# $8.7 billion coal subsidy contradicts Türkiye's renewable goals

Türkiye has committed to providing a purchase guarantee in dollars for domestic coal power plants by 2030. However, redirecting the $8.7 billion allocated for coal over four years to modernising the grid could enable new capacity for wind and solar investments and help to achieve the target of 120 GW of total installed wind and solar capacity by 2035. Furthermore, by removing barriers to rooftop, floating, hybrid, and storage-integrated solar projects, the energy transition could be accelerated without compromising supply security.

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# Contents


**About** **2**

**Executive summary** **4**

**Chapter 1 | $8.7 billion support pledged for domestic coal until 2030** **7**

1.1 Purchase guarantee 12% higher than market prices 7

1.2 Coal power plants get paid even when they're not generating 9

**Chapter 2 | Generating electricity from solar is 21% cheaper than from domestic coal** **10**

2.1 The cost of generating electricity from domestic coal averages $55 10

2.2 Solar generation costs down 69% in a decade 12

2.3 YEKA tender purchase guarantees are lower than coal incentives 14

**Chapter 3 | Achieving the 2035 targets is possible through grid upgrades and diverse solar power plant applications** **16**

3.1 Coal gets $8.7 Billion boost that 53% more than 5-year grid upgrade budget 16

3.2 The key to energy transition: rooftop solar, floating solar, hybrid solar and storage-integrated projects 17

**Supporting materials** **19**

Methodology 19

Acknowledgement 22

# About

This report evaluates the incentive price to be provided to domestic coal power plants until 2030 based on the plants' electricity generation costs and sales prices. Furthermore, the electricity generation costs of existing domestic coal power plants have been compared with the costs of new solar and wind power plants to be established, based on the results of YEKA tenders. The report highlights Türkiye's solar energy potential and the areas that need to be focused on in order to achieve its 2035 targets.

Executive summary

# Despite the drop on solar costs, Türkiye bets on coal incentives

**Over the past decade, with a 77% reduction in installation costs, electricity generation from solar energy has become cheaper than domestic coal. In contrast, Türkiye prefers to promote domestic coal power plants by 2030. However, by directing its resources towards renewing the grid and removing bureaucratic barriers to different solar energy projects such as rooftop, floating and hybrid, Türkiye could reach its total target of 120 GW of wind and solar energy by 2035.**

Over the past decade, the installation cost of wind power plants has fallen by 40%, while the installation cost of solar power plants has fallen by 77%. This decline has reduced the cost of electricity generation from solar energy by 69%, making solar energy Türkiye's cheapest source of electricity generation. Despite falling renewable costs, Türkiye has decided to provide incentives in USD for domestic coal power plants, despite their expenses being in TRY. The $75 USD/MWh incentive price is 12% above the average sales price ($67 USD/MWh) over the past year and 36% above electricity generation cost of domestic coal power plants ($55 USD/MWh). With this incentive, domestic coal power plants, whose costs are subsidized under the capacity mechanism even if they do not generate electricity, will receive a total of at least $8.7 billion over a four-year period. This amount is 53% higher than the five-year grid renewal budget, which has become an obstacle to new power plant investments due to limited capacity.

Türkiye could remove the barrier to new power plant investments by allocating the budget planned for coal subsidies, to grid modernisation and the construction of new substations. Furthermore, by removing bureaucratic barriers to the integration of rooftop, floating, hybrid, and storage-integrated solar projects into the system, Türkiye could accelerate the energy transition and achieve its target of reaching 77 GW of installed solar capacity by 2035.

01 **It has been announced that a purchase guarantee of $75 USD/MWh will be provided for domestic coal power plants through 2030**

With this price guarantee, the electricity sale price of power plants will increase by 12% compared to the average sale price over the last year.

02 **The cost of generating electricity in existing domestic coal power plants ranges between $32 and $86 USD/MWh**

At a new domestic coal power plant, this cost rises to $90 USD/MWh. This figure is 109% higher than the unit cost of electricity generation from a newly built solar power plant ($43 USD/MWh).

