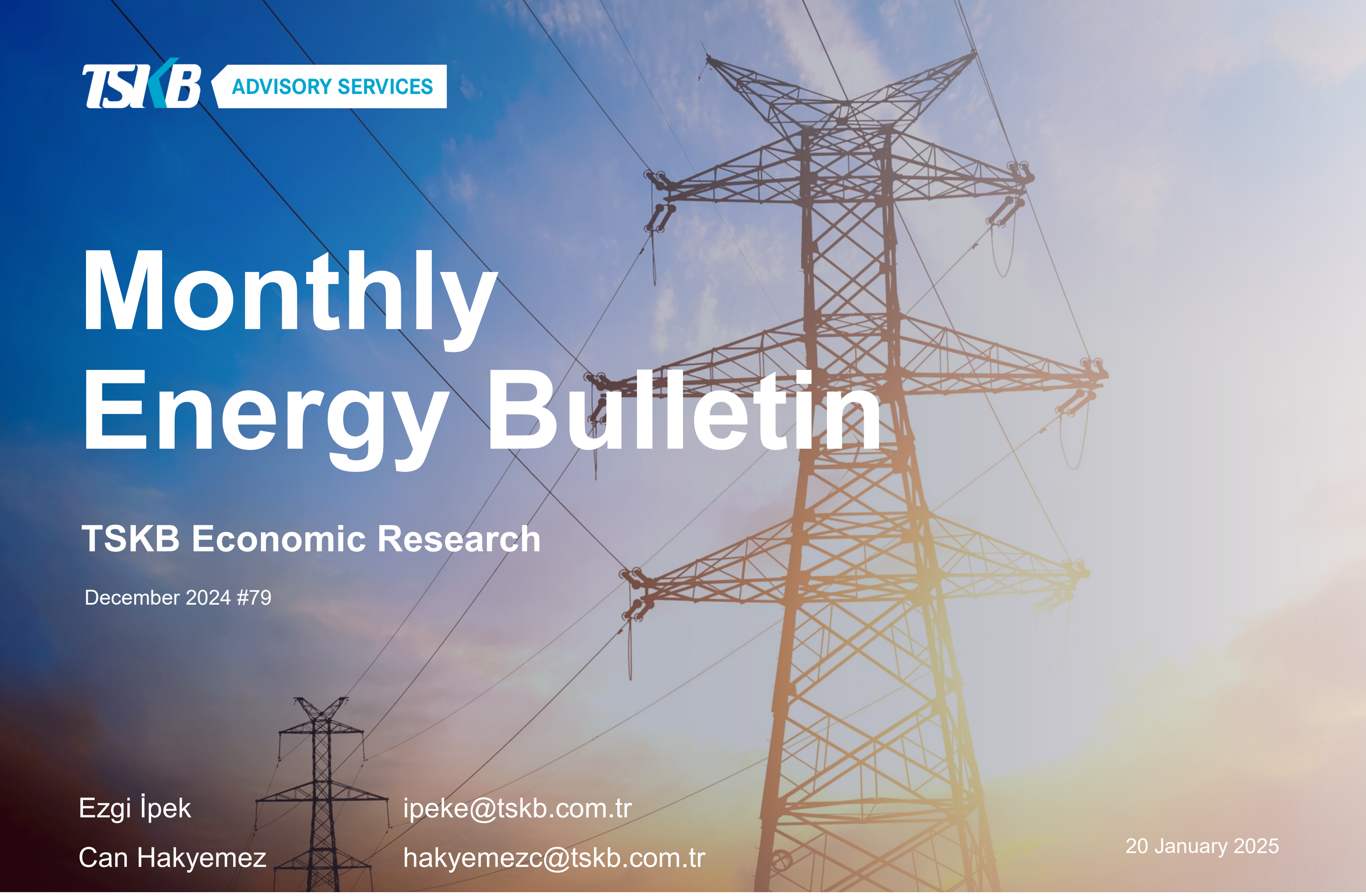

TSKB ADVISORY SERVICES

Monthly Energy Bulletin

TSKB Economic Research

December 2024 #79

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20 January 2025

More than USD 7 billion invested in strategic areas of the Turkish energy sector in the last 5 months

President Recep Tayyip Erdoğan emphasized that these investments in strategic areas such as electric vehicles, solar and battery cells and wind turbines were made within the scope of HIT-30, and that the support provided in natural gas and electricity would be reconsidered with a fair model that will benefit those who need it most. The Minister of Energy and Natural Resources, Alparslan Bayraktar, on the other hand, added that direct support was provided in 2024, including TL 175 billion for electricity in housing and TL 256 billion for natural gas, adding that there would be no increase in energy prices in January 2025.

