

# Monthly Energy Bulletin

TSKB Economic Research

March 2024 #70

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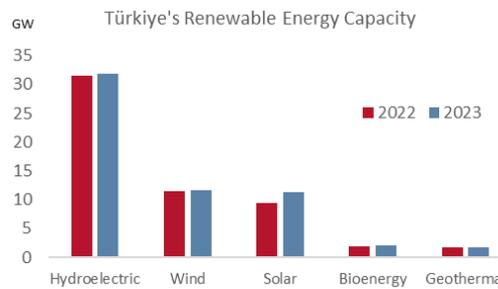
## Türkiye's renewable energy capacity reaches 58.5 gigawatts (GW) in 2023, with global renewable capacity reaching 3,870 GW.

The International Renewable Energy Agency (IRENA) published its 2024 Renewable Capacity Statistics. Accordingly, the global renewable energy capacity, which stood at 3,396 GW in 2022, increased by 473 GW and reached 3,870 GW in 2023. The report states that the share of solar energy in the capacity increase is 73% and the share of wind energy is 24.5%, while emphasizing that the share of the 298 GW increase in China in the total increase is 63%.

The report stated that Türkiye's renewable energy capacity increased to 2.5 GW in 2023, 74.2% of this increase comes from solar energy and 12.0% from wind energy, and as a result of these increases, the report pointed out that solar energy capacity in Türkiye increased to 11.3 GW and wind energy capacity increased to 11.7 GW.

The report emphasized that Türkiye's renewable energy capacity reached 58.5 GW by the end of 2023, stating that 54.4% of this capacity is hydroelectric, 20.0% is wind based and 19.3% is solar.

In its report of Türkiye Electricity Outlook, Ember Climate highlighted that the share of solar power plants in Türkiye's total electricity production, which was 4.9% in 2022, increased to 5.7% in 2023, while the share of wind energy reached 10.5%



Source: IRENA, TSKB Economic Research

<b>28.33</b> TWh	<b>2,190.1</b> TL/MWh
March Gross Generation	Average MCP

**5.4%**

Daily average licensed electricity generation increased by 5.4% MoM and 6.8% YoY in March

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**3.0%**

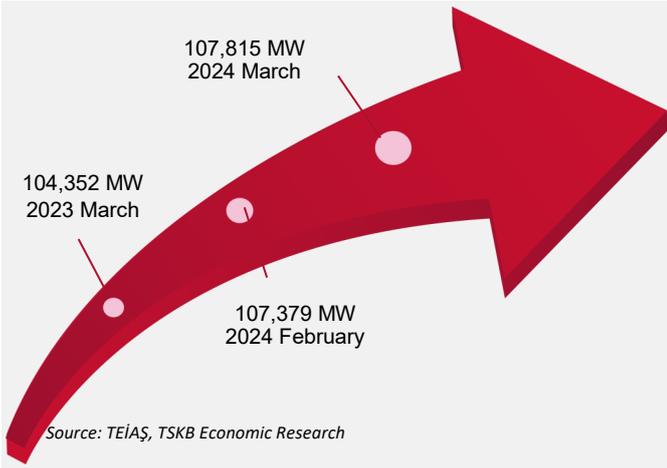
Market Clearing Price (MCP) increased by 11.9% MoM and 3.0% YoY in March.

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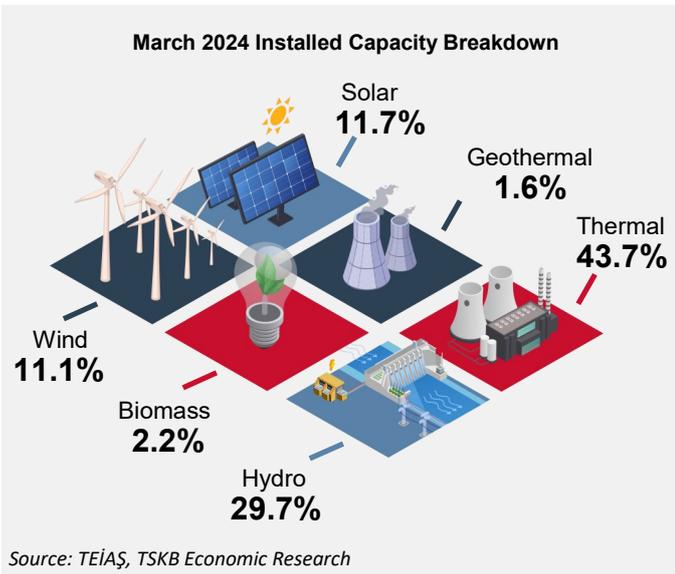