03 **During the four-year incentive period, $8.7 billion will be paid to power plants generating electricity from domestic coal**

This is 53% more than the budget allocated for the renewal of the grid in Türkiye over five years.

04 **Over the past decade, solar installation costs in Türkiye have fallen by 69%**

With the unit cost of electricity generation falling to $43 USD/MWh by 2025, solar has become the cheapest source of electricity generation.

05 **The purchase guarantee prices in the wind and solar tenders held in 2025 were less than half the price provided for domestic coal**

In addition, investors paid the state $220 million for the total 2 GW of capacity auctioned.

Although Türkiye has made significant progress in electricity generation from solar energy, there is still a long way to go before the country can fully realise its potential. In a time when access to finance has become increasingly difficult, it is crucial for Türkiye to focus its resources and efforts not on supporting coal, but on removing bureaucratic barriers to renewable energy investments, strengthening grid infrastructure, and supporting new technologies. With these steps, Türkiye can meet its energy needs securely while also achieving its 2035 targets.

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Energy Analyst, Ember

Chapter 1

# $8.7 billion support pledged for domestic coal until 2030

**Since 2018, the costs of domestic coal power plants have been covered at a certain rate under the capacity mechanism. Although the costs of these plants are in Turkish lira, it has been announced that a purchase guarantee in US dollars will be provided until 2030. Power plants whose costs continue to be covered under the existing capacity mechanism will, with the new incentive, sell the electricity they generate at a price 12% higher than the average electricity sales price over the past year.**

## 1.1 Purchase guarantee 12% higher than market prices

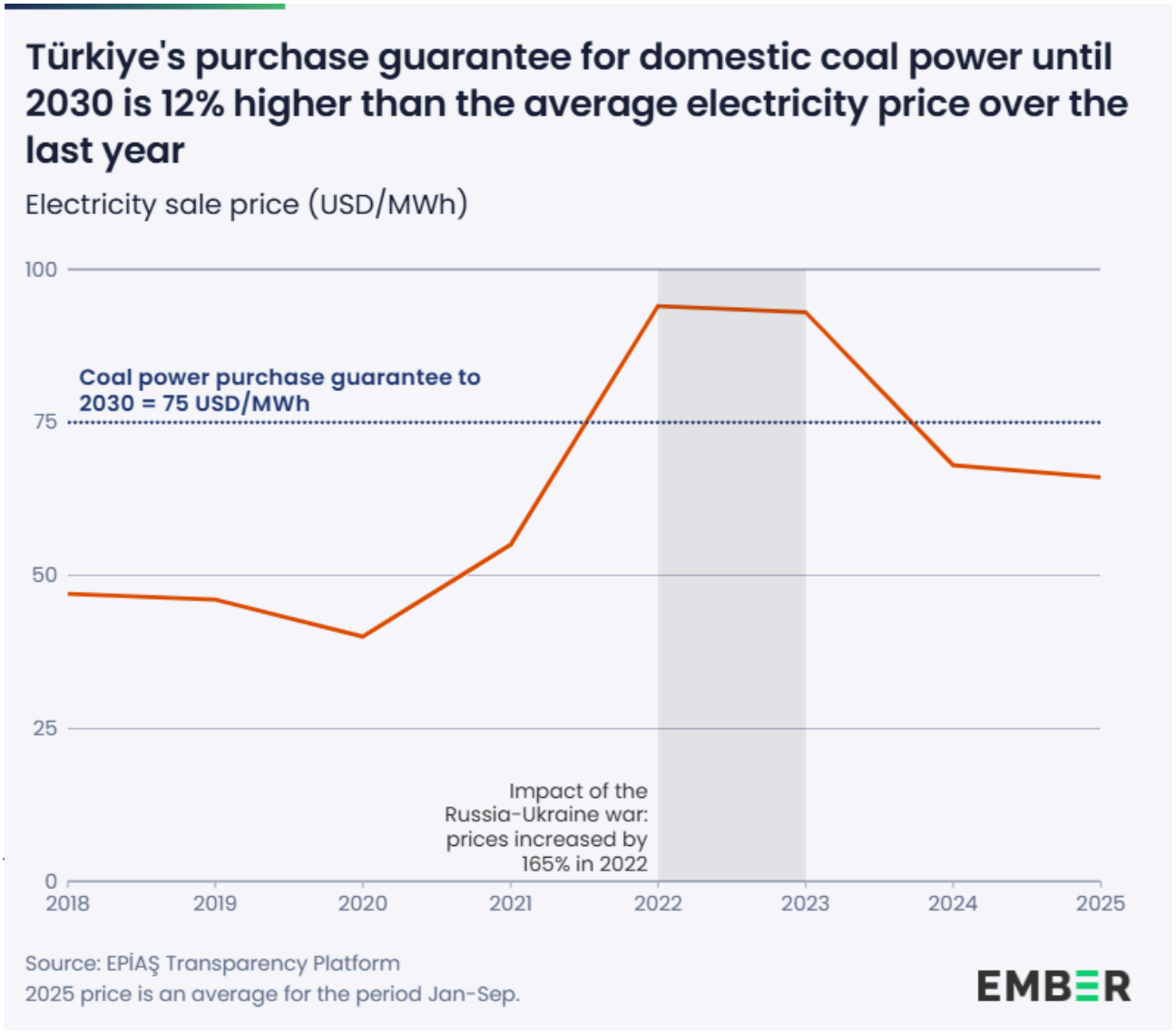
The government announced that power plants generating electricity from domestic coal, whose costs such as fuel, personnel, system usage, and transportation are in Turkish lira, will receive a purchase guarantee of $75 USD/MWh for 60% of their electricity generation until 2030. If the announced purchase guarantee begins in 2026, there will be a four-year implementation period until 2030.