In his statements, Mr. Bayraktar stated that the government expected the permit processes to be another issue that would come to the forefront in the energy sector in 2025, with plans to start the "super permit" period in order to shorten the permit processes of renewable energy investments. According to Mr. Bayraktar's statements, the government aims to shorten the permit processes and pass them through the Turkish Grand National Assembly in the first quarter of 2025. Emphasizing the need to invest in 7,500 megawatts (MW) of capacity each year in order to achieve the renewable energy installed power targets for 2035, Mr. Bayraktar stated that processes such as Environmental Impact Assessment (EIA) would be shortened with the "super permit" mechanism in order to pave the way for investments. In addition, the Deputy Minister of Energy and Natural Resources Zafer Demircan stated that preparations had been completed to reduce the permit processes for renewable energy investments form the current period of approximately 48 months to 24 months.

Deputy Minister Zafer Demircan stated that another prominent issue in renewable energy investments concerned electricity transmission lines, with the government aiming to expand Türkiye’s network of transmission lines from approximately 75,000km now to 90,000 km. He added that the USD 20 billion investment required for this will be spread over a 10-year period.

Stating that the investments undertaken in renewable energy had so far prevented USD 132 billion in natural gas imports, Deputy Minister Demircan added that these investments in the renewable energy sector had reduced carbon emissions by 890 million tonnes.

30.4 TWh	2,446.2 TL/MWh
December Gross Generation	Average MCP

6.7%

Daily average licensed electricity generation increased by 6.7% MoM and 9.9% YoY in December.

Click for details.

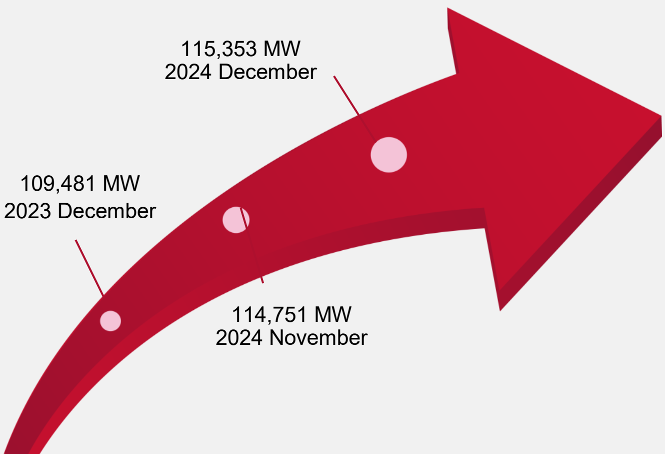
0.7%

Market Clearing Price (MCP) decreased by 0.7% MoM and increased by 17.9% YoY in December.

Click for details.

Installed Capacity Analysis

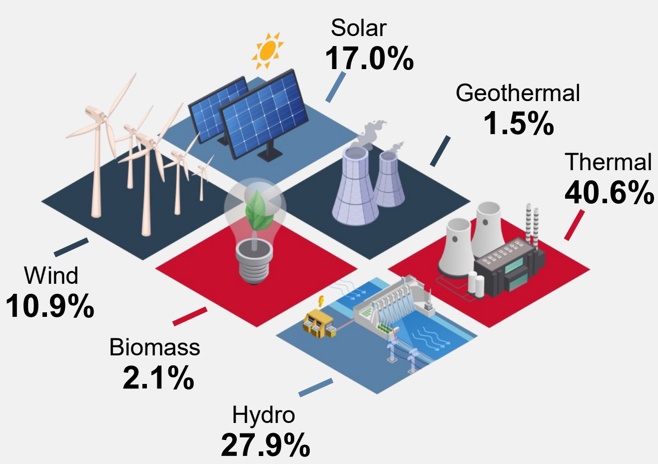
Türkiye's total installed capacity, which stood at 114,751 MW at the end of November 2024, reached 115,353 MW in December. A total of 602.4 MW of net additional installed power was commissioned in December compared to the month of November with 432.7 MW of this installed capacity provided by solar power plants. The installed capacity of wind farms increased by 129.7 MW with the installed capacity of geothermal power plants increasing by 36.8 MW. While the installed capacity of natural gas and multi-fuel power plants increased by 0.6 MW and the installed capacity of power plants using renewable waste increased by 2.7 MW, no change was observed in the installed capacity of other sources.



Source: TEİAŞ, TSKB Economic Research

59.4% of the capacity in operation in December consisted of power plants generating electricity from renewable sources. Thus, the proportion of renewable resources continued to increase, approaching the 60% threshold. Hydroelectric power plants accounted for 27.9% of Türkiye's total installed electricity capacity, while the share of wind and solar power plants in total installed capacity approached the share of hydroelectric power plants.

