

# **Turkey Solar Energy Market By Technology (Photovoltaic Systems, Concentrated Solar Power Systems), By Solar Module (Monocrystalline, Polycrystalline, Cadmium Telluride, Amorphous Silicon Cells, and Others), By Application (Residential, Commercial, and Industrial), By End-Use (Electricity Generation, Lighting, Heating, and Charging), By Region, Competition, Forecast, and Opportunities, 2028**

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## **Abstracts**

Turkey solar energy market is anticipated to grow over the forecast period. Turkey's energy consumption is increasing by 4-6% every year as an ever-growing and industrializing country. The country plans to generate two-thirds of its electricity from local and renewable resources by the end of 2023.

Turkey is one of the fastest-increasing energy markets among the OECD countries. The Turkish government has committed to double the capacity of installed solar and wind power by 2027 and to invest around USD 110 billion in the energy sector. The share of renewable energy in total power generation increased from 18.15% in September 2018 to 35.45% in September 2019. This marks a 41% increase in power generation from renewable energy sources. Solar power generation increased by 145 %, wind power generation increased by 16.46%, and HPP power generation increased by 61%.

Moreover, Turkey's geographical location is significantly more favorable in terms of solar energy potential, ordering it well ahead of many countries in the solar energy market. According to the Renewable Energy General Directorate and the State

Meteorology Affairs General Directorate, the country's average annual total sunshine duration is 2,640 hours, a total of 7.2 hours per day, with an average total radioactivity intensity of 1.311 kWh/m<sup>2</sup>-years. Turkey has a staggering likelihood to construct an average of 1.100kWh per square meter if mandatory investments are made in solar energy plants. This makes Turkey the second-best country in Europe in terms of solar power investment potential.

Solar energy is energy that is yielded by the sun and exploited using a range of technologies, including solar panels, solar thermal energy, and solar design. It is a clean renewable energy resource and has the prospect to provide energy for an ample range of applications, including water warming, electricity production, and space heating and cooling.

### Shifting Electricity Sector Toward Sustainability

Energy is the key driver of wealth and social life. Nevertheless, energy creation-related environmental problems owing to fossil-fuel use direct humankind toward renewable energy resources. Having an increasing population and a developing economy, Turkey has the highest increase rate in electricity demand (6-7% annually) among all organizations for Economic Co-operation and Development countries and imports 74% of resources to meet its primary energy demand. In 2019, 56% of electricity was generated from fossil resources, mostly from imported hard coal and natural gas.

Moreover, Under the United Nations Framework Convention on Climate Change and the 2015 United Nations Climate Change Conference, Turkey has committed to a 21% greenhouse gas (GHG) emission reduction by 2030 which corresponds to 246 million tons of CO<sub>2</sub> equivalents. To achieve this commitment, Turkey aims to increase its solar capacity to 10 GW and to reduce transmission losses to 15% in the electricity sector. Solar energy is a promising local and renewable energy source for Turkey. The contribution of photovoltaics (PVs) to the electricity mix is new in Turkey. In 2015, the percentage of PVs in the mix was 0.23% and in 2019 it was 3.05%. The PV industry showed a capacity growth of 213% in 2018; 249 MW of installed capacity in 2015 increased to 6700 MW in 2020. The increase in the solar power share in the Turkish electricity mix is expected to accelerate with government subsidies sourcing from GHG emission-reduction commitments, energy security, and independency targets of the country. Therefore, Turkey solar energy market is anticipated to grow during the forecast period.

### Supportive Government Policies and Programs

Turkey has excellent solar energy potential due to its geographic location, with a total annual solar irradiation time of 2,741 hours (7.5 hours per day). To tap this natural resource, the Turkish government has developed several policies and programs to increase its share of the renewable energy mix. In 2021, renewable energy generation in Turkey was reported at 62.7 TWh, an increase of 22% from the previous year. In recent years, the increased solar energy generation resulted in a rise in total renewable energy generation in the country.

In 2022, the Turkish government, at the COP27 climate summit, announced its strategy to reduce greenhouse gas emissions by 41% below business-as-usual levels by 2030 and achieve net-zero emissions by 2053. As electricity generation is primarily responsible for emitting the highest emissions, deploying clean energy technologies, such as solar energy systems, would be essential. Hence, the solar energy market would see an upsurge in the installations of projects.

