

# RES Support Schemes: Impact on Energy Transition and Fossil Fuel Substitution

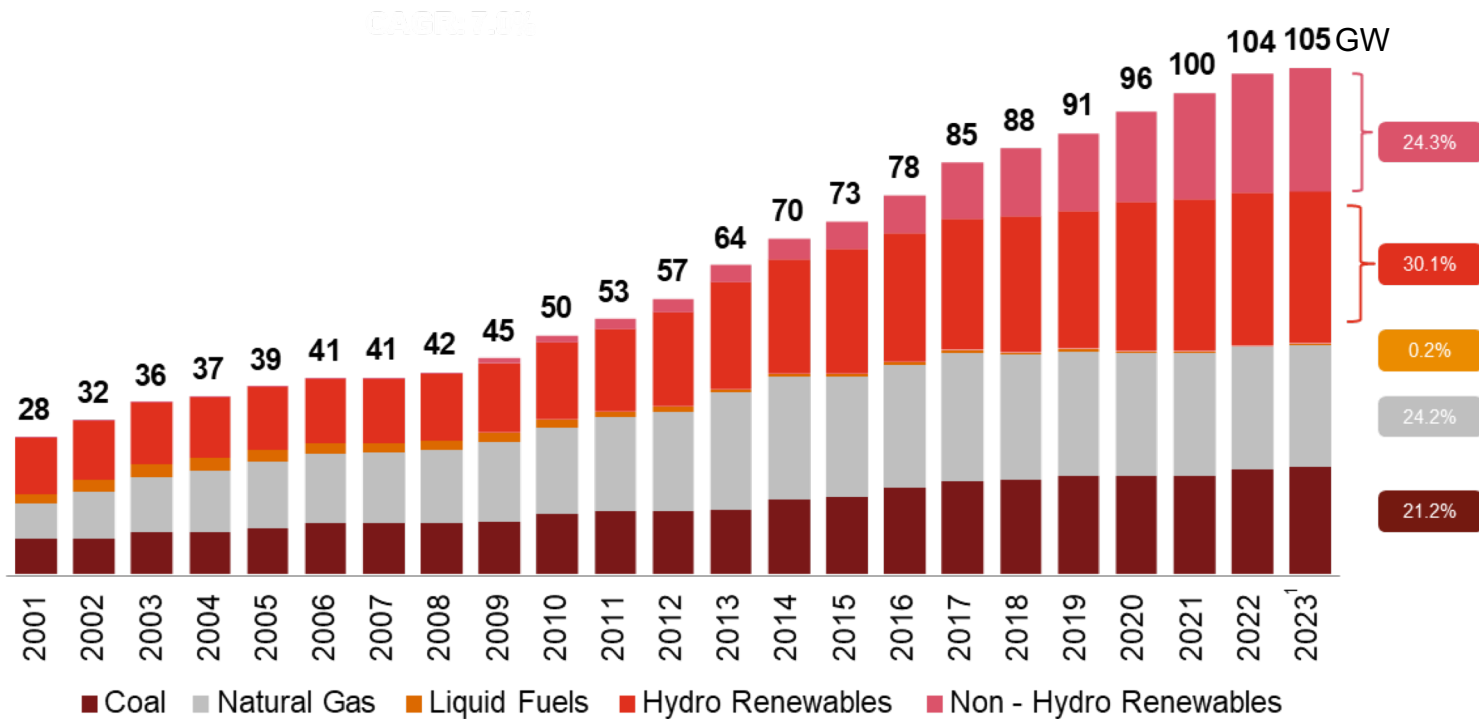
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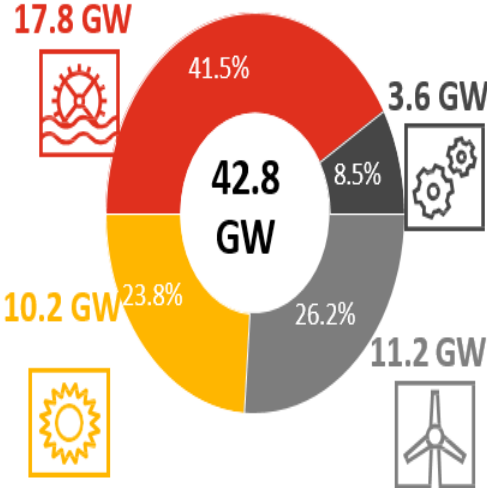