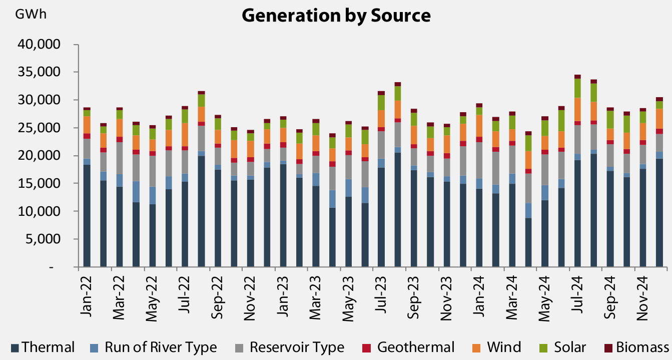
December 2024 Capacity Share by Source

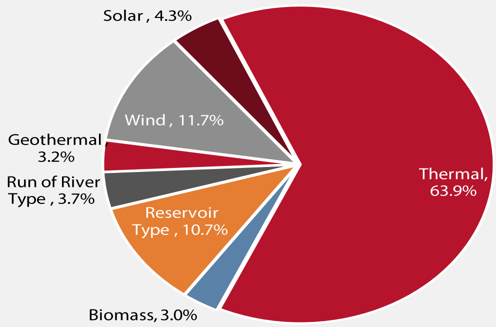


Source: TEİAŞ, TSKB Economic Research

Generation-Consumption Analysis

Total electricity generation stood at 30.4 TWh in December, up from approximately 28.5 TWh in November 2024. However, the average daily electricity generation for December increased by 6.7% compared to the previous month and by 9.9% compared to the same period of the previous year.

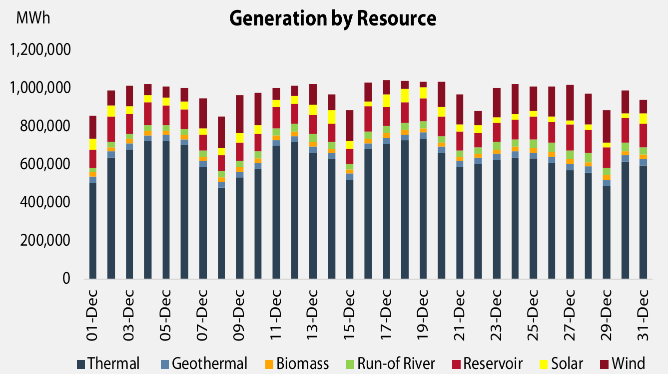




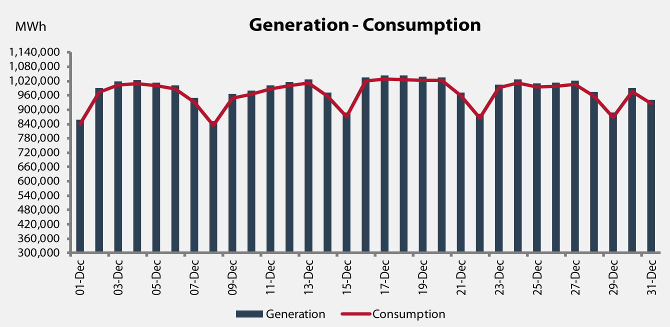
Source: TEİAŞ, YTBS Daily Reports, TSKB Economic Research

Thermal power plants, which provided 61.7% of the electricity generated in November, provided 63.9% of the total electricity generated in December. Looking at the source-based breakdown of electricity generated from power plants, hydroelectric power plants generated 14.5% of all electricity in December, compared to 15.0% in the previous month. In the same period, solar power plants accounted for 4.3% of the electricity generated with geothermal power plants accounting for 3.2% of the total.

The share of renewable energy plants in electricity generation edged down from 35.8% in November 2024 to 33.7% in December 2024. In the corresponding period, dam-type hydroelectric power plants contributed 10.7% to total generation, while run-of-river type hydroelectric power plants met 3.7% of total generation. In addition, wind and solar power plants generated 16% of the total electricity generated during the month with the majority of that (11.7% of total electricity generation) being provided by wind farms.



Source: TEİAŞ, YTBS Daily Reports, TSKB Economic Research



Source: TEİAŞ, YTBS Daily Reports, TSKB Economic Research

On average, daily electricity generation stood at 983,477 megawatt hours (MWh) in December with the highest level during the month being 1,043,848 MWh on Tuesday, December 17 and the lowest being 853,761 MWh on Sunday, December 8.

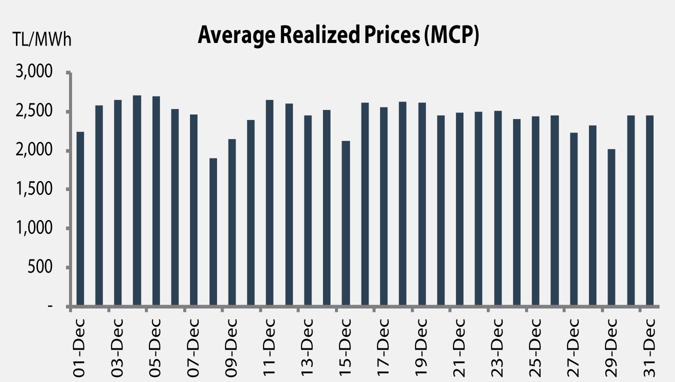
In the same period, average daily electricity consumption stood at 967,337 MWh with the highest consumption recorded on Tuesday, December 17 at 1,028,425 MWh and the lowest consumption recorded on Sunday, December 8, at 834,455 MWh.