# Installed Capacity Analysis

Türkiye's total installed generation capacity, which stood at 107,379 megawatts (MW) at the end of February 2024, reached 107,815 MW in March 2024. A total of 436.3 MW in net installed capacity came on stream in March, with solar power plants accounting for 713.6 MW of this installed capacity. In the same period, the installed capacity of wind power plants increased by 75.1 MW and hydroelectric power plants by 14.8 MW compared to the previous month, while the capacity of power plants generating electricity from natural gas and multi-fuels decreased by 377.6 MW.

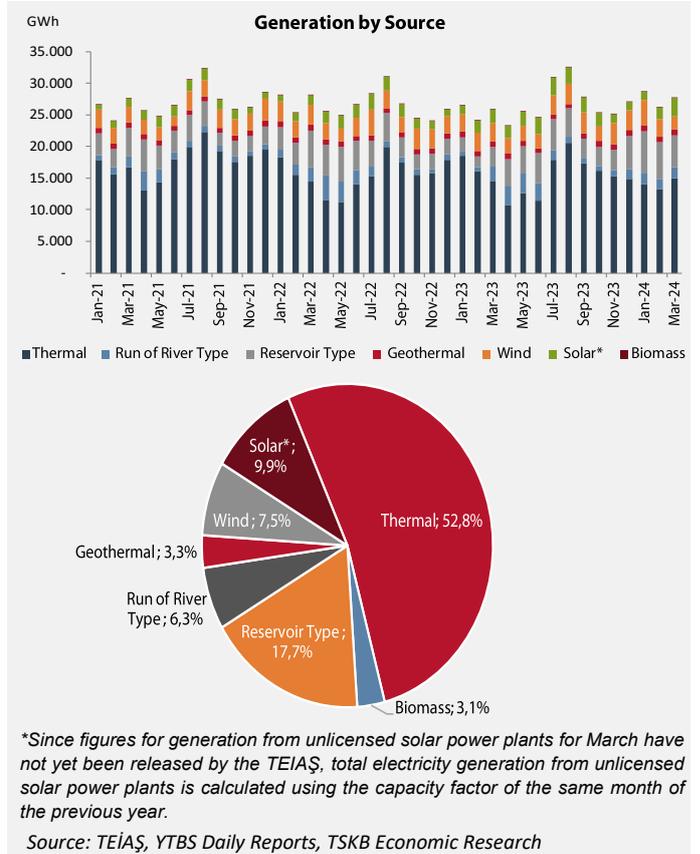


The share of renewable energy power plants in total capacity increased to 56.3% in March. Thus, the rate of renewable energy resources remained above 55% and continued to increase. Hydroelectric power plants accounted for 29.7% of the total installed electricity capacity in Türkiye, with wind and solar power plants accounting for a 22.8% share of total installed capacity.



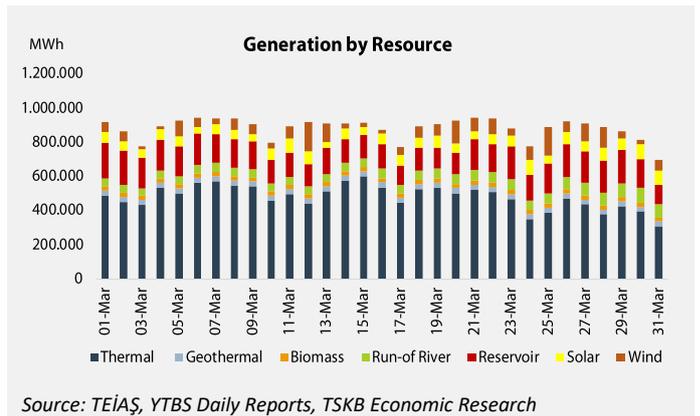
# Generation-Consumption Analysis

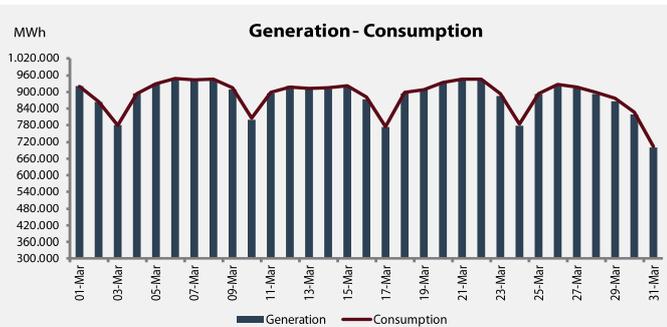
Total electricity generation, which stood at approximately 26.6 terawatt hours (TWh) in February 2024, increased to 28.33 TWh in March 2024. In addition, daily average electricity generation for March increased by 6.8% in comparison with the same period of the previous year, and by 5.4% in comparison with the previous month.