# Key Figures: Renewable Energy

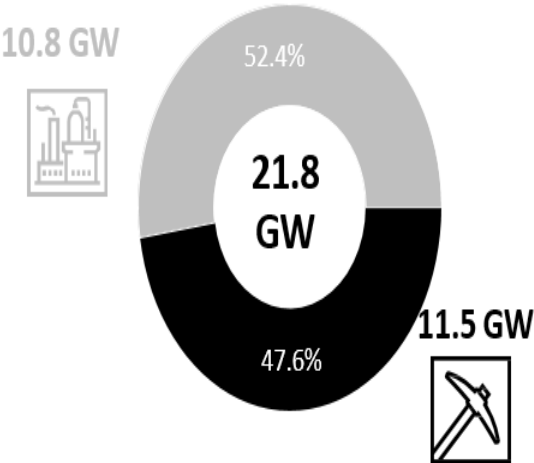


# Key Figures: Renewable Energy

Additions in Renewable Installed Capacity (2009-2023) 2009 base :45 GW



Additions in Thermal Installed Capacity (2009-2023) 2009 base :45 GW



# Overview of Supporting Scheme-1: YEKDEM (FiT)

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Programs to increase renewables in the energy mix: feed-in-tariffs, quota programs, tradable carbon certificates, contracts for difference (CfD) rounds.

YEKDEM was emerged in 2005, and provides financial support for renewable energy projects through feed in tariffs.

Renewable installed capacity in Türkiye grew substantially in the last decade with the guaranteed price through YEKDEM.

# YEKDEM: Key Details

- First implemented in May 2005
- The renewable power plants commissioned until June 30, 2021 can benefit from purchase guarantee prices shown below until 31 Dec. 2030

Renewable Energy Source	Feed-in Tariff (USDcents /kWh)	Local Component Incentive (USDcents/kWh)
Hydroelectric	7,3	0,1 – 2,3
Wind	7,3	0,6 – 3,7
Geothermal	10,5	0,7 – 2,7
Solar	13,3	0,4 – 5,6
Biomass	13,3	0,5 – 6,7

## YEKDEM: Results (a way to the second phase of YEKDEM)

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- As the frequency of the large-scale currency depreciations increased, USD denominated YEKDEM FiT started to cause fiscal pressure on the Treasury. As a result, it was introduced a new TL denominated support mechanism encompassing new conditions for the power plants to be commissioned after June 30, 2021.
- The power plants commissioned between July 1, 2021 and December 31, 2025 will be eligible to benefit from the new TL denominated 10-year FiT. The new schedule includes a domestic component incentive for 5 years if it is approved that 51% of the components used in the power plant are domestically manufactured.

# Overview of Supporting Scheme-2: Second Phase of YEKDEM (FiT)

- On May 1, 2023 , the new FiT mechanism was revised and extended to better reflect the expectations of the market participants and respond to the recent developments in the energy markets.

Renewable Energy Source		YEKDEM FiT (TL/MWh)	YEKDEM FiT Duration (Years)	YEKDEM FiT Floor (USD/MWh)	YEKDEM FiT Ceiling (USD/MWh)	Local Component Incentive (TL/MWh)	Local Component Incentive Duration (Years)
Hydro	Reservoir	1,440.0	10	67.5	82.5	288.0	5
	Run of River	1,350.0	10	63.0	77.0	288.0	5
Wind	Onshore	1,060.0	10	49.5	60.5	288.0	5
	Offshore	1,440.0	10	67.5	82.5	384.5	5
Geothermal		2,020.0	15	94.5	115.5	288.0	5
Biomass	Landfill Gas	1,060.0	10	49.5	60.5	288.0	5
	Biomethanization	1,730.0	10	81.0	99.0	288.0	5
	Thermal Disposal	1,349.0	10	57.5	80.0	215.8	5
Solar		1,060.0	10	49.5	60.5	288.0	5
Solar / Wind with Storage		1,250.0	10	58.5	71.5	384.5	10
Pumped-Storage Hydro		2,020.0	15	94.5	115.5	384.5	10
Wave & Marine Current Power		1,350.0	10	63.0	77.0	384.5	10

# Second Phase of YEKDEM: Key Details

## Escalations

YEKDEM Escalation Mechanism Implemented in 2021

$$\text{YEKDEM FiT on Month } M = \text{YEKDEM}_M =$$

$$\text{YEKDEM}_{M-3} \times$$

$$\left[ \left( 26\% \times \frac{\text{PPI}_{M-2}}{\text{PPI}_{M-5}} \right) + \left( 26\% \times \frac{\text{CPI}_{M-2}}{\text{CPI}_{M-5}} \right) + \left( 24\% \times \frac{\text{USD}_{M-2}}{\text{USD}_{M-5}} \right) + \left( 24\% \times \frac{\text{EUR}_{M-2}}{\text{EUR}_{M-5}} \right) \right]$$