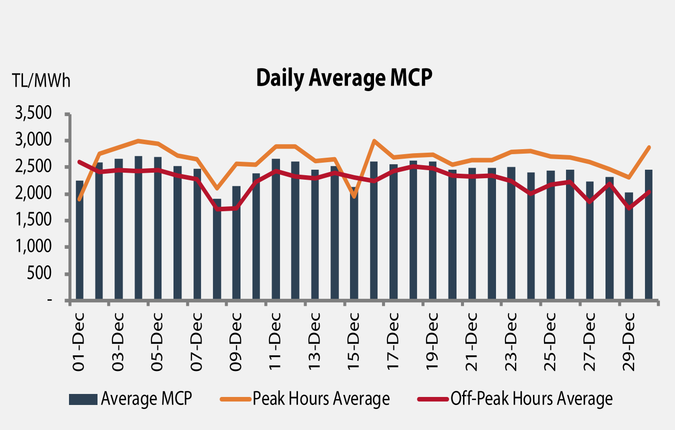
Electricity Price Analysis

In December, the daily average market clearing price (MCP) fluctuated between TL 1,900-2,725 /MWh. The daily average MCP in December was TL 2,446.20 /MWh with the highest daily average MCP recorded on Wednesday, December 4 at TL 2,712.20 /MWh and the lowest daily average MCP being on Sunday, December 8 at TL 1,908.30 /MWh.

Looking at the hourly data, the MCP was realized at its maximum of TL 3,000 /MWh for a total of 105 hours in December. The hourly minimum electricity price of TL 319.3 /MWh was recorded for 1 hour.

Looking more deeply at the MCP in December, the average peak hours rate (beween 8AM and 8PM) was 7.9% higher than the average for all hours to be recorded at TL 2,640.70 /MWh. The maximum limit price of TL 3,000 /MWh was recorded on 100 occasions during peak hours while the lowest price of TL 319.30 /MWh was realized for one hour during peak hours.



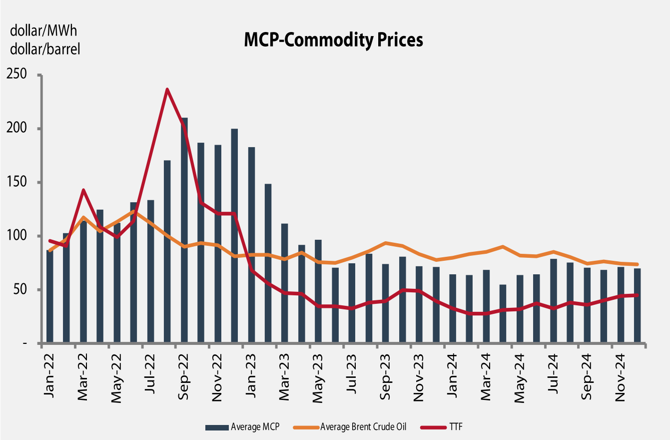


Source: EXIST, TSKB Economic Research

In the same period, the average off-peak rate (between 8PM and 8AM) was TL 2,251.80 /MWh with the maximum limit price of TL 3,000/MWh realized for five hours during off-peak hours and the lowest off-peak price of TL 1,000 /MWh recorded between 2-3AM on Friday, December 27.

The average MCP decreased from USD 71.50/MWh in November to USD 70.00 /MWh in December, marking a fall of 2.0% compared to the same period of the previous year in dollar terms.

Average Commodity Prices



Source: EPİAŞ, TCMB, EIA, TSKB Economic Research

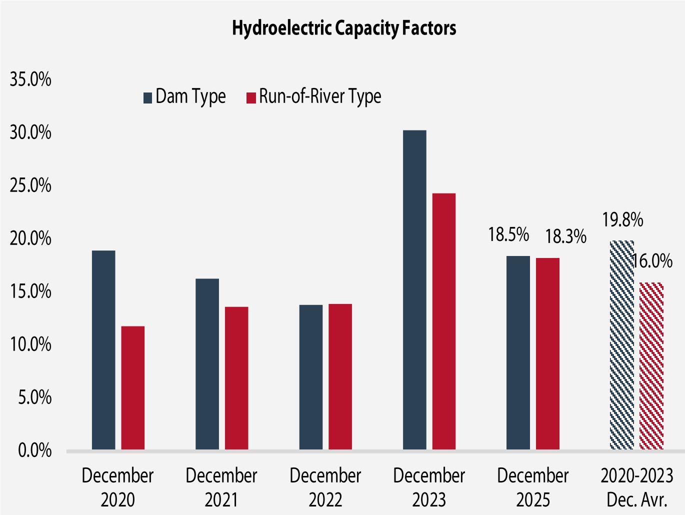
The price of Brent oil decreased by 0.8% from an average of USD 74.3/bbl in November to USD 73.70 /bbl in December, which was 5.0% lower than the same period of the previous year.