Thermal power plants provided 49.8% of the electricity generated in February 2024 and 52.8% of the total in March. A breakdown of generation by source finds that hydroelectric power plants, which had a 28.1% share of total generation in the previous month, generated 24% of the total electricity in March. In the same period, the share of electricity generated by wind power declined by 2.8 percentage points compared to the previous month to 7.5%. Geothermal energy power plants contributed 3.3% to total electricity generation.

The share of renewable energy power plants in electricity generation, which stood at 48.2% in February 2024, decreased to 44.6% in March. In the same period, dam-type hydroelectric power plants contributed 17.7% to total generation, while run-of-river-type hydroelectric power plants generated 6.3% of the total electricity. In addition, the ratio of electricity generated from wind and solar power plants in total electricity generation was recorded as 17.4%. Solar power plants were the second biggest source of electricity after dam-type hydroelectric power plants, with a 9.9% share of total generation in March.





Source: TEİAŞ, YTBS Daily Reports, TSKB Economic Research

Licensed power plants generated an average of 884,914 MWh of electricity per day in March. The maximum generation from licensed power plants during the month was 948,020 MWh on Wednesday, 6 March with the minimum generation recorded on Sunday, 31 March, at 699,951 MWh.

During the same period, the daily average electricity consumption stood at 888,085 MWh with the maximum electricity consumption recorded on Wednesday, 6 March (948,052 MWh) and the minimum on Sunday, 31 March (703,147 MWh).

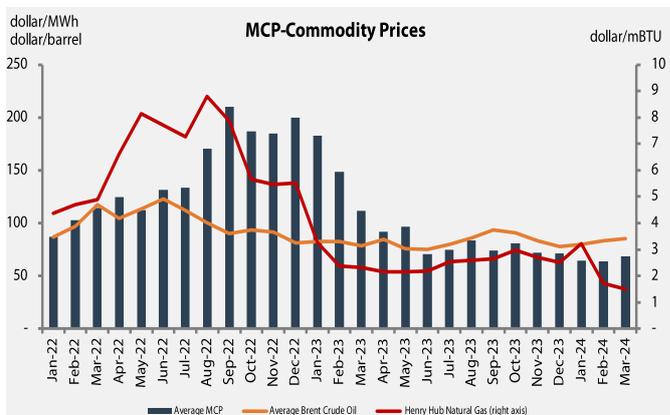
## Electricity Price Analysis

The daily average market clearing price (MCP) ranged from TL 1,260.00/MWh to TL 2,570.0 TL/MWh in March. The average daily MCP stood at TL 2,191.10/MWh in March with the highest daily average MCP value recorded on Thursday, 14 March at TL 2,566.9 TL/MWh and the lowest on Sunday, March 31, at TL 1,269.0/MWh.

In an analysis of the hourly data, the MCP reached the maximum price limit of TL 2,700/MWh in March for a total of 61 hours. The minimum hourly electricity price of 0 TL/MWh was recorded for the period between 11AM-13PM on Sunday, 31 March.

In an analysis of the daily MCP for March, the peak hours average (8AM to 8PM) was 6.0% below the all hours average value, at TL 2,063.40/MWh. During peak hours, the highest limit price of TL 2,700 /MWh was recorded for 35 hours, with the lowest price of 0 TL/MWh recorded for 3 hours.

During the same period, the average off-peak hours (8PM-8AM) rate was TL2,316.80/MWh. The maximum limit price of TL 2,700/MWh was reached for 26 hours during off-peak hours, with the lowest price of 650.0 TL/MWh recorded between 7-8AM on Wednesday, 31 March. The MCP, which averaged USD 63.70/MWh in February 2024, increased to an average of USD 68.40/MWh in March, marking a fall of 38.8% compared to the same period of the previous year in dollar terms.