Without the incentive, domestic coal power plants sell the electricity at Market Clearing Price (MCP). Following the Ukraine–Russia war, the prices of fuels used in electricity generation, such as imported coal and gas, increased sharply, causing the MCP to rise by 1.65 times in 2022 compared to the previous year.

Due to the impact of the crisis, electricity sales prices were capped for all sources during the period from April 2022 to September 2023.

Excluding the period when sales prices were capped, the average MCP between 2018 and 2025 period was $56 USD/MWh, while it was $67 USD/MWh over the past year. With the purchase guarantee set at $75 USD/MWh, the electricity sales price of domestic coal power plants will increase by 34% compared to the 2018–2025 period average and by 12% compared to the average over the past year. The $75 USD/MWh purchase guarantee to be applied to power plants for four years is estimated to cost $8.7 billion.

The statement also noted that power plants using a mix of domestic and imported coal would be eligible for the incentive. Even if power plants using imported coal source just 10% of their annual generation from domestic coal, the total support amount will increase by $1.2 billion, reaching $9.8 billion.



## 1.2 Coal power plants get paid even when they're not generating

Domestic coal power plants have also received payments under the capacity mechanism since 2018 to ensure long-term system and supply security. The total budget determined each year is distributed according to the installed capacity and capacity factor rates of the power plants. For each energy source covered by the capacity mechanism, fixed costs –unrelated to electricity generation– and variable costs –tied to electricity generation– are determined. The determined costs are updated monthly based on changes in the exchange rate, inflation, and transmission fees. The fixed costs of power plants are compensated when the MCP is below or equal to their variable costs. When the MCP exceeds the variable cost but remains below the total cost, they are compensated for the difference between the total cost and the MCP, even if they are not generating electricity.

Over the past year, a total of 7 billion TL ($188 million) has been paid to power plants under the capacity mechanism. When the costs in Turkish lira published by Turkish Electricity Transmission Corporation (TEİAŞ) in August 2025 are converted using the dollar exchange rate for the same month, the total cost determined for domestic coal power plants is approximately $59 USD/MWh. The purchase guarantee of $75 USD/MWh set to be applied to power plants until 2030 is 27% higher than the total cost determined by TEİAŞ.