The TTF natural gas contract price, which averaged USD 44.6 /MWh in November, increased by 0.4% month-on-month to USD 44.8 /MWh in December, to stand 13.8% higher than in the same period of the previous year.

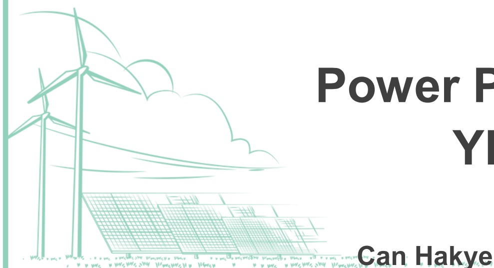
Hydroelectric Capacity Factors

The capacity factors of dam and run-of-river type hydroelectric power plants stood at 18.5% and 18.3%, respectively, in December 2024. When compared to December 2023, this marked a decrease of 11.8 percentage points for dam type power plants and a fall of 6.1 percentage points for run-of-river type power plants in December 2024. Comparing with the months of December over the last 5 years, the year with the highest capacity factor was December 2023.

The capacity factor for dam-type hydroelectric power plants was 1.4 percentage points lower than the averages for the months of December between 2020 and 2023, while the capacity factor of run-of-river type power plants was 2.3 percentage points higher than the average.



Source: TEIAS, EPIAS, TSKB Economic Research



Power Plants to Benefit from YEKDEM in 2025

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The list of renewable energy plants seeking to benefit from the Renewable Energy Resources Support Mechanism (YEKDEM) was published by the Energy Market Regulatory Authority (EMRA) on December 31, 2024. This list, which is published every year, sets out the power plants that will benefit from YEKDEM in the relevant year.

According to the final renewable energy sources list for 2025, 755 power plants with a total mechanical capacity of approximately 17,666 megawatts (MWm) will benefit from YEKDEM prices in 2025. When all data since 2022 is examined, we can see that the number of power plants benefiting from YEKDEM has decreased.

According to the data published by EMRA, while a total of 1,034 power plants benefited from YEKDEM in 2022, the number of power plants included in the final RES list decreased to 882 in 2023 and to 778 in 2024. Based on the resource breakdown of these power plants, 49.3% of the power plants benefiting from the YEKDEM scheme in 2022 were hydroelectric power plants with 36.3% being wind farms. In 2025, the share of hydroelectric power plants decreased to 35.6%, while the share of wind farms increased to 43.8%. Looking at the total capacity of the resources, it is noteworthy that the total mechanical capacity of hydroelectric power plants decreased in the last 4 years from 11,902 MW in 2022 to 6,288 MW in 2025.

Number of Power Plants Benefitting from YEKDEM by Year

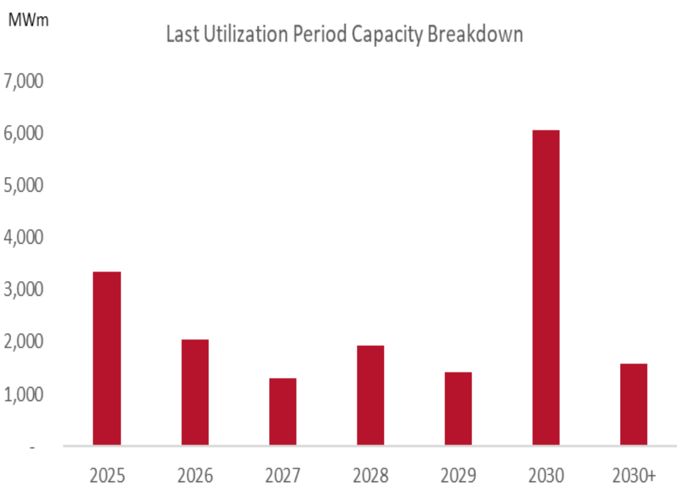
Year	Total Number of Power Plants	Main Source (MWm)	Number of Power Plants with Auxiliary Sources	Auxiliary Source (MWm)
2022	1034	24,144	1	80
2023	882	19,637	15	152
2024	778	17,672	35	399
2025	755	17,666	58	595

Source: EMRA, TSKB Economic Research

However, another eye-catching development was the increase in the number of hybrid power plants. In 2022, only one hybrid power plant with a mechanical capacity of 80 MW was included in the final RES list, while a total of 58 hybrid power plants will be included in this list in 2025. While the total mechanical capacity of hybrid power plants in 2025 will increase to 595 MW, it is seen that all auxiliary sources in hybrid power plants will consist of solar panels by 2025. In this context, 7.7% of the companies benefiting from the YEKDEM mechanism in 2025 will be hybrid power plants. It could be claimed that more of the power plants benefiting from YEKDEM in the coming years will be hybrid power plants.

Another point that needs to be examined in the final RES lists is the last utilization period of the power plants included in YEKDEM. While the last utilization period of 98 of the 755 power plants aiming to benefit from YEKDEM in 2025 was in 2025, the last utilization period for 46 of the power plants is after 2030.