Source: EPIAŞ, TCMB, EIA, TSKB Economic Research

### Average Commodity Prices

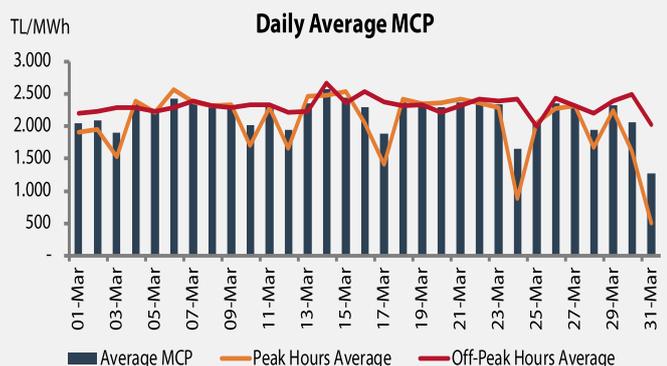
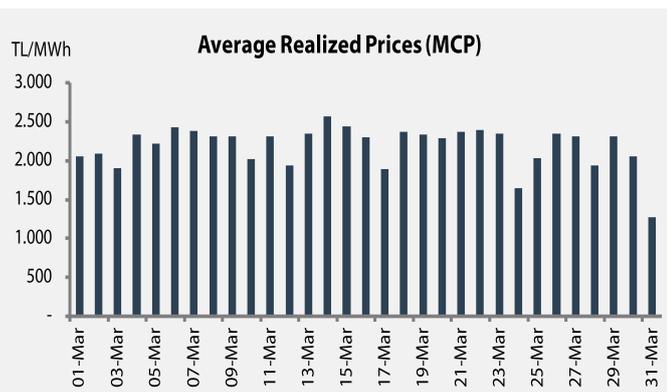
Brent oil prices increased to USD 85.36 per barrel in March, from an average of USD 83.3 per barrel in February 2024, marking a 2.4% monthly rise. This average price was 8.8% higher than the same period of the previous year.

The Henry Hub natural gas contract price, which averaged USD 1.73/mbtu in February, decreased by 13.9% on a monthly basis to USD 1.49/mbtu, marking a fall of 35.5% compared to the same period of the previous year.

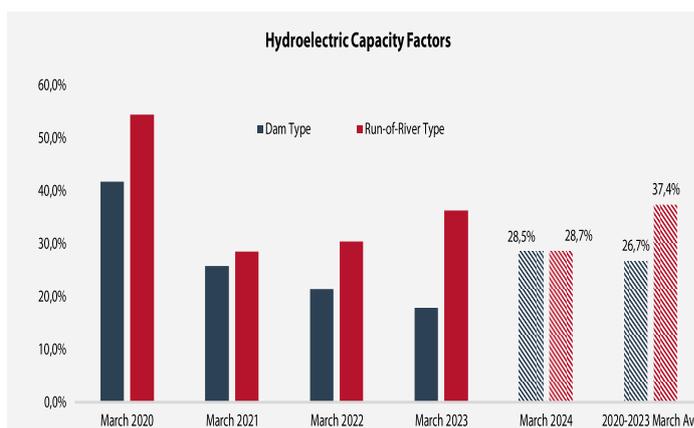
### Hydroelectric Capacity Factors

Capacity factors for dam-type hydroelectric power plants and run-of-the-river type hydroelectric power plants stood at 28.5% and 28.7% respectively in March 2024. Compared to March 2023, capacity factors increased by 11 percentage points for dam-type power plants in March, with a decrease of 8 percentage points for run river-of the type power plants. Conducting a comparison for the months of March over the last 5 years, it is seen that capacity factors for both types of power plants was 19.5 percentage points lower, on average, in March 2024 than in March 2020, when the rates were at their highest.

While capacity factors of dam-type hydro-electric power plants was 1.8 percentage points higher than the March 2020-2023 average, the capacity factors of run-of-the-river type hydro-electric power plants was 8.7 percentage points below the average.



Source: EXIST, TSKB Economic Research



Source: TEİAŞ, EPIAŞ, TSKB Economic Research



## Sector News

### Local News

- **"MW100-Türkiye's Top 100 Electricity Producers 2024 Report"** prepared by Energy Daily and Kearney Türkiye published. The report stated that the proportion of renewable energy in Türkiye's electricity generation capacity was increasing gradually, with Elektrik Üretim A.Ş. (EÜAŞ) accounting for 20% of the country's generation capacity. The report added that Türkiye's installed generation capacity increased by 3% to exceed 106 GW in 2023, while the total solar energy capacity increased by 20% to reach 11.3 GW. According to the report, EÜAŞ is followed by ENKA, EnerjiSa, Cengiz Enerji and Eren Enerji in terms of installed generation capacity.