The National Energy Plan published in 2022 projects that the capacity mechanism will continue until 2035. Although the details of the incentives to be provided until 2030 have not yet been announced, if the current support conditions continue, domestic coal power plants will sell 60% of their electricity generation at $75 USD/MWh, and their fixed and variable costs will be covered regardless of whether they generate electricity or not.

Chapter 2

# Generating electricity from solar is 21% cheaper than from domestic coal

**With installation costs falling by 77% over the last decade, solar has become the cheapest source of electricity generation. Electricity from a newly built solar plant is also 52% cheaper than from a new domestic coal plant.**

## 2.1 The cost of generating electricity from domestic coal averages $55

The cost of electricity generation in coal power plants depends on coal prices, coal's calorific value, and plant efficiency. As efficiency and calorific value increase, the cost of electricity generation decreases, while as the price of coal used in electricity generation increases, costs also rise. The calorific value of Türkiye's lignite coal varies between 1,100 and 4,200 kcal/kg, but 79% of its reserves are below 2,500 kcal/kg. Calculations based on TEİAŞ data, the average calorific value of coal used in electricity generation is 1,650 kcal/kg. The efficiency of power plants using domestic coal in electricity generation varies between 23% and 41%. Again, according to TEİAŞ data, the average power plant efficiency is 32%.

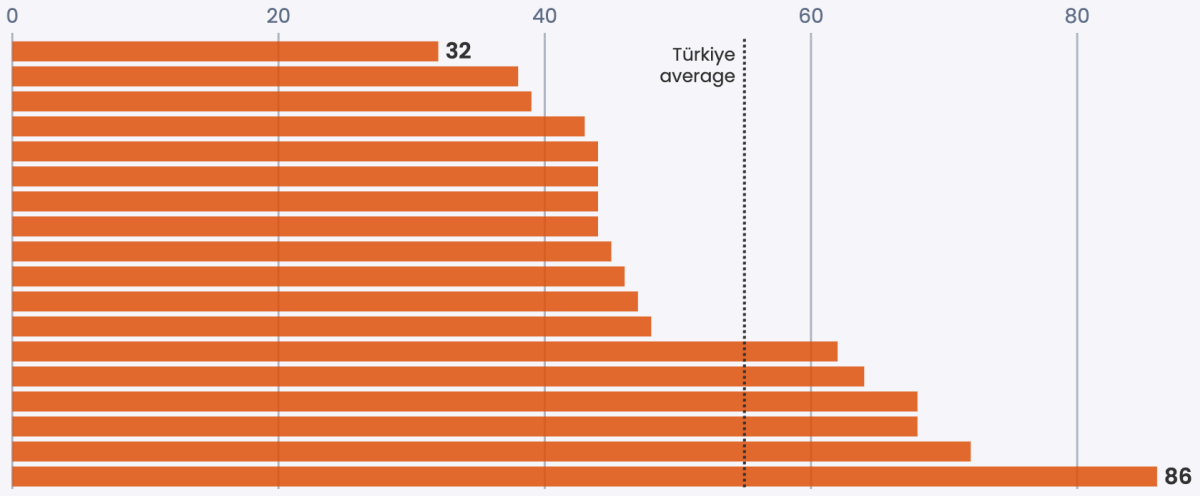
The price of coal varies depending on whether it is extracted from an open-pit mine or an underground mine. The mining sites operated by the Turkish Coal Enterprises (TKI) are classified as open-pit mines. Given that it is a state-owned enterprise and the mining areas are open-pit mines, the coal sales price applied by TKI to power plants can be considered the lowest coal price. Based on the coal sales price applied by TKI to power plants in 2024 and the inflation data published by the Turkish Statistical Institute (TURKSTAT), the price of coal used in domestic coal power plants — excluding transportation costs to the plant — is estimated to be approximately 1,100 TL per ton as of September 2025. Based on this price, and assuming an average calorific value of 1,650 kcal/kg and an average efficiency of 32%, the average unit cost of electricity generation in domestic coal power plants is calculated to be $53 USD/MWh.

