the average daily electricity generation by unlicensed solar power plants in December was accepted as same as the average daily electricity generation of November.

Source: TEİAŞ, YTBS Daily Reports, TSKB Economic Research

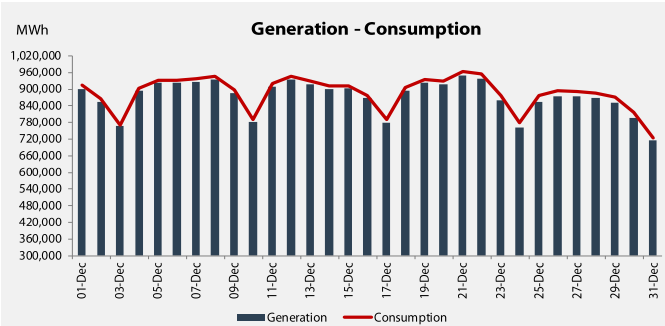
Thermal power plants, which generated 59.5% of the electricity produced in November, generated 3.5% of the total electricity in December. An examination of the source-based breakdown of power plants finds that hydroelectric power plants, which had a share of 16.2% in the previous month, generated 24.4% of the total electricity in December. In the same period, the share of electricity generated from wind decreased by 1.9 percentage points compared to the previous month, to 10.9%. Geothermal power plants accounted for 3.4% of the total electricity generated.

The share of renewable energy power plants in electricity generation, having averaged 42.7% in 2022, stood at 46.5% in December 2023. During the relevant period, dam-type hydroelectric power plants contributed 19.0% to the total generation, while river-type hydroelectric power plants met 5.4% of the total generation, with wind and solar power plants accounting for 18.6% of total electricity generation; wind was the second largest source of renewable electricity generation after dam-type hydroelectric power plants, with a share of 10.9%.



Source: TEİAŞ, YTBS Daily Reports, TSKB Economic Research





Source: TEİAŞ, YTBS Daily Reports, TSKB Economic Research

In December, licensed power plants generated an average of 873,985 MWh of electricity, with the highest generation recorded on Thursday, December 21 at 950,131 MWh and the lowest on Sunday, December 31, at 715,030 MWh.

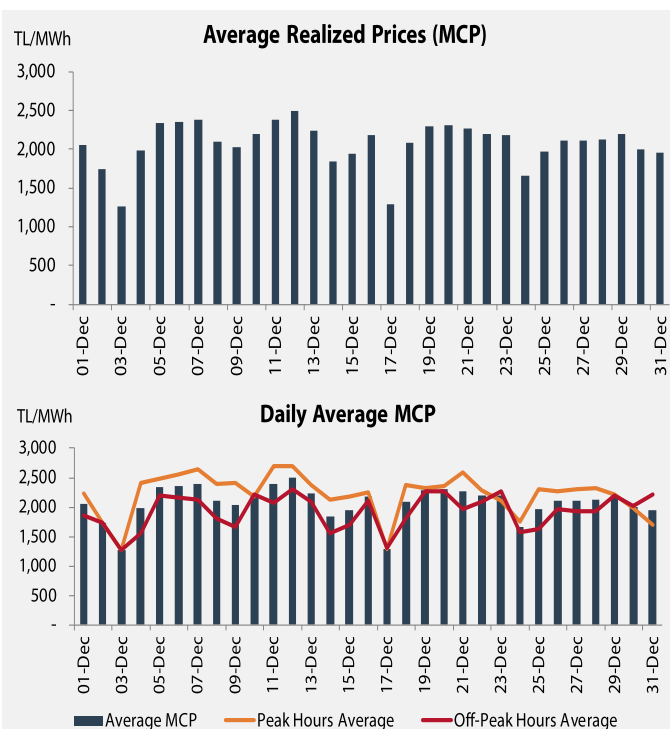
During the same period, electricity consumption averaged 886,937 MWh per day. The highest consumption during the month was recorded on Thursday, December 21, at 963,340 MWh, with the lowest consumption recorded on Sunday, December 31, at 725,307 MWh.

Electricity Price Analysis

In December, the daily average market clearing price (MCP) was between TL 1,250.0 /MWh and TL 2,550.0 /MWh. The MCP averaged TL 2,075.0 /MWh in December. The highest daily average MCP was recorded on Tuesday, December 12, at TL 2,500.5 /MWh, with the lowest daily average MCP recorded on Sunday, December 3, at TL 1,268.9 /MWh.

An examination of the hourly data finds that December's MCP reached its maximum limit at TL 2,700.0 /MWh for a total of 78 hours, and its minimum of TL 250.0 /MWh between 12PM and 1PM on Sunday, December 3.

