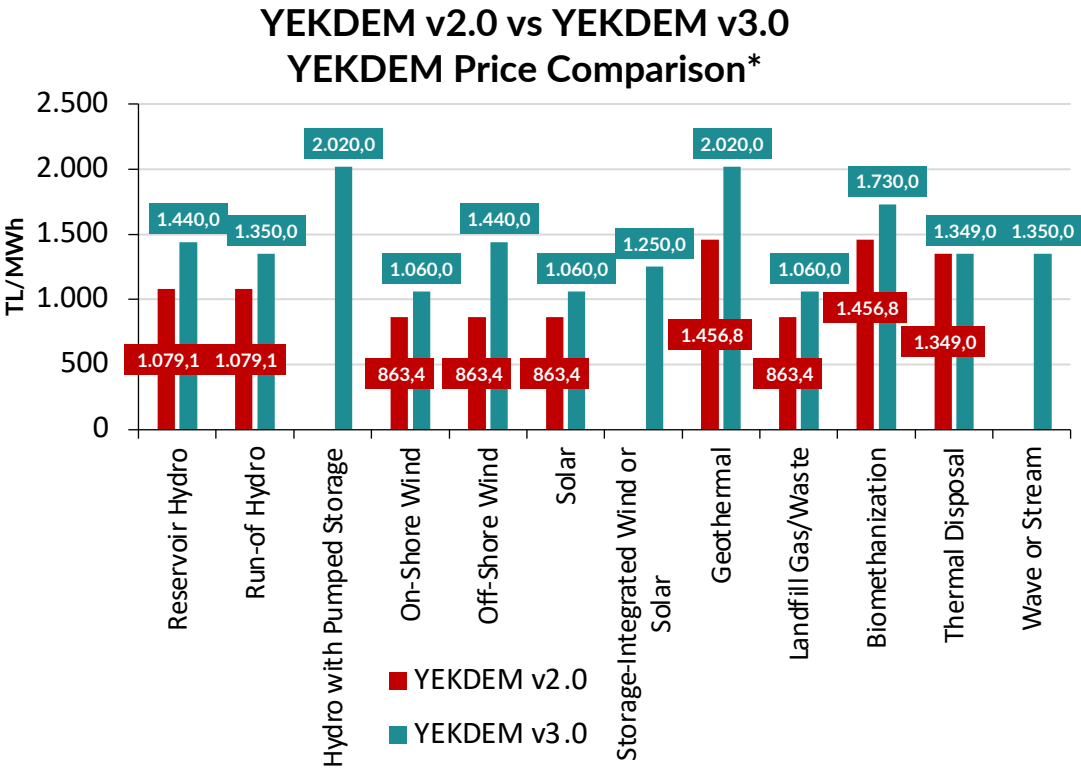


2023 Renewable Energy Source Support Mechanism (YEKDEM v3.0) Update Information Note

- > New **YEKDEM Prices** and **implementation periods** concerning the renewable energy source (YEK) certified renewable energy sourced facilities which are or to be commissioned between **01/07/2021** and **31/12/2030** have been identified according to the Presidential Decree no. 7189, published in the Official Gazette dated 1 May 2023.
- > The published decision includes updates regarding the previous Renewable Energy Source Support Mechanism (YEKDEM) implementation.
 - 1 Within the scope of YEKDEM v3.0, YEKDEM Prices and Local Component Support Prices have been updated in regard to the previous YEKDEM regulation (YEKDEM v2.0) and there have been significant **increases** in YEKDEM Prices.
 - 2 The foreign currency weight in the escalation methodology used in YEKDEM Price calculations increased from **48% to 60%** while the weight of PPI and CPI **decreased from 52% to 40%**. Additionally, the YEKDEM and Local Component Support Prices will no longer be calculated for 3 (three) monthly periods, but for each month.
 - 3 Differing from the previous YEKDEM regulation, **YEKDEM floor prices** are also stated in **USD-Cent/kWh** terms, based on facility types.
 - 4 Several new types of renewable energy sources have been differentiated under the new mechanism. These include offshore wind facilities, wind or solar energy integrated electricity storage facilities, hydroelectric facilities with pumped storage and generation facilities based on tidal energy sources.
 - 5 The implementation period of the YEKDEM prices has been determined as **15 years** for geothermal plants and hydroelectric facilities with pumped storage and **10 years** for other facilities.
 - 6 The implementation period of the Local Component Support Prices has been determined as **5 years** for hydroelectric, wind, geothermal, biomass and solar sourced facilities and **10 years** for storage-integrated wind or solar facilities, hydroelectricity plants with pumped storage and wave or stream energy-based generation facilities.
 - 7 YEKDEM and Local Component Support Prices **will not be** applicable for storage – integrated wind or solar power plants for the stored electricity **drawn from the grid**. The applicable purchase guarantee will **only be valid** for renewable energy generation.
 - 8 YEKDEM and Local Component Support Prices determined for thermal disposal-based biomass facilities will be applied to facilities that have obtained pre-license until the decision date (**May 1, 2023**). Facilities that have obtained pre-license **after** this decision date **will not be able to benefit** from YEKDEM and Local Component Support Prices.