The cost of transporting coal from the mine to the power plant varies depending on whether conveyor belts, road or rail transport is used. If the transport cost is assumed to be 5% of the sales price, the average electricity generation cost increases by approximately 2 USD and will be $55 USD/MWh.

According to TKI, Mineral Research and Exploration General Directorate (MTA) data and literature research (See: Methodology), the lowest calorific value of coal used for electricity generation in power plants is 1,100 kcal/kg, and the efficiency of this power plant is stated as 28%. Based on these values, calculations show that the power plant's electricity generation cost rises to $86 USD/MWh, making it the most expensive coal power plant in Türkiye. On the other hand, the coal used in the plant operating at the highest efficiency (42%) has an average calorific value of 2,500 kcal/kg. This plant, with an electricity generation cost of $32 USD/MWh, is the lowest-cost plant among those operating with domestic coal.

**In Türkiye, the unit cost of electricity generation from domestic coal ranges between 32 and 86 USD/MWh**

Unit electricity generation cost, per power plant (USD/MWh)




Source: TEİAŞ calorific value and fuel consumption data; TKİ 2024 Annual Report; MTA provincial mineral potential reports; TurkStat inflation data; and academic publications

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## 2.2 Solar generation costs down 69% in a decade

Government policies supporting renewable energy investments globally have driven up sector demand and research and development funding. This, in turn, has led to technological improvements and lower costs in renewable power generation. As a result, over the past decade, the installation costs of new wind power plants in Türkiye have decreased by 40%, while those of solar power plants have fallen by 77%.

The decrease in installation costs also leads to a reduction in the lifetime electricity generation costs of power plants. The Levelised Cost of Electricity (LCOE) is an indicator used to calculate the present value of the unit cost of electricity that power plants will generate over their lifetime. The LCOE, which is calculated by dividing all the costs incurred by the power plant throughout its

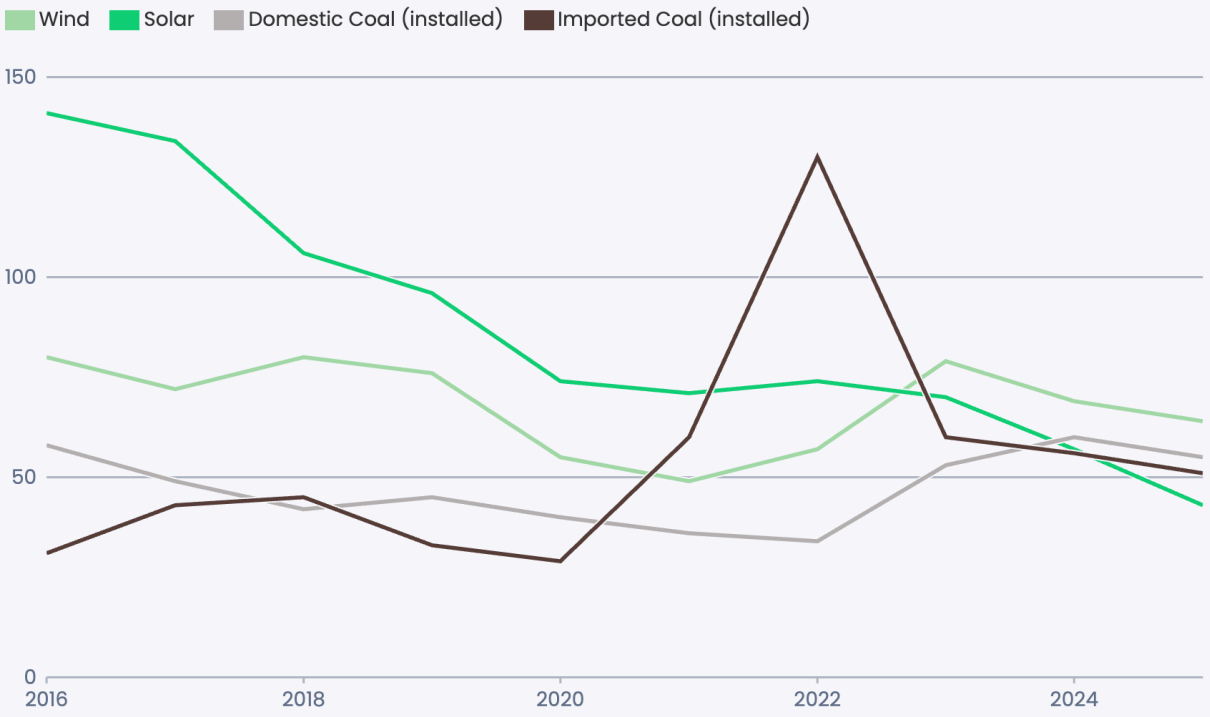
economic life, such as installation, operation and maintenance, by the amount of electricity it will generate, allows the unit costs of electricity generated from different sources to be compared.