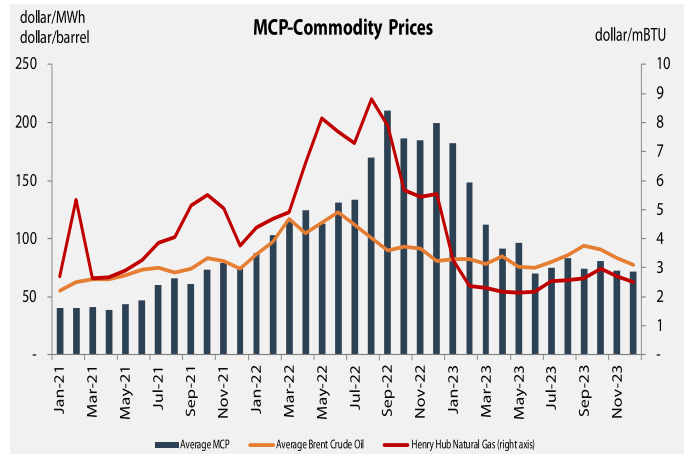
An analysis of the average MCP for December finds that the average for peak hours (between 8AM and 8PM) was 7.0% above the average for all hours, to be recorded at TL 2,220.3 /MWh. The maximum limit of TL2,700.0 /MWh was recorded for 74 hours during peak hours with the lowest price of TL 250.0 /MWh recorded for one hour during peak hours.



Source: EXIST, TSKB Economic Research

In the same period, the average off-peak hours rate (between 8PM-8AM) was TL1,929.7 /MWh while the maximum limit price of TL2,700.0 /MWh was realized for four hours during off-peak hours with the lowest price of TL 899.0 /MWh during off-peak hours recorded between 11PM-12AM on Thursday, December 14.

The MCP averaged USD 72.2 /MWh in November with the average MCP decreasing to USD 71.4 /MWh in December. The MCP was down by 64.2% in dollar terms when compared to the same period of the previous year.



Source: EPİAŞ, TCMB, EIA, TSKB Economic Research

Average Commodity Prices

Brent crude oil prices, which averaged USD 82.90 /bbl in November, decreased 6.6% on a monthly basis to USD 77.50 /bbl in December. This average price was 4.2% lower than in the same period of the previous year.

The Henry Hub natural gas contract price, which averaged USD 2.71 /mbtu in November, decreased by 7.1% on a monthly basis to USD 2.52/mbtu. This represents a decrease of 54.5% compared to the same period of the previous year .





Sector News

Local News

- Final Renewable Energy Source List for 2024 published.

According to the list, 779 licensed power plants will be able to benefit from the Renewable Energy Resources Support Mechanism (YEKDEM) in 2024. Of the power plants with a total installed capacity of 17.63 gigawatts (GW) included in the YEKDEM, hydroelectric power plants accounted for 6.77 GW and wind farms accounted for 6.75 GW, followed by biomass plants (2.19 GW), geothermal power plants (1.45 GW) and solar power plants (0.47 GW). The total installed power of the power plants that will benefit from YEKDEM in 2023 was around 20 GW. (December 29, 2023)

- International Energy Agency (IEA) Executive Director Fatih Birol highlights the importance of nuclear power for Türkiye.

In his evaluation, the Executive Director of IEA stated that he had been highlighting the importance of nuclear power for Türkiye for the last 20 years, adding that there could be cooperation between France and Türkiye in this area. Adding that Türkiye, which is very considerable renewable energy potential, also offers very high potential in the field of geothermal and bioenergy, Mr. Birol cited that Türkiye and France could also benefit from each other in the field of energy efficiency. Pointing out that there has been a significant transformation in the transportation sector, Fatih Birol stated that the IEA predicts that one in every two vehicles sold in the very short term will be electric. (December 14, 2023)

- **Necessary permit received for first reactor of Akkuyu Nuclear Power Plant to enter operation.** According to the statement issued by Akkuyu Nükleer A.Ş., the first of the application documents required for the permit was submitted to the

Nuclear Regulatory Authority on March 17 and the second on August 24. With this permit, the start-up, adjustment and operation processes, which represent the final phase of the construction of the Akkuyu Nuclear Power Plant and which form the basis for the safe operation of the plant can get underway, which will mark the completion of the work to obtain the necessary license to operate the first power unit. (December 13, 2023)

- Memorandum of understanding in the field of energy approved between Türkiye and Saudi Arabia.

According to the memorandum of understanding published in the Official Gazette, the two countries will explore opportunities for cooperation in the fields of renewable energy and energy efficiency, electricity, hydrogen, the circular carbon economy, hydrocarbons, battery storage, digital transformation in the field of energy and the energy supply chain. The relevant memorandum of understanding was signed on July 17, 2023. (December 13, 2023)

- **TSKB publishes "Energy Outlook 2023" report.** In addition to evaluations of energy sub-sectors, the report covers the subjects of energy efficiency and climate. Highlighting that Türkiye had the feature of being a lever in low-carbon energy transformation with its renewable energy potential, the report points out the importance of integrating renewable energy resources into the electricity system. (December 12, 2023)

- Türkiye's solar energy capacity could increase by 120 GW through rooftop installations.