When we examine the development of the figures over the years, the total mechanical capacity of the power plants with a final utilization period of 2025 is 3,345 MW while this figure is 6,053 MW for power plants with a final utilization period of 2030. Considering that plants must have been in operation for 10 years from the date of commissioning to benefit from YEKDEM, it is seen that the power plants commissioned in 2021 and before 2021 constitute a large proportion of the power plants benefiting from YEKDEM.



Kaynak: EMRA, TSKB Economic Research

Sector News

Local News

- Türkiye's primary energy intensity in 2023 was 0.126 tons of oil equivalent (toe) per thousand 2015 US Dollars, while the final energy intensity was 0.097 toe per thousand 2015 US Dollars. According to the 2023 Primary and Final Energy Intensity data announced by the Ministry of Energy and Natural Resources (ETKB), primary energy intensity decreased by 4.5% and final energy density decreased by 4.0% in 2023 compared to 2022. Compared to 2000, there was a 34.3% improvement in primary energy density and a 35.0% improvement in final energy density. Although Türkiye's primary energy intensity in 2023 is lower than the world average (0.165 toe per thousand 2015 US Dollars), it remains higher than the Organization for Economic Co-operation and Development (OECD) average of 0.093 toe per thousand 2015 US Dollars).

- UK Export Finance Agency plans to provide USD 2 billion in financing to Türkiye. According to the statements from the Minister of Energy and Natural Resources, Alparslan Bayraktar, the financing is expected to be provided in line with the Renewable Energy 2035 Roadmap with the memorandum of understanding signed between the two countries in the field of energy. Mr. Bayraktar stated that the government had proposed projects in three main areas, and that the 24,000 MW in renewable energy capacity, offshore wind energy and Renewable Energy Resource Areas (YEKA) projects that the industry was seeking to establish were important in this context.

- Akbank provides USD 100 million in green financing to Enerjisa Enerji Uretim. The financing will be used for the 750 MW wind farm to be built by Enerjisa Enerji Üretim within the scope of the YEKA (YEKA RES-2) model for wind energy.

- Minister of Energy and Natural Resources, Alparslan Bayraktar, announces plans to shorten permit processes in mines. Emphasizing that it takes at least 13 years for a metallic mine site to start production, Minister Bayraktar stated that the government aimed to improve the investment environment by shortening the permit periods. In addition, he added that Türkiye's goals in the field of mining included increasing legal reliability and predictability, reducing the current account deficit with new reserve discoveries and ensuring security of supply in critical minerals.

- Daily natural gas production in Sakarya Gas Field increases to approximately 7 million cubic meters per day, with Türkiye's total natural gas production reaching 20 million cubic meters per day. According to statements from the Minister of Energy and Natural Resources, Alparslan Bayraktar, production at the Sakarya Gas Field is targeted to reach 10 million cubic meters per day in the first quarter of 2025, meeting the natural gas needs of 17 million residential subscribers. Mr. Bayraktar added that in the first 11 months of 2024, TL 314 billion in electricity and natural gas bills had been covered by the state, adding that 60% support was provided for electricity used in homes with low levels of consumption, 40% at the high levels of consumption and 63% for natural gas.

- TurkStat publishes Energy Calculations for 2022. Accordingly, total energy flows in 2022 amounted to 19,612 petajules, while energy products had the highest share with 53.4% in total physical energy resources. In terms of destinations of physical energy, economic activities had the largest share with 52.7%, while manufacturing industry had the highest share among economic activities at 39.9%. In the final use of energy products, petroleum products consumed the most with a rate of 41.5%, followed by natural gas with 22.9% and electricity with 21.4%.

- EMRA publishes Preliminary Renewable Energy Source List for 2025. The list includes 755 licensed generation facilities that have applied to benefit from the Renewable Energy Resources Support Mechanism (YEKDEM) in 2025. While these generation facilities had a total installed capacity of 17.1 GW, the 778 power plants on the 2024 list had an installed capacity of 17.6 GW.

- Regulation on Collecting Activities in the Electricity Market published in the Official Gazette. In the Regulation, aggregation is defined as the market activity carried out within the scope of the operation of the production and/or consumption of one or more network users by combining them, and the general principles for these activities are explained. According to the regulation, which entered force on January 1, 2025, unlicensed generation facilities with an installed capacity of less than 100 MW and which have completed the ten-year purchase guarantee will be able to be included in the collector portfolio with an aggregated upper limit of 2,000 MW. The total installed capacity of unlicensed power plants in the portfolio may not exceed 500 MW. In addition, eight separate regulations were put in place for aggregation, energy storage and the demand-side mechanism.

