

Monthly Energy Bulletin

TSKB Economic Research

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Akkuyu Nuclear Power Plant still under construction

After nuclear fuel arrived at Akkuyu Nuclear Power Plant, the plant was granted "nuclear facility" status. All reactors are planned to gradually enter operation until 2028. President Recep Tayyip Erdoğan gave a speech in the fuel acquisition ceremony, stating that the Akkuyu Nuclear Power Plant would meet 10% of Türkiye's electricity consumption and that the reactors would generate around 35 billion kilowatthours of electricity once they reach their full capacity. The Akkuyu Nuclear Power Plant is expected to reduce natural gas exports by USD 1.5 billion per year is expected to prevent 2.1 billion tonnes of carbon emissions in total over the course of its 60-year operation.

According to the "Regulation Amending the Regulation on the Equipment Procurement Process for Nuclear Reactors and Manufacturer Approval" published by the Official Gazette a few days before the fuel acquisition ceremony, some provisions concerning the supply of the equipment to be used in nuclear power plants, the required permits for the supply process, the manufacturing notice, the manufacturing approval, the responsibilities of the party establishing the facility in the supply process, the supervision of the supply process and all provisions concerning sanctions related to these areas have been repealed.

In Europe, on the other hand, while nuclear power reactors in Germany are being decommissioned, Finland has started construction work on what will be the world's largest nuclear reactor. According to a statement from the German government, Germany's remaining three operating nuclear reactors will be decommissioned by April 15th. Since 2003, a total of 16 reactors have been decommissioned. In Finland, the Olkiluoto Nuclear Reactor #3 with a capacity of 1,600 megawatts (MW) was commissioned on Monday, April 9th. The activation of this reaction now means that nuclear energy accounts for more than 50% of Finland's electricity. The new reactor will be capable of generating electricity for at least 60 years.

24.00
TWh

March Gross
Generation

1,770.8
TL/MWh

Average
MCP

-9.3%

Daily average licensed electricity generation decreased by 9.3% MoM and 8.0% YoY in April.

[Click](#) for details.

-3.3%

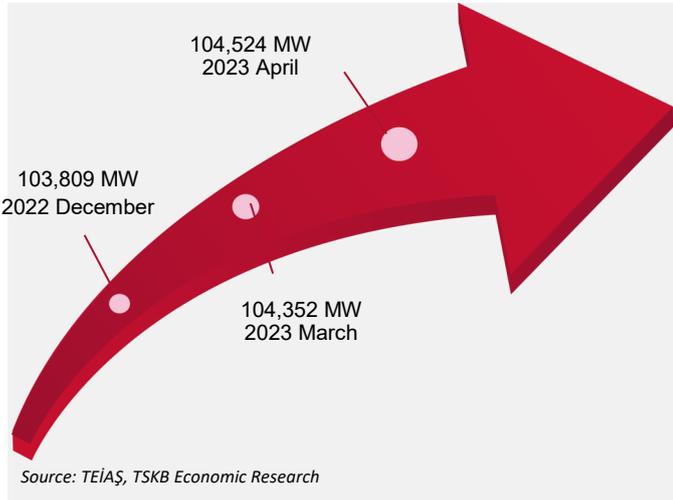
Market Clearing Price (MCP) decreased by 16.7% MoM and 3.3% YoY in April.

[Click](#) for details.