- **Türkiye's natural gas production on course to reach 13 billion cubic meters (bcm) by 2050.** According to the 2050 Outlook report published by the Gas Exporting Countries Forum, global natural gas production is expected to increase by 1.3 trillion cubic meters compared to 2022, reaching 5.3 trillion cubic meters by 2050. The report also states that Türkiye is expanding as a natural gas producer in Europe with the expansion of the Sakarya field and the recent discoveries in the South Akçakoca Sub-Basin.

- **TSKB publishes its Climate Report.** TSKB published its second Climate Report, in line with the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD) in 2021. In the report, TSKB outlined its determination to tackle climate change, its current work and areas of development, and also shared its future perspective. The CEO of TSKB, Murat Bilgiç, whose views were included in the statement issued by the bank, stated that TSKB assessed climate risks and incorporated them into their lending processes, and would con-

tinue to generate permanent value in the coming period to minimize climate risks and achieve tangible success.

- **Oil Pipelines Corporation (BOTAŞ) to invest TL 14.1 billion in transmission networks in 2024.** According to the Board Decision published in the Official Gazette, the Energy Market Regulatory Authority (EMRA) approved an amount of TL 14.1 billion for transmission network investments within the scope of the 2024 Natural Gas Transmission Network Investment Program.

- **Ministry of Energy and Natural Resources (MENR) publishes 2021 Türkiye National Electricity Network Emission Factor Information Form.** Based on the proposals set out, it will be possible to avoid 0.6488 tonnes in CO<sub>2</sub> emissions for each 1 MWh of electricity generated by a solar or wind power plant established in 2020, while this value was calculated as 0.6345 in CO<sub>2</sub> emissions for 2021.

- **MENR publishes 2021 Türkiye Electricity Production and Electricity Consumption Point Emission Factors Information Form.** Emission factors represent the amounts of greenhouse gas emissions released per unit gross electricity production and unit electricity consumption. Accordingly, lignite power plants, which produced 1,120 tonnes of CO<sub>2</sub> emissions for each 1 MWh of electricity generated in 2020, led to 1,165 tonnes of CO<sub>2</sub> emissions in 2021, with coal-fired power plants, which caused 1,013 tonnes of CO<sub>2</sub> emissions in 2020, causing 0.998 tonnes of CO<sub>2</sub> emissions in 2021.

- **President Recep Tayyip Erdoğan confirms that all reactors in the Akkuyu Nuclear Power Plant will be commissioned in 2028 and generate 35 TWh of electricity.**

- **Directorate of Climate Change releases 2024-2030 Climate Change Mitigation Strategy and Action Plan.** The plan aims to determine Türkiye's goals in tackling climate change and setting out activities to be carried out in the energy, industry, construction, transportation, waste, agriculture and "Land Use, Land Use Change and Forestry" sectors. The plan, which considers seven main reduction sectors as well as fair transition and carbon pricing mechanisms as its main theme, aims to reduce CO<sub>2</sub> emissions per unit of electricity generation by 20% by 2030. In addition, work is planned to be carried out on sustainable biogas and green hydrogen certification, the creation of biogas legislation and standards and directing into natural gas networks.

- **Directorate of Climate Change releases the 2024-2030 Climate Change Adaptation Strategy and Action Plan.** The plan aims to ensure that people living in Türkiye, the public and private sector institutions are prepared for and adapt to the effects of climate change by 2030. In this vein, the plan covers cities, water resources management, agriculture and food security, biodiversity and ecosystem services, public health, energy, industry, tourism and cultural heritage, transportation and communication, social development and disaster risk reduction. The 40 strategic goals determined in the plan include increasing the amount of treated wastewater, increasing the reuse rate of treated wastewater to 15% by 2030 and prioritizing investments in critical sectors to build resilience against climate change-related disasters. In addition, the plan aims to update the agricultural policies in a manner resistant to climate change and which uses technology effectively, taking into account the product pattern and water budget of the basin.

- **Türkiye's first floating solar power plant enters operation.** The Minister for Agriculture and Forestry, İbrahim Yumaklı stated that the floating solar power plant, which was built on the Keban reservoir in Elazığ with an installed capacity of 1 MW, consisted of 1,840 solar panels over an area of 6 decares. He added that the electricity to be obtained from the test production would be used first in agricultural production.

