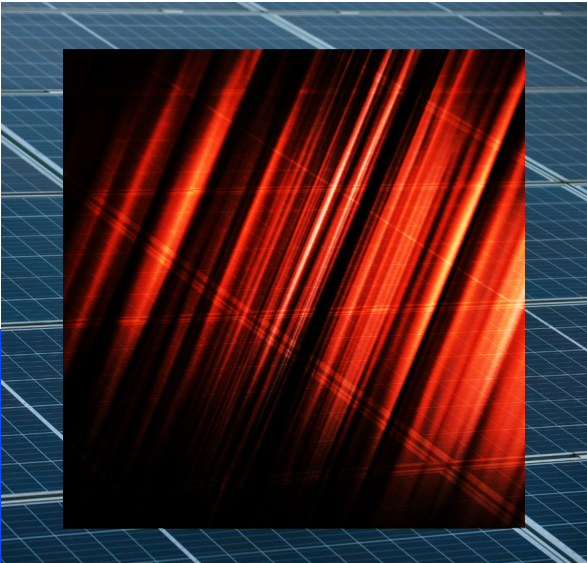


# Solar Energy Policy in Uzbekistan: A Roadmap



Explore Uzbekistan's opportunity to take advantage of its solar energy potential and integrate it into the larger Uzbek energy strategy, in order to increase energy efficiency and meet rising demand.

Experience the full roadmap at [iea.org/programmes/eu4energy](https://www.iea.org/programmes/eu4energy)

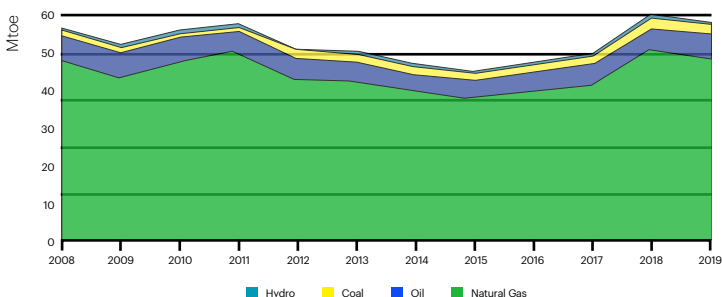
# Uzbekistan's Energy & Power Mix

Uzbekistan is a **net exporter** and one of the world's largest natural gas producers, with **natural gas** accounting for 90.5% of total energy production in the country. The country's energy supply is also dominated by **fossil fuels**, with renewable energy - almost exclusively **hydropower** - accounting for only 1% of total energy production in 2019.

## Energy Supply

In 2019, **natural gas** accounted for 85.8% of the **total energy supply**, with the rest coming from **coal**, **oil** and **hydro**.

### Total Energy Supply in Uzbekistan, 2008-2019

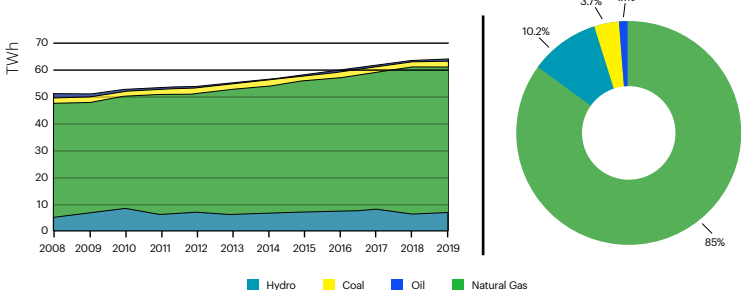


Source: IEA (2021a), World Energy Statistics and Balances (database), <https://www.iea.org/data-and-statistics>

## Electricity Generation

In terms of **overall electricity generation** in 2019, **natural gas** accounted for 85%, followed by **hydropower** (10.2%) and **coal** (3.7%). **Solar and wind energy**, were negligible.

### Uzbekistan's Electricity Generation by Source, 2008-2019 (left) and Generation Mix in 2019 (right)

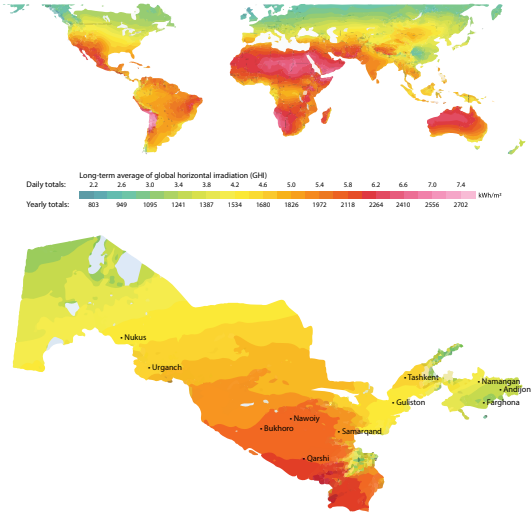


Source: IEA (2021), World Energy Balances 2021 (database), [www.iea.org/statistics](http://www.iea.org/statistics).