Thanks to the decline in installation costs, the LCOE of new solar power plants to be established in Türkiye has fallen by 69% over the last decade to $43 USD/MWh (See: Methodology), while the LCOE of wind power plants has fallen by 20% to $64 USD/MWh. With this decline, the electricity generation cost of new solar power plants has fallen 15% below that of existing imported coal power plants and 21% below that of existing domestic coal power plants. As a result, as of 2025, solar energy has become the cheapest source of electricity generation in Türkiye.

Türkiye's published National Energy Plan (NEP) states that new domestic coal power plants with a capacity of 1.7 GW will be added to the system by 2030. In line with the NEP, a parallel statement commits to providing purchase guarantees through 2045 for new power plants replacing domestic coal power plants that are nearing economic obsolescence. Under the current economic conditions, if a 1.5 GW coal power plant that has reached the end of its economic lifetime were to be replaced with a new one of the same capacity, the LCOE of the new plant would be approximately $90 USD/MWh (See: Methodology). This is more than twice the electricity generation cost of a newly built solar power plant ($43 USD/MWh).

**In Türkiye, solar power generation costs have fallen 69% over the last decade, now below those of existing coal plants**

Unit electricity generation costs by source (USD/MWh)




Source: IRENA - Renewable Power Generation Costs in 2024, Turkish Coal Enterprises 2024 Annual Report, API2 coal price, and Ember calculations.
- The values calculated for coal power plants represent the costs of plants with average thermal efficiency and calorific value.

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## 2.3 YEKA tender purchase guarantees are lower than coal incentives

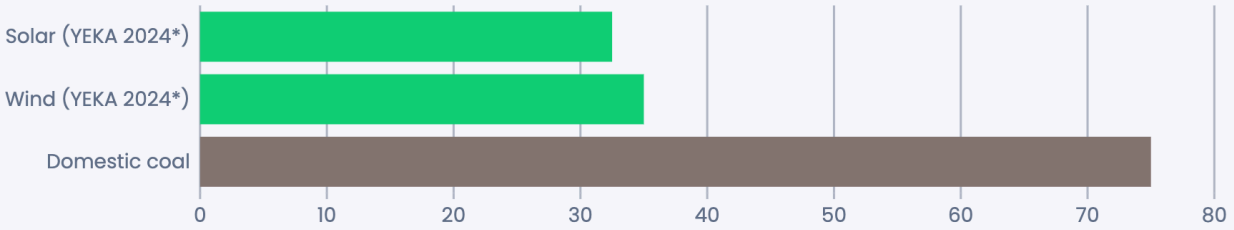
In Türkiye, the YEKA tender was developed to implement large-scale solar and wind energy projects, promote domestic manufacturing of technology, and increase the qualified workforce. The first tender under this model was held in 2017. The latest tender was held at the beginning of 2025 for 1.2 GW of wind and 0.8 GW of solar capacity.

The purchase guarantee ceiling price applicable to both types of sources in tenders is set at $55 USD/MWh, while the minimum price is set at $32.5 USD/MWh for solar energy projects and $35 USD/MWh for wind projects. In cases where the bids reached the minimum price, the companies offering the highest contribution fee per MW were awarded the tenders.