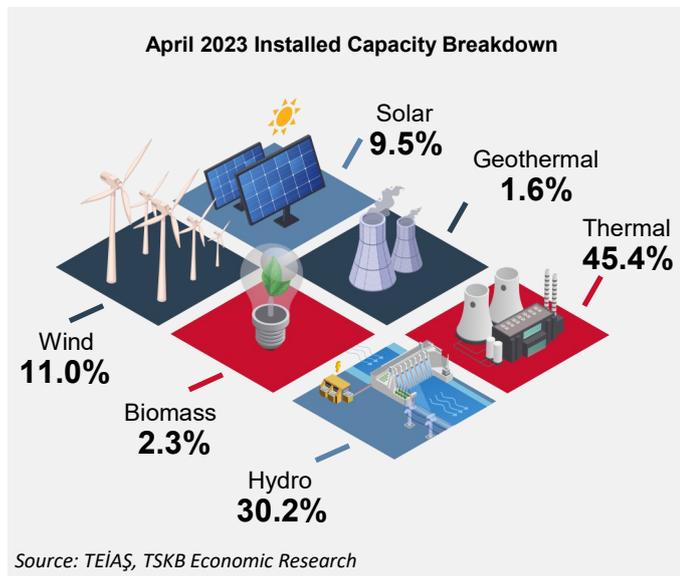


Installed Capacity Analysis

Türkiye's total installed generation capacity increased from 103.809 MW at the end of December 2022 to 104.542 MW at the end of April 2023. In April, a net total of 172.9 MW of installed generation capacity was commissioned, with solar energy power plants accounting for 110.7 MW of this amount. During the same time period, total net installed generation capacity of natural gas power plants declined by 46.8 MW, with wind farm capacity increasing by 51.5 MW and renewable waste energy power plant capacity increasing by 32.4 MW.

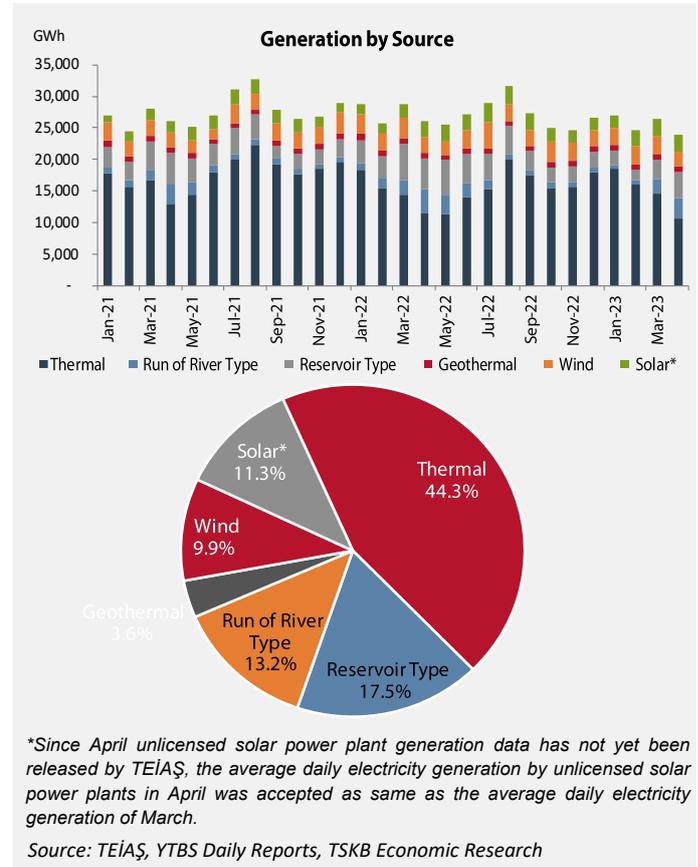


Renewable energy accounted for 54.6% of the total installed generation capacity in April, an increase from the previous month. Meanwhile, hydroelectric power plants accounted for 30.2% of total installed generation capacity in Türkiye, with wind and solar energy accounting for 20.5% of total installed generation.