Weight of Inflation Indexes: 52%

Weight of Change in FX Rates: 48%

Update Frequency: 3 Months

YEKDEM Escalation Mechanism Updated in May 2023

$$\text{YEKDEM FiT on Month } M = \text{YEKDEM}_M =$$

$$\text{Local Component Incentive on Month } M = \text{LCI}_M =$$

$$\text{YEKDEM}_{M-1} \times$$

$$\text{LCI}_{M-1} \times$$

$$\left[ \left( 25\% \times \frac{\text{PPI}_{M-2}}{\text{PPI}_{M-3}} \right) + \left( 15\% \times \frac{\text{CPI}_{M-2}}{\text{CPI}_{M-3}} \right) + \left( 30\% \times \frac{\text{USD}_{M-1}}{\text{USD}_{M-2}} \right) + \left( 30\% \times \frac{\text{EUR}_{M-1}}{\text{EUR}_{M-2}} \right) \right]$$

Weight of Inflation Indexes: 40%

Weight of Change in FX Rates: 60%

Update Frequency: 1 Month



# Overview of Supporting Scheme-3: RENEWABLE ENERGY RESOURCE ZONES (RE-ZONE/YEKA) MODEL (Auction Model)

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An investment model developed by Ministry of Energy in 2016 to support renewable energy investments and incentivize local manufacturing of renewable power generation assets.

# RENEWABLE ENERGY RESOURCE ZONES (RE-ZONE/YEKA) MODEL (Auction Model): Key Details

1

## Solar PV Tender (Mar. 2017)

- 1 GW capacity
- Konya, Karapınar region
- Winning bid: **6,99 \$ cents/kWh** (Kalyon Group)
- PPA for 15 years
- 60% local content and R&D Investment
- Generation licence → Sep. 2020
- 785 MW capacity commissioned so far.



2

## Onshore Wind Tender (Aug. 2017)

- 1 GW capacity
- Sivas, Edirne, Kırklareli, Eskişehir regions
- Winning bid: **3,48 \$ cents/kWh** (Siemens-Türkerler-Kalyon Consortium)
- PPA for 15 years
- R&D for at least 10 years, %65 local content
- Pre-licences for 6 projects → Sep. 2020



# RENEWABLE ENERGY RESOURCE ZONES (RE-ZONE/YEKA) MODEL (Auction Model): Key Details

3

## Onshore Wind Tender (May. 2019)

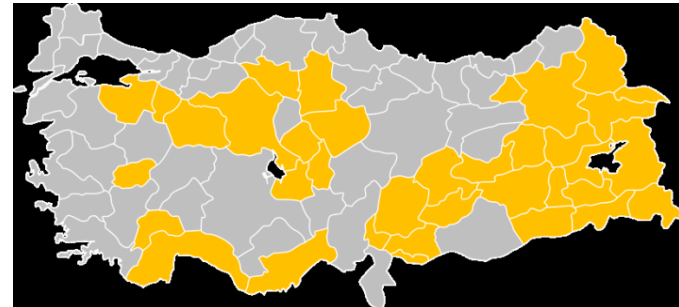
- 1 GW capacity (250 MW each for Aydın, Çanakkale, Muğla, Balıkesir)
- Winning bids: Aydın (Enerjisa, **4,56 \$ cents/kWh**), Çanakkale (Enerjisa, **3,67 \$ cents/kWh**), Muğla (Enercon, **4 \$ cents/kWh**), Balıkesir (Enercon, **3,53 \$ cents/kWh**)
- PPA for 15 years



4

## Mini Solar Tenders (Apr/May 2021)

- 1 GW total capacity (10, 15 or 20 MW)
- 74 connection regions in 36 cities
- Ceiling price: **35 TL kuruş/kWh**
- Auction dates: 26-29 Apr (260 MW) & 24-28 May (740 MW)
- Winning bids: between **18,2-32 TL kuruş/kWh (2,16-3,80 \$ cents/kWh)**



# RENEWABLE ENERGY RESOURCE ZONES (RE-ZONE/YEKA) MODEL (Auction Model): Key Details

5

## Onshore Wind tender (May 2022)

- 850 MW capacity
- 20 connection regions
- 95 krş/kWh ceiling price
- PPA for duration of 35 TWh generation
- 55% local content
- Winning bids: between 40,8-77,8 TL kuruş/kWh (2,36-4,51 \$ cents/kWh)