According to the tender results, the minimum price set for both types of sources has been reached; the weighted average of the contribution fee offered by the winning companies per MW was $100,000 for wind projects and $126,000 for solar projects. Thus, the purchase price to be applied to wind and solar power plants has been set at less than half of the price provided to domestic coal power plants ($75 USD/MWh) until 2030, and companies have committed to pay a total contribution of $220 million to the state.

**The purchase price applied to wind and solar power is less than half of the price guaranteed for domestic coal**

Electricity purchase guarantee price (USD/MWh)




Source: YEKA 2024 tender results and press release
*YEKA is a tender model implemented to develop large-scale solar and wind energy projects.

Chapter 3

# Achieving the 2035 targets is possible through grid upgrades and diverse solar power plant applications

**It does not appear feasible for Türkiye to achieve its total installed capacity target of 120 GW of wind and solar energy by 2035 without upgrading the electricity grid and removing bureaucratic barriers to various solar energy projects. The energy transition can only be accelerated by making efficient use of existing financing opportunities.**

## 3.1 Coal gets $8.7 Billion boost that 53% more than 5-year grid upgrade budget

Türkiye targets 120 GW total installed capacity in solar and wind energy by 2035. The statement emphasises that strengthening and modernising the grid is necessary to achieve this target.

For unlicensed power plants, which account for 90% of Türkiye's installed solar capacity and are established to meet self-consumption needs, the transmission grid hit capacity limits in September 2024, distribution followed in July 2025. TEİAŞ plans to spend ₺362 billion (approximately $5.7 billion) for grid upgrades over

the five-year period regarding its 2024–2028 Strategic Plan. The same plan highlights that one of the most important factors affecting the institution's activities is the negative impact of economic conditions on contracts signed with contractors. Indeed, for this reason, contractor companies have faced penalties such as exclusion from future tenders.

The $8.7 billion to be spent on supporting domestic coal power plants until 2030 is 53% more than the entire five-year grid renewal budget. Directing the resources allocated to coal subsidies towards the modernisation of the transmission and distribution grid and the construction of new substations will accelerate the achievement of the 2035 targets.

## 3.2 The key to energy transition: rooftop solar, floating solar, hybrid solar and storage-integrated projects

As of September 2025, the installed solar energy capacity stands at 24.1 GW. By realising the potential of installing floating and hybrid solar power plants at dammed hydroelectric power plants in Türkiye, the country can significantly increase its installed solar capacity. This would also help Türkiye to meet the base load demand and provide the grid balancing currently expected from domestic coal power plants.

Dammed hydroelectric power plants naturally store water, allowing flexible generation depending on the needs of the grid. By installing solar power plants alongside dammed hydroelectric power plants, daytime electricity demand can be met through solar generation, while the hydroelectric power plants can help maintain system balance during potential load drops. In the evening hours, the water stored during the day can then be used for electricity generation.

In regions where the installed capacity of dammed hydroelectric power plants is low, base load and grid balancing can be achieved with storage-integrated

projects. Türkiye has a total stock of 33.1 GW of storage-integrated solar and wind projects. Projects with storage are considered an effective tool for maintaining the frequency and voltage balance of the electricity grid. However, despite these characteristics, the maximum price policy applied to market prices in Türkiye is one of the biggest obstacles to the implementation of new investments.

In a scenario where the maximum price policy continues, incentives for domestic coal power plants could be directed towards storage-integrated solar and wind projects in order to benefit from their ability to maintain system balance.

One of Türkiye's most significant potentials is its 120 GW rooftop solar power systems. Due to the increasing demand for cooling in recent years, partly driven by climate change, consumption rises by an average of 770 MWh for every 1°C increase in temperature. Solar energy can meet 21% of consumption during peak cooling demand hours. By removing bureaucratic barriers to rooftop solar installations and simplifying investment procedures, Türkiye can rapidly increase rooftop solar capacity, enabling on-site consumption and thereby reducing the load on the grid.

Türkiye aims to reach 76.9 GW of installed solar energy capacity by 2035. To achieve this target, an average of 5.3 GW must be installed each year over the remaining 10 years. However, due to capacity constraints in the grid, Türkiye must realise its potential in different solar energy projects to reach this target. Rather than promoting domestic coal, removing the bureaucratic obstacles to these projects and providing the necessary investment environment will accelerate the energy transition.