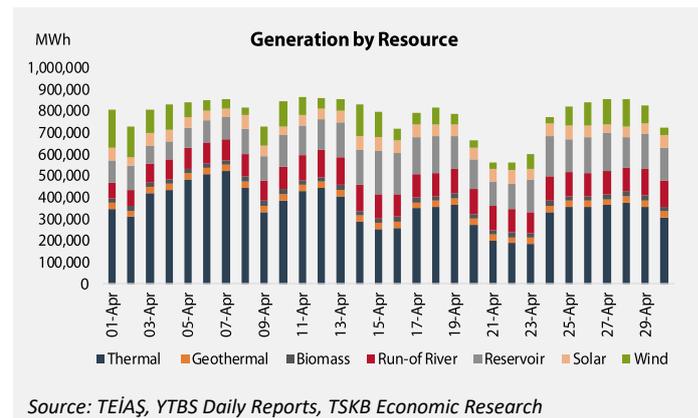
Generation-Consumption Analysis

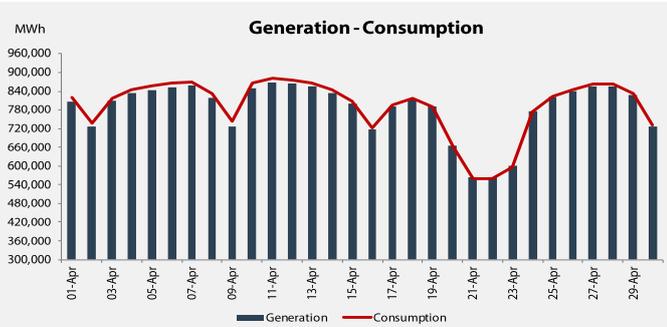
Total electricity generation declined from 26.5 terawatt-hours (TWh) in March to 24.0 TWh in the fourth month of the year. Daily average electricity consumption declined by 8.0% in April when compared to the same period of the previous year, and by 6.3% compared to the previous month.



Thermal power plants accounted for 44.3% of all of the electricity generated in April, down from their 55.2% share in March. A breakdown of generation by source finds that hydroelectric power plants generated 20.1% of all electricity during the previous year, with a 30.8% share in April, while wind farms generated 9.9% of the electricity generated in April, a decline of 0.7 percentage-points from the previous month. Geothermal power plants accounted for 3.6% of total electricity generation in Türkiye.

The average share of renewable energy in electricity generation, which had stood at 42.7% in 2022, accounted for a 55.7% share in April 2023. In the same period, dam-type hydroelectric power plants generated 17.5% of electricity, with river-type hydroelectric power plants accounting for a 13.2% share. The proportion of electricity generated by wind farms and solar power plants in the total was 21.2%.





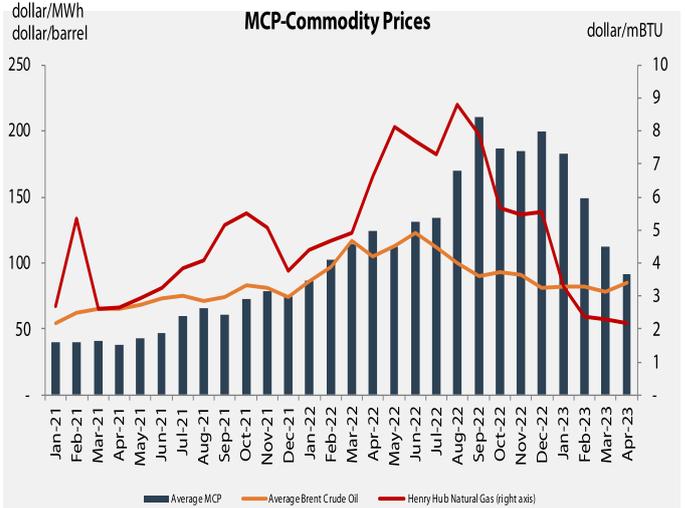
Source: TEİAŞ, YTBS Daily Reports, TSKB Economic Research

The daily average electricity generation from licensed power plants stood at 785,477 MWh in April. The maximum daily generation from licensed power plants during the month was 866,870 MWh on Tuesday, April 11th while the minimum daily generation was 718,506 MWh, recorded on Sunday, April 16th.

In the same time period, the daily electricity consumption averaged 792,225 MWh. The maximum consumption during the month was recorded on Tuesday, April 11th, at 882,961 MWh, while the minimum daily consumption, of 721,218 MWh was recorded on Sunday, April 16th.