6

## Solar PV Tender (April 2022)

- 1 GW capacity
- PPA for duration of 35 TWh generation
- 95 krş/kWh ceiling price
- Winning bids: between 37,5-59,7 TL kuruş/kWh (2,56-3,59 \$ cents/kWh)



# Overview of Supporting Scheme-4: Unlicensed Model

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- Real persons or legal entities may install renewable energy systems generating **up to 1 MW (later 5 MW) and (now up to autoconsumption)** of energy without any requirement to obtain a licence.
- The aim is to use the generated electricity for own consumption. Excess electricity (limited to the consumption amount) can be sold to the grid by monthly net settling.
- Started with small-scale solar PV plants, rooftop solar PV units or other renewable based small-scale facilities.

# Unlicensed Model: Key Details

## Prior To 2019

- No limit on electricity sold to the national grid
- Is eligible for YEKDEM FiT
- Can benefit from local component incentive included in YEKDEM and regional investment incentives

## Landscape in 2019-2022

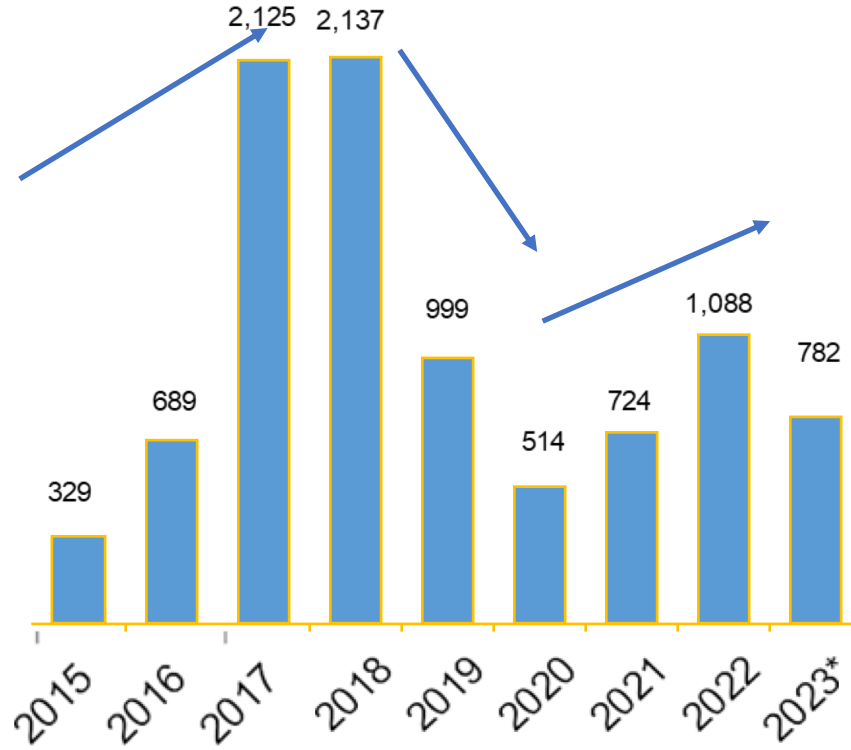
- No limit on electricity sold to the national grid
- Is not eligible for YEKDEM FiT
- Can only benefit regional investment incentives

## After mid 2022

- Can only sell to the grid as much as the self-consumption level
- Is not eligible for YEKDEM FiT
- Can benefit from the 4<sup>th</sup> region incentives such as VAT and import tax exemption

# Unlicensed Model: Results

Unlicensed power plants account for 10% of Türkiye's total installed capacity with 10.7 GW of installed capacity. Approximately 93% of the unlicensed capacity belongs to solar.



# Overview of Supporting Scheme-5: Renewable Power Plants with Storage Systems

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The Turkish government has introduced new legislation focused on renewable energy power plants integrated with storage systems. The main goals of this legislation are:

Firstly, to increase the stability and reliability of wind and solar power plants. By adding storage capabilities, these renewable plants can ensure a more continuous supply of electricity to the grid, even when the wind isn't blowing or the sun isn't shining.