Supporting materials

# Methodology

### The unit cost of electricity generation from domestic coal power plants

For the calorific value of the coal used in the power plants, data were obtained from the 2024 annual report of the Turkish Coal Enterprises (TKI), the "Provincial Mineral Potentials" dataset published by the General Directorate of Mineral Research and Exploration (MTA), the official websites of the power plants, and the annual reports of publicly listed companies. For the efficiency values used in the calculations, sources included the 2009 report published by an eight-member research team that included Prof. Dr. Hasan Hüseyin Erdem, data from the official websites and investor presentations of the plants, as well as the 2011 article prepared by Muzaffer Başaran, former Deputy General Manager of EÜAŞ and Board Member of the World Energy Council.

The average calorific value of the coal used in electricity generation by domestic coal power plants and the average plant efficiency were calculated using data from Turkish Electricity Transmission Corporation's (TEİAŞ) Electricity Statistics. Within this scope, the fuel consumption and calorific value data of lignite power plants were obtained to calculate the average kcal/kg value.

The annual total electricity generation (MWh) of lignite power plants was converted to kilocalories using a coefficient of 860,421; then, the calculated total kcal value was divided by the total fuel calorific value listed in the TEİAŞ data for the power plants to determine the average efficiency.

To calculate the coal price used in coal power plants, the total sales revenue to power plants reported in the 2024 Annual Report of the Turkish Coal Enterprises (TKI) was divided by the total sales quantity stated in the same report, yielding the unit sales price. This value was then updated to September 2025 prices by multiplying it with the inflation rate calculated for coal and lignite production based on the Producer Price Index (PPI) data by industry, as published by the Turkish Statistical Institute (TURKSTAT).

In calculating the unit cost of coal power plants, the system usage fee (including annual value), along with the fixed and system operation fees applied by TEİAŞ for 2025, were divided by the average USD/TRY exchange rate for 2025 and taken as $4.19 USD/MWh. The operation and maintenance cost was derived from the 2024 report of the Turkish Coal Producers Association (KOMURDER) and assumed to be $4.71 USD/MWh.

### The total purchase guarantee amount to be provided for domestic coal over the four-year period

In calculating the amount of subsidy to be provided to coal power plants, the electricity generation of plants using domestic coal between 2020 and 2024 was multiplied by 60%, and a purchase guarantee price of $75 USD/MWh was applied to this amount.

### Levelised Cost of Electricity (LCOE) Calculations

The changes in installation costs of wind and solar power plants over the past decade were derived from the report published by the International Renewable Energy Agency (IRENA).

In the LCOE calculation, for solar power plants, an investment cost of $420,000 USD per MW, including operation and maintenance expenses, a DC/AC ratio of 1.2, and a capacity factor of 18% were assumed. For wind power plants, an investment cost of 1.4 million USD per MW and a capacity factor of 33% were

used. For both sources, a plant lifetime of 25 years, an exchange rate of $41.2 USD/TRY, and a WACC of 8% were assumed. The annual degradation rate was taken as 0.5% for both power plants.

In the LCOE calculation of a new 1.5 GW coal power plant, it was assumed that the plant would consist of five units of 300 MW each. The unit cost was calculated by applying a correction factor of 1.4 to the unit price of a 1,100 MW plant reported by KOMURDER; in addition, as recommended in the same report, a 12.5% discount was applied for the remaining four units. The plant's efficiency was assumed to be 42%, self-consumption rate 10%, capacity factor 80%, calorific value 1,100 kcal/kg, coal price $28 USD/ton, and annual degradation rate 0.3%. The USD/TRY exchange rate (41.2) and WACC (8%) were kept consistent with those used for other sources.

# Acknowledgement


## Contributors

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## Cover image

Panoramic view of an open-pit coal mine in Türkiye, showing excavation areas and surrounding mountain landscape.

Credit: canerozkan / Getty Images Plus


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