In the same period, the average off-peak hours price (8PM-8AM) was TL 1,813.60 /MWh. The maximum price limit of TL 2,600 /MWh was recorded for 50 hours, while the minimum price was TL 10.01 /MWh, recorded on Sunday, April 23rd.

The average MCP declined from USD 111.9 /MWh in March to USD 91.60 /MWh in April, marking a 24.6% fall compared to the same period of the previous year.



Source: EPİAŞ, TCMB, EIA, TSKB Economic Research

Average Commodity Prices

The average price of a barrel of Brent crude oil increased by 7.9% on a monthly basis, from USD 78.43 in March to USD 84.64 in April, still 19.1% lower than in the same period of the previous year.

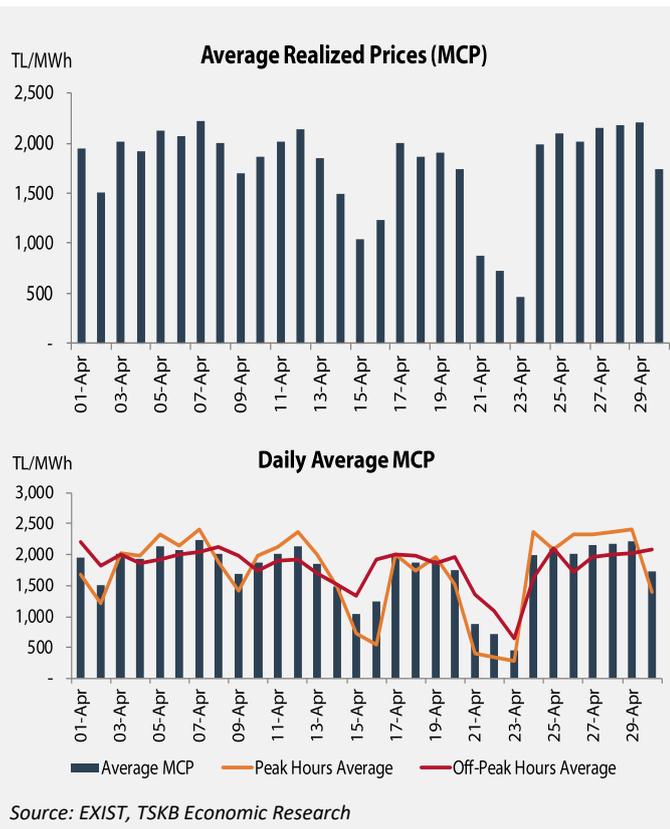
The average contract price for Henry Hub natural gas declined by 6.5% on the month from USD 2.31 /mBtu in March to USD 2.16 /mBtu in April. This represents a 67.3% decrease compared to the same time period of the previous year.

Electricity Price Analysis

The daily average market clearing price (MCP) varied between TL 460 and TL 2,230 per MWh, in April. The daily average MCP was TL 1,770.80 /MWh during the month with the maximum daily average MCP of TL 2,226.80 /MWh recorded on Friday, April 7th and the minimum MCP value of TL 461 /MWh recorded on Sunday, April 23rd.

According to the hourly data, the MCP was realized at the minimum price limit of TL 2,600 /MWh for 101 hours in total during April, while the hourly minimum electricity price, at TL 10 /MWh, realized for 5 hours on Sunday, March 23rd.

Based on the daily MCP analysis, the peak hours average (8AM-8PM) price was 2.4% lower than the average for all hours, to be recorded at TL 1,728 /MWh. The maximum price limit, of TL 2,600 /MWh was recorded for 51 hours during the peak hours, while the minimum price of TL 10 /MWh was realized on Sunday, April 23rd.



Source: EXIST, TSKB Economic Research





Sector News

Local News

- Türkiye's total natural gas imports decline by 7% in 2022.

According to the 2022 report published by Turkish Natural Gas Distributors Union (GAZBİR), Türkiye's natural gas imports declined by 7% year-on-year in the last year to 54.7 billion cubic meters (bcm). The report states that while the use of natural gas in commercial buildings decreased by 12% to 53.3 bcm in 2021, residential gas usage climbed by 8% to 18.1 bcm. According to the report, natural gas consumption by industry declined by 13% to 13.4 bcm, while the consumption of natural gas used in electricity generation declined by 31% to 14.5 bcm. (26 April 2023)

- Customs duty will not apply imported coal used for electricity generation.