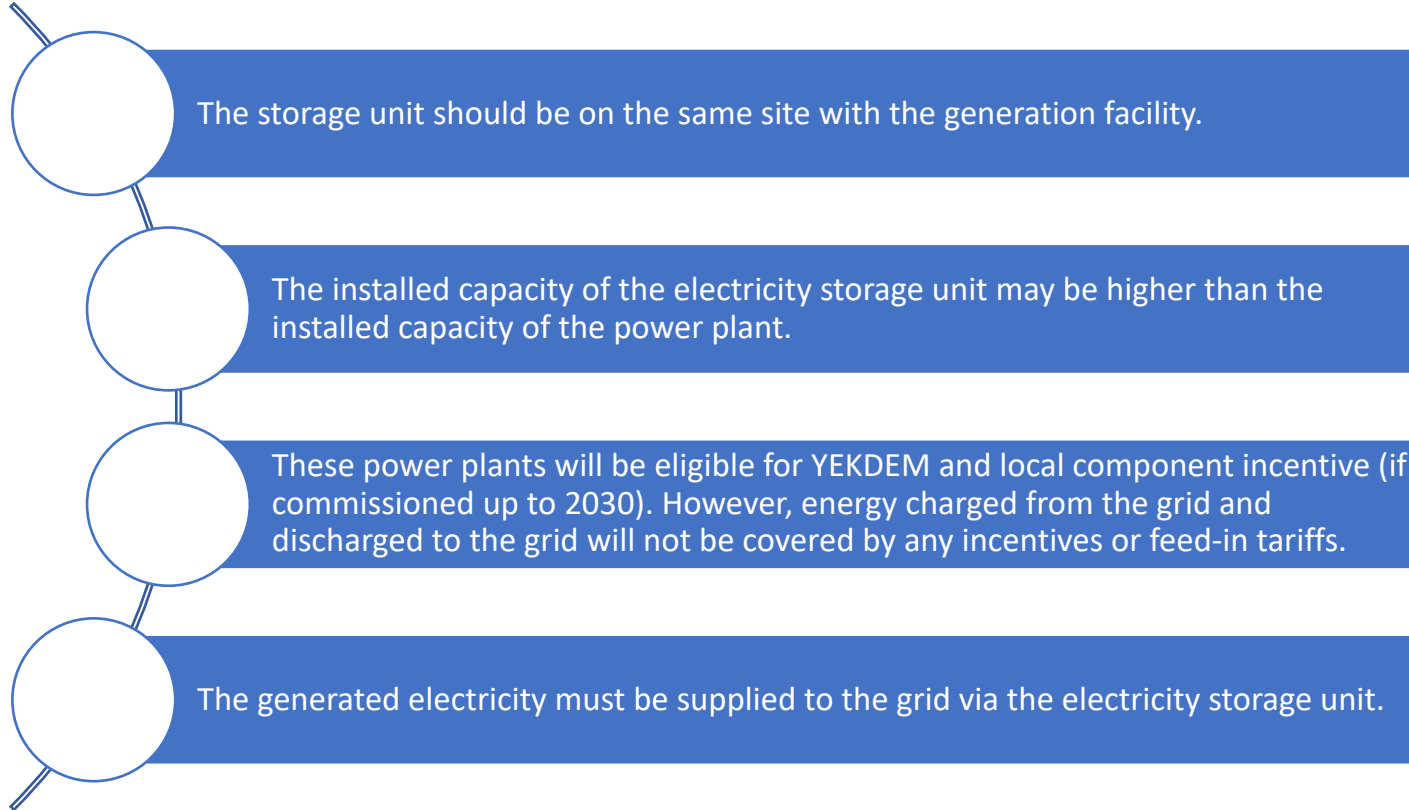
Secondly, to help create a more stable and predictable national electricity grid. With storage, renewable energy can be better integrated into the grid, reducing fluctuations and intermittency issues.

In this context, the Amendments to the Electricity Market Law that were implemented in July 2022 in order to pave the way for integrating renewables with storage systems without participating in tenders organized by TEIAS or YEKA auctions by MENR. Accordingly, TEIAS announced to allocate 35 GW for renewables with storage and EMRA started accepting pre-licence applications for those renewables with storage facilities in November 2022. The online application platform was open up to September of 2023.



# Renewable Power Plants with Storage Systems: Key Details

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# Renewable Power Plants with Storage Systems: Results

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EMRA received applications for renewable power plants with storage with a stunning 260 GW in total. As of 4.11.2024, 33,55 GW capacity has been allocated to 683 prelicenses.



5968 applications for 260 GW capacity has been received by EMRA

1883 applications-127 GW in wind power plants

4085 applications-133 GW in solar power plants



683 prelicenses were granted by EMRA which constitute 30.32 GW of installed capacity.

264 prelicenses -18.65 GW in wind power plants

419 prelicenses -14.9 GW in solar power plants

# Thank You

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