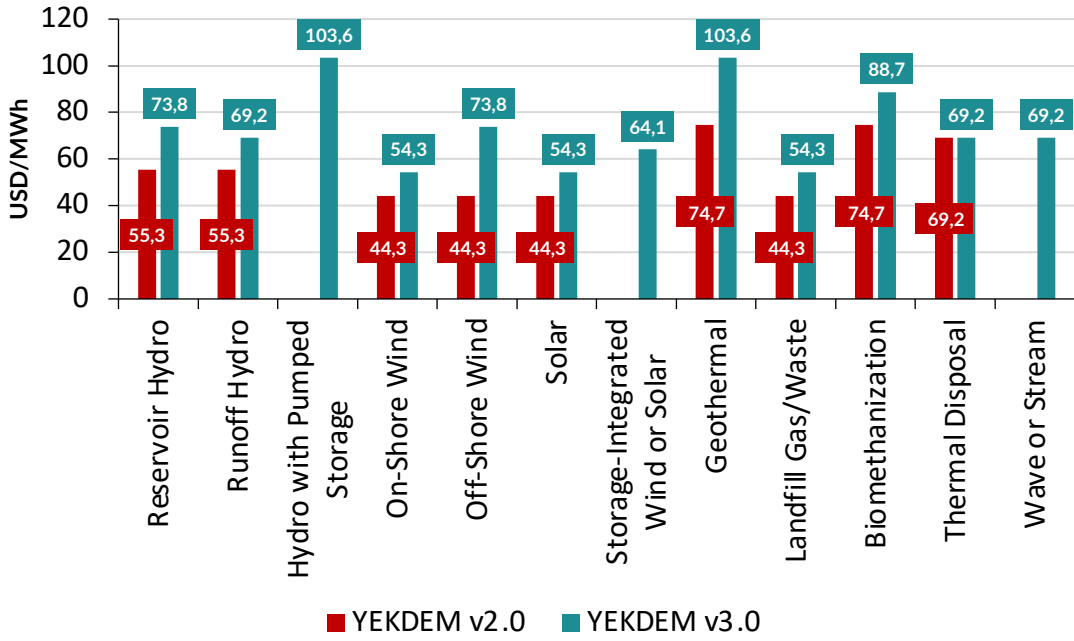
YEKDEM v3.0 and Local Component Support Prices

Renewable Energy Sourced Facility Type		YEKDEM Price (TL /MWh)	YEKDEM Floor – Ceiling Price (USD /MWh)	Local Component Support Price (TL /MWh)
Hydro	Reservoir	1,440.0	67.5 – 82.5	288.0
	Runoff	1,350.0	63.0 – 77.0	288.0
Wind	On-shore	1,060.0	49.5 – 60.5	288.0
	Off-Shore	1,440.0	67.5 – 82.5	384.5
Biomass	Landfill Gas/Waste	1,060.0	49.5 – 60.5	288.0
	Biomethanization	1,730.0	81.8 – 99.0	288.0
	Thermal Disposal	1,349.0	57.5 – 80.0	215.8
Geothermal		2,020.0	94.5 – 115.5	288.0
Solar		1,060.0	49.5 – 60.5	288.0
Storage-Integrated Wind or Solar		1,250.0	58.5 – 71.5	384.5
Hydro with Pumped Storage		2,020.0	94.5 – 115.5	384.5
Wave or Stream		1,350.0	63.0 – 77.0	384.5



- > **Hydroelectric facilities with pumped storage**, being separately priced for the first time, and **geothermal facilities** has the **highest** YEKDEM Price with **2,020 TL/MWh**, while on-shore wind and solar power plants has the **lowest** YEKDEM with **1,060 TL/MWh** under the new YEKDEM v3.0.
- > When YEKDEM v2.0 and v3.0 prices are compared, YEKDEM Prices concerning the geothermal facilities has experienced the highest increase with **39%** from **1,456.8 TL/MWh** to **2,020 TL/MWh**.
- > YEKDEM Prices for reservoir and run-of hydroelectric power plants, receiving 1,079 TL/MWh with regardless of facility type under YEKDEM v2.0, increased by **33%** and **25%**, respectively, to **1,440 TL/MWh** and **1,350 TL/MWh**.