In 2023, the National Energy Plan announced by the government projected solar energy capacity to reach 2.9 gigawatts with an increase of approximately 500% by 2035, which is deemed to have the highest share in total installed generation capacity. The National Energy plan envisages achieving 100% clean electricity by 2035.

In October 2022, the Turkish government enabled USD 409 million to set up a 2 GW vertically incorporated solar module manufacturing facility in Izmir. The finance is received by Smart Solar Technologies to obtain the project. As per the Eleventh Development Plan (2019-2023), the Turkish government plans to achieve 38.8% of renewables in power generation by the end of 2023 and plans to commission 10 GW each of solar and wind capacity in the period 2018-28.

### Increasing Awareness of Net-Zero Emission Plan

Solar energy is a cautious and environmentally friendly alternative to fossil fuels that can minimize greenhouse gas emissions, decrease the effects of climate change, provide energy security, and increase consumers' standard of life. Turkey produced 403.3 million metric tons of carbon dioxide (MtCO<sub>2</sub>) emissions in 2021. Due to this, the government is focusing on decarbonization methods. For instance, In October 2021, Turkey endorsed the Paris Agreement on climate and promised to accomplish net zero carbon emissions by 2053. These initiatives are estimated to boost the predictions for renewable energy sources, such as solar energy, and increase the demand for solar energy systems over the next few years.

## Acceptance of Solar Photovoltaic (PV) Technology

In future years, investment in solar energy is anticipated to increase since solar PV is quickly becoming the most affordable alternative for new energy generation in the country. Solar PV technology has emerged as the most preferred alternative energy generation technology in the nation, backed by the country's supportive policies and increased emphasis on meeting various capacity objectives. This is likely to aid the expansion of Turkey's entire solar energy sector during the forecast period. Solar PV technology is a significant aspect of Turkey's solar energy market. With accelerating technological advancements and simple installation processes, solar PV technology has been evolving more quickly. For the same reason, solar PV technology is preferred in the residential, commercial, and industrial sectors. Hence, due to this, the Turkey solar energy market is expected to grow during the forecast period.

## Market Segments

The Turkey solar energy market is segmented into technology, solar module, application, end-use, and region. Based on technology, the market is segmented into photovoltaic systems and concentrated solar power systems. Based on solar modules, the market is segmented into monocrystalline, polycrystalline, cadmium telluride, amorphous silicon cells, and others. Based on application, the market is segmented into residential, commercial, and industrial. Based on end-use, the market is segmented into electricity generation, lighting, heating, and charging. Based on region, the market is segmented into the Marmara region, Central Anatolia, Aegean region, Mediterranean region, Black Sea region, South-Eastern Anatolia region, and Eastern Anatolia region.

## Market Players

Key players in the Turkey solar energy market are Halk Enerji Yatırım ve Ticaret A.Ş., Asunim Yenilenebilir Enerji Anonim Şirketi, GO Enerji, HT Solar Energy J.S.C, Eko Renewable Energy Inc., Akfen Renewable Energy, Ankara Solar AS, Solimpeks Solar Energy Corp., Zorlu Energy Group, and Smart Solar Technologies

## Report Scope:

In this report, The Turkey solar energy market has been segmented into the following categories, in addition to the industry trends, which have also been detailed below:

## Turkey Solar Energy Market, By Technology:

Photovoltaic Systems

Concentrated Solar Power Systems

## Turkey Solar Energy Market, By Solar Module:

Monocrystalline

Polycrystalline

Cadmium Telluride

Amorphous Silicon Cells

Others

## Turkey Solar Energy Market, By Application:

Residential

Commercial

Industrial

## Turkey Solar Energy Market, By End-Use:

Electricity Generation

Lighting

Heating

Charging

## Turkey Solar Energy Market, By Region:

Marmara region

Central Anatolia

Aegean Region

Mediterranean Region

Black Sea Region

South-Eastern Anatolia Region

Eastern Anatolia Region

### Competitive Landscape

**Company Profiles:** Detailed analysis of the major companies present in the Turkey solar energy market.

### Available Customizations:

With the given market data on the Turkey solar energy market, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

### Company Information

Detailed analysis and profiling of additional market players (up to five).

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