- Ministry of Environment, Urbanization and Climate Change increases obligation to use renewable energy in new buildings from 5% to 10% within the scope of "Almost Zero Energy Building (NSEB)". Accordingly, as of January 1, buildings with a total building construction area of 2,000 square meters or more will be required to be built as "NSEB", while 10% of the energy used by new buildings must be met by renewable energy systems such as solar energy panels and heat pumps. According to the statement issued by the Ministry, a total of 2,200 buildings have been designed in accordance with NSEB standards since 2023, which are designed to be approximately 25% more energy efficient than a normal building, thus saving 281 gigawatt hours (GWh) of energy annually and reducing carbon dioxide equivalent carbon dioxide greenhouse gases by 66,000 tonnes. It is aimed that 30,000 NSEB-complaint buildings will be built each year by 2025, saving 1,850 GWh of energy annually and reducing CO2 equivalent greenhouse gas emissions by 450,000 tonnes.

- Work starts on increasing capacity of Salt Lake Natural Gas Underground Storage project. It is reported that the EIA process of the third stage of the Tuz Gölü Natural Gas Underground Storage Capacity Expansion project being carried out by BOTAŞ has got underway. Once the work is complete, the capacity of the Salt Lake Natural Gas Underground Storage facility will be increased from 15 billion cubic meters to a total of 21.2 billion cubic meters.

- Three coal power plant projects cancelled in Türkiye in the third quarter of 2024. According to Global Energy Monitor's Global Coal Power Plant Tracker data, the only ongoing coal power plant project in Türkiye after the cancelled projects was the expansion of the 688 MW units of the Afşin-Elbistan power plant complex. At the same time, demand for new coal power plant proposals in OECD countries has fallen to record lows, with the number of coal power plants in this region falling by 96%, down from 142 in 2015. Of the 13 OECD countries with coal-fired power plant projects in 2015, all but Türkiye have committed to halting the construction of new coal-fired power plants since then.

- Türkiye's first domestic electrolyzer for green hydrogen production developed. It is reported that while the work to establish a Hydrogen Valley in Southern Marmara continues, Türkiye's first high-capacity domestic proton exchange membrane (PEM) type electrolyzer was developed by TÜBİTAK Marmara Research Center (MAM). The electrolyzer is reportedly capable of producing a minimum of 5 standard cubic meters of green hydrogen per hour.

- European Bank for Reconstruction and Development (EBRD) provides USD 42 million in financing to Fiba Renewable Energy Holding for the construction of solar power plants. The financing provided to Konsept Energy, owned by Fiba Renewable Energy Holding, will ensure the development and construction of 55 MW hybrid solar power plants in Isparta and a 20 MW plant in Balıkesir. According to a statement from the EBRD, once complete, the solar power plants will reduce carbon emissions in the electricity system by approximately 37,000 tonnes per year.

- EMRA leaves limit of being an eligible consumer in the natural gas market unchanged for 2025. Accordingly, in the natural gas market, the limit of being an eligible consumer for domestic consumers in 2025 will continue to be applied as 75,000 cubic meters.

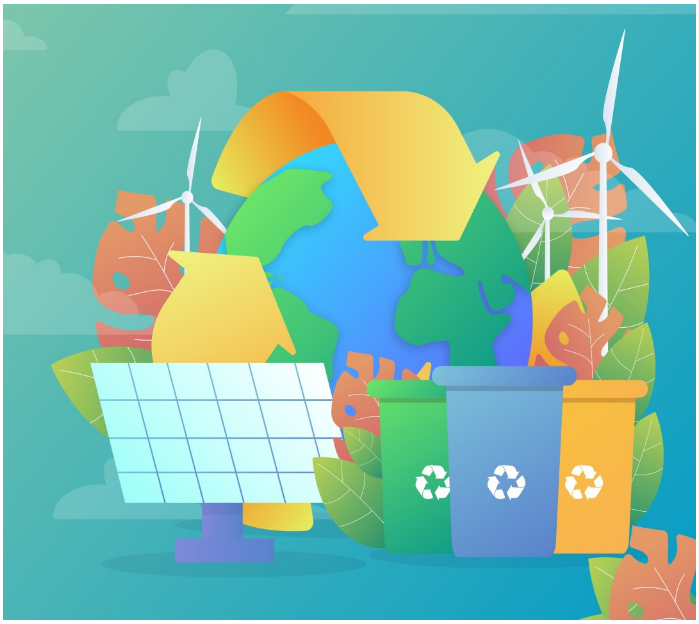
- EMRA determines construction periods to be taken as a reference in determining the facility completion dates with various license application fees in the electricity market. Accordingly, within the scope of the Electricity Market License Regulation, the minimum capital amount for legal entities applying for a supply license has been determined as TL 28 million and the capital amount for legal entities applying for a collector license determined as a minimum of TL 50 million. While EMRA also determined the construction periods to be taken as a reference in determining the pre-license periods and facility completion dates, the pre-license period was calculated as 24-26 months according to the installed capacity of the project. It has been reported that EMRA aims to initiate a transformation in the sector with the new decisions it has taken with the aim of strengthening consumer rights, effectively combating illegal electricity and digitalization in the energy market.