YEKDEM v2.0 vs YEKDEM v3.0 YEKDEM Price Comparison*



- > Within the scope of YEKDEM v3.0, hydroelectric power plants with pumped storage and geothermal plants has the highest YEKDEM Price with **103.6 USD/MWh**, while on-shore wind and solar facilities has the lowest YEKDEM Price with **54.3 USD/MWh**.
- > Compared to YEKDEM v2.0, YEKDEM Prices within the scope of YEKDEM v3.0 have increased by an average of **28%** and **15.0 USD/MWh** (excluding first-time entrants).

Modifications in the YEKDEM Escalation Formula

$$YEKDEM_{GD} = YEKDEM_{\ddot{O}GD} \times \left[\left(\frac{26}{100} \times \frac{\ddot{U}FE_{A-2}}{\ddot{U}FE_{A-5}} \right) + \left(\frac{26}{100} \times \frac{T\ddot{U}FE_{A-2}}{T\ddot{U}FE_{A-5}} \right) + \left(\frac{24}{100} \times \frac{KUR_{D-A}}{KUR_{D-B}} \right) + \left(\frac{24}{100} \times \frac{KUR_{E-A}}{KUR_{E-B}} \right) \right]$$

$$YEKDEM_{GD} = YEKDEM_{\ddot{O}GD} \times \left[\left(\frac{25}{100} \times \frac{\ddot{U}FE_{A-2}}{\ddot{U}FE_{A-3}} \right) + \left(\frac{15}{100} \times \frac{T\ddot{U}FE_{A-2}}{T\ddot{U}FE_{A-3}} \right) + \left(\frac{30}{100} \times \frac{KUR_{D-1}}{KUR_{D-2}} \right) + \left(\frac{30}{100} \times \frac{KUR_{E-1}}{KUR_{E-2}} \right) \right]$$

- > Within the scope of YEKDEM v3.0;
- > The escalation of Local Component Support Prices will be realized via the same methodology and equation as the YEKDEM Prices.
- > New terms symbolizing the;
 - > PPI and CPI of the 2nd month prior to effective month ($\ddot{U}FE_{A-2}$ ve $T\ddot{U}FE_{A-2}$)
 - > PPI and CPI of 3rd month prior to effective month ($\ddot{U}FE_{A-3}$ ve $T\ddot{U}FE_{A-3}$)
 - > Average of CBRT USD buying rates in the previous month (KUR_{D-1})
 - > Average of CBRT EUR buying rates in the previous month (KUR_{E-1})
 - > Average of CBRT USD buying rates in the 2nd month prior to effective month (KUR_{D-2})
 - > Average of CBRT EUR buying rates in the 2nd month prior to effective month (KUR_{E-2})
 have been **added** into the escalation equation.



APLUS Enerji Comments



In recent years, the expiration of the USD-based Renewable Energy Resource Support Mechanism (YEKDEM v1.0) purchase guarantee has created a gap in the available **renewable energy investment models** in the market. This situation has caused **investments to slow down significantly** and occasionally led to various **risks related to electricity supply security**. Investors and financing institutions have shown little interest in the new TL-based Renewable Energy Resource Support Mechanism (YEKDEM v2.0) announced in 2021 due to the **low purchase guarantee** and **foreign exchange risk**. As a result, licensed wind and solar energy investments have mainly been limited to the **Renewable Energy Resource Areas (YEKA) framework** during this period. However, various issues encountered in YEKA tenders have also caused delays and slowdowns in these investments. Although some partial improvements have been made towards accelerating renewable energy investments with the introduction of new models concerning **battery storage integrated wind and solar power plant** investments and certain modifications in the **structure of Renewable Energy Resource Areas (YEKA) tenders** in 2022, the investments have not yet reached the desired levels. As of May 1, 2023, with the introduction of the new update (YEKDEM v3.0), a positive step has been taken towards **eliminating the issues** that APLUS Enerji has been focusing on for the past two years.