According to the Presidential Decision published in the Official Gazette, additional financial obligations, which were determined as USD 15 per tonne, will not be applied for coal within the context of summary declaration, under the condition that a customs declaration is officially registered with its summary declaration also submitted, for imports of coal to be used for electricity generation within 30 days starting on 20 April 2023. This also covers coal imported and presented to the customs where a summary declaration has been submitted before 20 April 2023. (24 April 2023)

- Natural gas transportation from Türkiye to Bulgaria gets underway.

Within the context of the agreement signed between Türkiye and Bulgaria which will remain in effect for 13 years, around 55 million cubic meters per day of natural gas will be delivered from the Marmara Ereğlisi Liquefied Natural Gas (LNG) Terminal, owned by Petroleum Pipeline Company (BOTAŞ), to Bulgaria. In a statement, Burhan Özcan, the general manager of BOTAŞ, said that 1.5 bcm of natural gas will be delivered per year within the scope of the agreement with

Bulgaria, and added that the agreement covered a 13-year time period. (13 April 2023)

- USD 1.5 billion investment planned for wind and power electricity with storage.

In a statement, Mustafa Yılmaz, the President of the Energy Markets Regulatory Authority, stated that the first pre-license process for constructing wind and solar energy power plants with storage had been completed, with 12 projects now having received pre-licenses. Stating that these 12 projects with pre-licensing had a total installed capacity of 744 MW, Mr Yılmaz said that the total investment amount of these projects would be in the order of USD 1.5 billion. He added that the projections indicate that the USD 40-45 billion of investment will be realized. (10 April 2023)

- Türkiye "must utilize its solar potential in its southern provinces to realize its maximum solar energy potential" according to an EMBER assessment.

According to the study, Türkiye must establish a trajectory toward proper solar energy capacity utilization in the south and south-east regions in order to meet its solar energy capacity objective of 3-4 gigawatts (GW) of additional solar power capacity per year. According to the report, unlicensed power plants aimed at self-consumption are a stakeholder in the expansion of solar power, with annual applications for unlicensed power capacity increasing from 1.2 GW to 6 GW in 2022. Because of the drought in recent years, the report indicates that there is a need to boost wind and solar power generation, especially in Türkiye's western provinces. (7 April 2023)

- BOTAŞ cuts natural gas tariffs for large industrial and electricity generation customers.

According to the tariff table published by BOTAŞ, the sale price BOTAŞ will apply to natural gas distributor companies for residential consumers remained unchanged at TL 4,080 per 1000 cubic meters of natural gas. The tariff for industrial subscribers was also unchanged

for Stage-1 customers at TL 9,478 per 1,000 cubic meters, but with a 20% decrease for Stage-2 (large industrial subscribers). In addition, for the tariff for electricity generation was reduced by 16.67% to TL 10,000 per 1,000 cubic meters. (3 April 2023)

Foreign News

- North Sea to be home of Europe's Green Energy Power Plant. Nine European Union countries are planning to construct an off-shore wind farm with 120,000 MW of installed capacity by 2030, rising to 300,000 MW by 2050, on the North Sea. The Ostend Declaration, signed by Belgium, Luxembourg, Denmark, France, Germany, Ireland, the Netherlands, Norway and the UK covers the Atlantic Ocean, the Celtic and the Irish Seas in addition to the North Sea. (27 April 2023)

- Azerbaijan signs new natural gas supply agreement with four European countries. Azerbaijan's state-owned energy giant, Socar, signed a contract with transfer system operators in Romania, Bulgaria, Hungary, and Slovakia with the aim of boosting natural gas exports. With this agreement, Azerbaijan aims to pump 12 billion cubic meters of natural gas to Europe in 2023. (27 April 2023)