According to a study conducted by Ember, Türkiye's rooftop solar energy potential is close to 10 times the current solar energy capacity. The study indicated that the top three provinces in terms of total rooftop

solar energy potential were Istanbul (10.4 GW), Ankara (10.1 GW) and Izmir (9.3 GW). According to the study, up to 120 GW of electricity could be generated from this capacity, corresponding to 45% of Türkiye's electricity consumption in 2022. (December 12, 2023)

- World Bank prepares program together with the government to support solar energy projects with storage. With the prepared Result Oriented Program (PforR) project, the expansion of Türkiye's distributed solar photovoltaic market and the pilot implementation of distributed battery electricity storage systems will be supported and contribute to the implementation of the National Energy Plan. The Main Program Implementing Institutions include the Industrial Development Bank of Türkiye (TSKB), the Development and Investment Bank of Türkiye (TKYB), the Ministry of Energy and Natural Resources and the Energy Market Regulatory Authority. (7 December 2023)

- World Bank announces preparations for a new financing operation that could reach USD 750 million in the field of electricity transmission in Türkiye. The World Bank Director for Türkiye, Humberto Lopez, stated that Türkiye had prepared a plan that would help decarbonize energy production and emphasized that it would significantly increase the country's installed renewable energy capacity. Pointing out that the plan would cost approximately USD 100 billion over 12 years, Lopez stated that the plan was expected to require USD 60-75 billion of investment in production, USD 10 billion in transmission and USD 8-10 billion in distribution. The director added that the World Bank had started preparations for a new financing operation in the field of electricity transmission that could reach USD 750 million. (5 December 2023)

Foreign News

- Russia expects natural gas center to be established in Türkiye in 2024. Russian Deputy Prime Minister Aleksandr Novak stated that the road map for the project to establish a natural gas center in Türkiye will be approved shortly, and it was hoped that the project would be implemented in 2024. (December 28, 2023)

- Europe unlikely to enter any energy agreement with Russia again, according to Executive Director of IEA, Fatih Birol. IEA Executive Director suggested that if there no problems in nuclear and hydroelectric power plants in Europe during a normal winter, Europe would not have a problem with natural gas this winter either. Stating that the shortfall of natural gas which would normally have been purchased from Russia had been met through imports of liquefied natural gas (LNG) from countries such as the USA and Qatar, the Executive Director pointed out that the additional LNG capacity that will come from the USA and Qatar in four or five years will be half as much as the current capacity. Drawing attention to the nuclear transformation in the last year and a half, Fatih Birol stated that countries are building new nuclear power plants with existing technologies. (December 23, 2023)

- Critical mineral supply chains need to be sustainable and responsible to be safe, reliable and resilient. According to the "Sustainable and Responsible Critical Mineral Supply Chains" report published by IEA, the increasing demand for critical minerals during the clean energy transition will require the establishment of new mines, processing plants and refineries, and this increase may also raise the risk of harm to the environment, workers and society. In this context, growth in the

critical mineral market may lead to new investment, tax revenue and employment. The report highlights the need for laws and regulations which protect the environment, society and people, and points out the importance of establishing international sustainability standards. In addition, the report points to six important issues in terms of supply security and lists these issues as water, greenhouse gas emissions, biodiversity, human rights, society and corruption. (December 19, 2023)

- IEA publishes its "Oil Market Report". In its report, IEA reduced its forecast for global oil demand growth for 2023 by 90,000 barrels/day to 2.3 million barrels /day, while the forecast for growth in global oil demand for 2024 was raised by 130,000 barrels/day to 1.1 million barrels /day. IEA projects global demand of 101.7 million barrels /day in 2023 and 102.8 million barrels/day in 2024. (December 15, 2023)

- Carbon dioxide emissions from fossil fuels expected to reach record levels in 2023. According to research published by the Global Carbon Project, while the rise in emissions has slowed down significantly in the past decade, emissions continue to increase, and it is predicted that there will be a 1.1% increase in fossil fuel emissions in 2023 compared to 2022. Researchers reveal that if fossil fuel-based emissions remain at their current level, the carbon budget to keep global warming to within 1.5°C will be spent within 7 years. The report reveals that the US and the EU, the largest historical polluters, reduced their emissions in 2023, but India and China, the world's first and third polluters today, increased their emissions. (5 December 2023)

Brazil to join the Organization of the Petroleum Exporting Countries and Allies (OPEC+) alliance. In a written statement issued by OPEC, Brazil will be included in the OPEC+ group alliance with effect from January 2024. (1 December 2023)





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