- > Despite the fact that the newly determined price levels have remained slightly below the market expectations for certain sources such as wind energy, **the boost observed in the levels of base purchase guarantees** will play an essential role in enhancing the appeal of new investments across all sources.
- > Another beneficial change is the **increase in the percentile weight of foreign exchange rates in the escalation formula used for the purchase guarantee calculation, which has been raised from 48% to 60%**. With this alteration, **the foreign exchange risk for the power plants to be commissioned under the scope of YEKDEM is significantly reduced**. Less exposure to exchange rate risk will increase the feasibility of new projects and provide opportunities for accessing financing under better conditions.
- > Another change targeting the reduction of foreign exchange risk for new projects is the **shift from quarterly to monthly escalation to be applied on purchase guarantee prices**. This change will shelter these projects against potential monthly currency and inflation shocks.
- > Additionally, **the application of a floor price in USD terms as a new practice** will provide an additional guarantee for various types of renewable energy projects and minimize the impacts of potential risks associated with macroeconomic developments.
- > The emergence of differentiated purchase guarantees for new sources such as off-shore wind, pumped-storage hydroelectricity, and storage-integrated wind/solar plants will also contribute significantly to the future of the electricity market. In this context, off-shore wind facilities will make worthy contributions in increasing renewable energy supply with their **high-capacity factors**. Increasing the use of pumped hydroelectric and battery storage systems will play important roles in **increasing system flexibility**, which will become even more crucial in the coming era.



APLUS Enerji Comments



- > The most significant improvement in terms of different source types has been observed in the **geothermal energy purchase guarantee**. Due to the inability of the previous Renewable Energy Support Mechanism (YEKDEM v2.0) to provide an adequate purchase guarantee for geothermal energy, investments in this sector **came to a complete halt in recent years**, resulting in a failure to fully utilize and benefit from a significant energy potential that could have served as a baseload in order to provide electricity. The improvement in the geothermal energy purchase guarantee level, **being around 39%**, will pave the way for new investments in this source, which have high initial capex and investment risks. Similar to geothermal energy, the initial investment costs of pumped-storage hydroelectric power plants are also considerably high. **The extension of the power purchase agreement duration for geothermal and pumped-storage hydroelectric power plants from 10 to 15 years** will expedite their access to financing, for these high initial cost projects and be a cornerstone regarding the addition of these resources into the energy portfolio of the country.
- > **The improvements in Local Component Support Prices and the differentiation in terms of duration** for certain sources such as off-shore wind, pumped hydroelectric storage, and storage-integrated wind/solar will have positive effects on incentivizing the domestic production of various components of these new technologies. On the other hand, it should be noted that the employment of Local Component Support Prices is viewed negatively for violating free trade conditions by some international financial institutions and this practice carries the risk of limiting the amount of international financing that can be received.
- > In addition to the positive developments mentioned above, there are also **some uncertainties** surrounding the operation of the new mechanism that need to be addressed. These uncertainties include the **process for wind and solar projects, how much capacity will be allocated, the scheduling of application submissions, the capacity allocation methodology**, and the possible **competition process**. It is crucial that these details are determined and shared with the public in a timely manner to ensure the rapid implementation of new projects.
- > The critical issue that will affect the future of all energy investments is the **capacity allocation to be made by TEIAS and the investments required in the transmission infrastructure**. In order to achieve the net-zero carbon target by 2053, the renewable energy installed capacity should be increased in accordance. Seeking this purpose, investments in the transmission system need to be rapidly increased, and new investment models should be developed with this aim.

To summarize, the newly-introduced YEKDEM is an important step towards closing the current **gap in energy investments models** and to **increase renewable energy investments** in the market. The determination and public declaration of the details concerning the operation and management of the new application will be of vital importance to rapidly address **the halt in investments experienced in the last two years**.

The introduction of the new YEKDEM will serve as the fourth investment model in the renewable energy market, in addition to YEKA projects, unlicensed/hybrid investments, and storage-enabled wind/solar projects, which will further boost activity in the renewable energy sector. For the years ahead, it appears possible for Turkey **to fully benefit from its renewable energy potential and achieve its 2053 net-zero carbon target**, following the resolution of some of the remaining issues in the market.