- Energy transition in low to middle-income nations to result in unprecedented expansion and change of electricity sector infrastructure. According to the World Bank's report, "Scaling Up To Phase Down: Financing Energy Transition in the Power Sector," this transformation of the power sector will require an increase in renewable energy and energy efficiency, as well as a gradual reduction in coal-fueled electricity output. According to the report, the solar power capacity of Bangladesh, Ghana, Morocco and Vietnam will be doubled or tripled during the next ten years. The report also emphasizes the necessity for a similar development in the installation of wind generating capacity both on land and at sea, in Bangladesh, Egypt, Jordan, Morocco, Türkiye and Vietnam. According to the study, energy efficiency investments capable of halving the rate of growth in demand will save USD 1.3 billion per year and reduce decarbonization costs by 20%. The report emphasizes that developing countries have to undertake more substantial investments than they are now to finance a just transition which is consistent both with the objectives of providing a universal access to energy that is affordable, credible, sustainable and modern by 2030, and in line with the Paris Agreement. The analysis also underlines the need to increase investments in the energy sector in low and middle-income countries, excluding China, from approximately USD 240 billion in the time period covering 2016-2020 to USD 1 trillion by 2030. (25 April 2023)

- Clean energy economy advancing faster than expected. In his speech at the G7 Leaders' Summit, Fatih Birol, the Executive Director of the International Energy Agency (IEA), said that the clean energy economy was moving forward faster than expected, especially in the fields such as solar power, electric cars and heat pumps. He also emphasized that governments should pay attention to these developments in their policy actions. Moreover, Dr. Birol remarked on the importance of ensuring that the supply chains which are vital for clean energy technologies are more credible, diverse and sustainable. (15 April 2023)

- Global wind power capacity to exceed 1 terawatt (TW). According to WoodMackenzie's market outlook report, global wind energy will surpass 1 TW of installed capacity in 2023. The report predicts that the off-shore wind power capacity of

30 countries will increase within ten years, with 80,000 MW in additional capacity set to come on stream on average each year, accounting for 50% of new capacity globally. (15 April 2023)

- Resources other than fossil fuels accounted for 39% of global electricity generation in 2022. According to Ember's "Global Electricity Outlook - 2023" report, the electricity generated in 2022 was the cleanest of all time. The report highlights the possibility of reducing fossil-fuel based electricity generation world-wide by 2023, while the share of solar and wind energy in total electricity generation reached 12%. According to the analysis, in spite of these developments, carbon emissions from the energy sector increased by 1.3% on the back of an increase in coal usage, while the decrease in fossil-fuel based emissions is expected to be limited to just 0.3% in 2023. Furthermore, the report estimates that the increase in wind and solar power energy generation will exceed the increase in total energy demand. (13 April 2023)

- Saudi Arabia approves memorandum of understanding signed with China in the field of clean hydrogen. According to the news, the agreement was signed between Saudi Arabia's Energy Minister and the International Energy Authority of the People's Republic of China for cooperation in the field of clean hydrogen energy field, aimed at developing clean energy technologies and increasing hydrogen commerce. (12 April 2023)

- Japan planning a six-fold increase in its hydrogen supply. There have been reports that Japan is planning a six-fold increase its hydrogen supply within 17 years to promote the use of renewable energy. Japan's Government is aiming to increase its hydrogen generation from 2 million tonnes to 12 million tonnes by 2040, with USD 113 billion in investment over the next 15 years. (06 April 2023)

- Pace of exiting coal generation "not adequate" according to a recent report. According to the report published by Global Energy Monitor, achieving the objectives of the Paris Agreement is contingent on not activating any new coal power plants in the world, and achieving a five-fold increase in the pace of exit from existing coal power plants by 5 times. According to the research, all power plants powered by coal should be decommissioned by 2040. While the report states that developed countries are expected to close their power plants by 2030, this requires closing 60 GW of coal power capacity in Organization for Economic Cooperation and Development member countries by 2030, and 91 GW in non-member countries by 2040. (6 April 2023)





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