- EMRA publishes its "Electricity Market Sector Report" and "Natural Gas Market Sector Report" for October. Accordingly, electricity consumption in October increased by 3.7% compared to October 2023 to reach 27.3 TWh. Electricity consumption stood at 28.5 TWh in September. Billed electricity consumption decreased by 1.2% YoY to 22.1 TWh. On the other hand, natural gas consumption decreased by 0.02% compared to the same month of the previous year to 3.1 billion cubic meters (bcm), while 36.9% of the natural gas consumed was used by the industrial sector. Natural gas imports, on the other hand, increased by 17.6% compared to October 2023 to reach 3.9 bcm.

Foreign News

- China restricts exports of critical minerals in response to U.S. chip restrictions. With the restriction, the export of critical minerals such as germanium and antimony, as well as gallium, which is used in the production of batteries and fuel cells, is limited.

- Obligation for buyers of Russian natural gas to carry out payments to Gazprombank cancelled. With the amendment to the decree signed by Russian President Vladimir Putin on March 31, 2022, foreign companies will be able to carry out payments through third-party banks. The U.S. imposed sanctions on Gazprombank in November.



- 2024 to be the first full year in the United Kingdom (UK) where renewables generate more electricity than fossil fuels. According to Ember Climate's study, in addition to the closure of the last coal power plant in the country in 2024, the use of natural gas has also decreased by 13% compared to the previous year, while wind power is close to becoming the largest source of electricity. According to the study, electricity generated from wind, solar and hydroelectric power plants totalled 103 TWh, accounting for 37% of the electricity generated, while the rate of electricity generated from fossil fuel-based power plants was 35%. Wind energy, on the other hand, is expected to meet 29% of the total electricity generation with 82 TWh of generation, depending on year-end conditions.

- European Commission calls for two new supports for net-zero technologies totalling €4.6 billion. €3.4 billion of the calls for the European Union to achieve climate neutrality by 2050 aim to accelerate the deployment of innovative carbon technologies, including electric vehicle battery cell production, while €1.2 billion aims to increase the production of renewable hydrogen.

- Organization of the Petroleum Exporting Countries (OPEC) lowers its global oil growth forecast by 210,000 barrels per day for 2024 and 90,000 barrels per day for 2025. According to the Monthly Oil Market Report for December published by OPEC, the consumption growth forecast for 2024 was 1.6 million barrels per day, while the growth forecast for 2025 was reduced to 1.4 million barrels per day.

- Automotive manufacturer Stellantis and Chinese battery manufacturer CATL announce plans to invest EUR 4.1 billion in batteries in Spain. According to the statement issued by the companies, a mega factory will be established to produce batteries for electric vehicles with the investment to be carried out in Zaragoza, Spain, with the capacity of the facility potentially reaching 50 GWh.

- International Energy Agency (IEA) publishes its Oil Market Report for December. According to the report, global oil demand growth is expected to increase from 840,000 barrels per day in 2024 to 1.1 million barrels per day in 2025. The IEA predicts that consumption will reach 103.9 million barrels per day in 2025, highlighting the role of petrochemical feedstocks in oil demand. However, the report expects demand growth in China to slow in 2025, while developing Asian countries will be effective in steering demand.

- Google announces plans to invest USD 20 billion in renewable energy to meet the electricity needs of Artificial Intelligence centers. Google announced an agreement with Intersect Power and TPG Rise Climate for the investment, while the partnership aims to establish "gigawatts" of new data center capacity across the US.

- UK unveils its action plan for the new era of clean electricity. The action plan is intended to lay the foundation for an energy system for households and businesses that can permanently reduce bills. The priorities of the action plan include cleaning up dysfunctional grid systems, speeding up permitting decisions with the authority to prioritize critical energy infrastructure and expanding renewable energy auction processes. The UK government claims the action plan will ensure £40bn of private investment per year in domestic clean energy projects and infrastructure across the country.

- IEA publishes its report on "The Future of Geothermal Energy". According to the report, geothermal energy currently meets less than 1% of global energy demand and is concentrated in a few countries with high-quality resources, such as the United States, Iceland, Indonesia and Türkiye. The IEA states that with the increase in technology developments and reductions in project costs, geothermal energy will be able to meet 15% of the increase in global electricity demand by 2050. In addition, the report highlights that with new generation technologies, the technical potential of geothermal systems will increase and be able to meet global electricity demand 140 times over. The IEA emphasized that with policy and innovation support, the costs of geothermal projects could be reduced, placing geothermal energy as one of the cheapest distributable sources of low-emission electricity.

- IEA publishes its coal report for 2024. According to the report, coal demand is estimated to have increased by 1% in 2024 compared to the previous year and reach an all-time high of 7.77 billion tonnes. In the period to 2027, demand for coal is expected to stagnate, peaking at approximately 8.87 billion tonnes. The report highlights current policy and market trends, reflecting on the slow progress of the use of carbon capture, utilization and storage (CCUS) technologies in the sector, adding that carbon dioxide emissions from coal will not decrease for the same period. Although demand for coal in advanced economies is contracting, the IEA predicts that higher demand in emerging economies such as India, Indonesia and Vietnam will offset this decline.

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