- **World Bank to provide resources for the "Accelerating Market Transition for Distributed Energy in Türkiye Project".** As the first step of the Europe and Central Asia Renewable Energy Scale-up (ECARES) program, which has a total loan value of USD 2 billion, this project will provide USD 657 million of resources to Türkiye. The project, which will be carried out by TSKB and the Development and Investment Bank of Türkiye (TKYB), will focus on expanding the distributed solar energy market for end users and electricity storage systems through batteries in order to support Türkiye's goal of generating 60 GW of solar and wind energy by 2035. The World Bank Türkiye Country Director Humberto Lopez stated that Türkiye had undertaken one of the most ambitious programs regarding the energy transformation seen in developing countries recently, adding that the World Bank supported the country's efforts to ensure energy security, reduce energy costs for end users and tackle climate change.

## Foreign News

- **International Energy Agency (IEA) publishes 2023 CO2 Emissions Report.** According to the report, energy-related CO<sub>2</sub> emissions increased by 1.1% in 2023, reaching 37.4 billion tonnes to reach a new record, with coal-related emissions accounting for more than 65% of the increase in emissions in 2023. While the report stated that energy-related emissions increased by approximately 900 million tonnes between 2019

and 2023, it also emphasized that this increase in emissions since 2019 would have been triple had it not been for clean energy technologies such as solar photovoltaic, wind, nuclear, heat pumps and electric cars. Additionally, while the IEA noted that there had been a structural slowdown in emissions amid a growing use of clean energy, global emissions have increased by 0.5% annually over the past decade, the slowest rate since the Great Depression.

- **Global Energy Monitor (GEM) publishes European Natural Gas Tracking 2024 report.** The GEM estimates that Europe's natural gas import capacity will increase by 248.7 billion cubic meters (55% of current import capacity) by 2030, with an expenditure of EUR 44.4 billion for liquefied natural gas (LNG) import terminals and EUR 39.7 billion for pipeline infrastructure. In addition, the report emphasizes that the share of Germany, Italy and Greece accounted for around EUR 45.3 billion of the EUR 84.1 billion total cost.

- **The Organization of the Petroleum Exporting Countries (OPEC) raises its forecast for crude oil demand in 2024 by 0.06 million barrels per day compared to its previous forecast.** According to OPEC's Monthly Oil Market Report for March, oil demand for 2024, previously projected at 104.4 million barrels per day, is projected to reach 104.46 million barrels per day. In addition, OPEC set its forecast for oil demand for 2025 to 106.3 million barrels per day.

- **IEA publishes Global Methane Tracker 2024 report.** The report estimates that the production and use of fossil fuels increased by 2.6% in 2023 compared to the previous year, resulting in around 118 million tonnes of methane emissions, while the use of biomass remained unchanged, leading to 10 million tonnes of methane emissions. The report highlights that total methane emissions from the energy sector approached their peak in 2019 (129 million tonnes), warning that in order to limit global warming to 1.5°C, methane emissions from fossil fuels would need to decrease by 75% compared to current levels by 2030. It is estimated that approximately USD 170 billion in investment will be needed to implement methane reduction measures.

- **IEA publishes its March Oil Market Report.** IEA, which had projected total oil demand of 101.96 million barrels per day for 2024, now expects an increase in oil demand of 1.3 million barrels per day, an upward revision of 110,000 barrels per day over its February report due to the increase in demand for oil. The report states that oil demand had returned to its historic trend of slow growth after several years of volatility following the pandemic, adding that the weak economic outlook, increased productivity and increase in electric vehicle sales had also constrained demand for oil.



- **US Energy Information Administration (EIA) raises its Brent crude oil price forecast for 2024.** The March Short-Term Energy Outlook Report published by EIA predicts that the Brent crude oil price will average \$87 per barrel in 2024 due to production cuts by OPEC and its Allies. In February, the EIA announced its Brent crude oil price forecast as USD 82.42 per barrel for 2024.

- **IRENA publishes its report following COP28 results.** The report states that achieving the goal of tripling renewable energy capacity set by the COP28 by 2030 will only be possible by creating conditions favourable for growth. While IRENA emphasizes that achieving this target is economically viable, it also outlines that the increase requires financing, infrastructure supported by closer international cooperation, policy support and joint efforts to develop the necessary workforce.

- **Slovakia decides to halt production at its last coal-fired power plant.** With the cessation of production at the power plant, which will completely wind down operations by the end of June, almost all of the electricity generated in Slovakia will be provided from nuclear power and renewable resources, with no direct CO<sub>2</sub> emissions from electricity.





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