# Solar Energy Potential

With good **sunshine** conditions throughout the year and **high values of solar irradiation**, Uzbekistan has huge **potential to deploy solar photovoltaic (PV)** as well as **concentrating solar power (CSP)** which uses solar rays to heat a fluid that directly or indirectly runs an electricity generator. In fact, solar thermal is already used in a number of countries benefiting from levels of solar insolation similar to those in Uzbekistan.

## Global Horizontal Irradiance (GHI), World (top) and Uzbekistan (bottom)

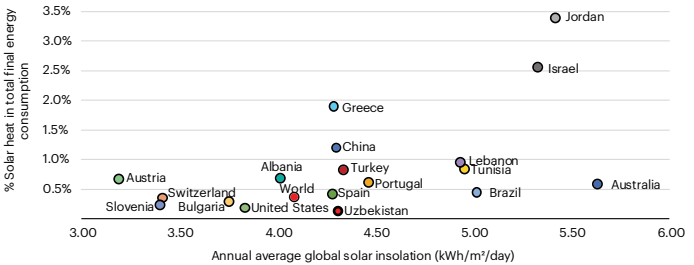


Notes: This map, adapted by the IEA, was obtained from the Global Solar Atlas 2.0, a free, web-based application, developed and operated by the company Solargis s.r.o. on behalf of the World Bank Group, utilising Solargis data, with funding provided by the Energy Sector Management Assistance Program (ESMAP). For additional information, see: <https://globalsolaratlas.info>. The works are licensed under the Creative Commons 4.0 Attribution International license, CC BY 4.0.

Source: World Bank Group, ESMAP and Solargis (2021), Global Solar Atlas, <http://globalsolaratlas.info>. Global Solar Atlas: Uzbekistan, <https://globalsolaratlas.info/download/uzbekistan>

The **gross potential** of solar energy in Uzbekistan totals 2,134 x 103 PJ, while the **technical** potential is estimated at 7,411 PJ, equivalent to almost **four times** the country's current primary energy consumption.

## Uzbekistan's Solar Heat Consumption



Notes: The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.  
Sources: Based on IEA (2021a), World Energy Statistics and Balances (database) <https://www.iea.org/data-and-statistics>, World Bank Group, ESMAP and Solargis (2021), Global Solar Atlas, <http://globalsolaratlas.info>.

# Barriers and Opportunities for Renewables

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## Objectives

In May 2020, the Uzbek government developed the **Concept Note (CN)** for **Ensuring Electricity Supply in Uzbekistan in 2020-2030** to define medium- and long-term objectives and directions for the development of the power sector. The CN identifies **six main objectives** to improve electricity supply:

- ▶ Satisfy the country's **power demand**;
- ▶ Improve the nation's **energy efficiency**;
- ▶ Increase the energy efficiency of **power generation and transmission**;
- ▶ Reduce the damage of **power facilities**;
- ▶ Develop and expand the use of **renewables** and their **system integration**; and
- ▶ Develop an efficient **electricity market**.

## Government Targets

In order to **ensure energy security** and **promote renewable energy use**, the Government of Uzbekistan has set the following targets:

- ▶ Increase the **share of renewable electricity** in the power mix to more than 25% by 2030, compared to 10.2% in 2019.
- ▶ Increase **renewable generation capacity** to 5 GW for solar PV and 3 GW for wind by 2030, compared to the current negligible level.

## Possible Barriers

Uzbekistan may encounter an **array of barriers** that could hamper the deployment of solar energy technologies, including, but not limited to:

- ▶ Inadequate solar resource exploration
- ▶ Information transparency of the electricity infrastructure and market
- ▶ Unclear rules on permitting
- ▶ Fossil fuel subsidies
- ▶ Needs for power system flexibility



# Vision for 2030

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A more **comprehensive set of policies and support mechanisms** is required to make the maximum development of solar energy capacity in Uzbekistan toward 2030. The government needs to consider packaging the range of actions from the following three aspects:

1

Maximising the **benefits of solar energy** in the energy system (e.g., solar potential exploitation, transparent information, policy targets and incentives)

2

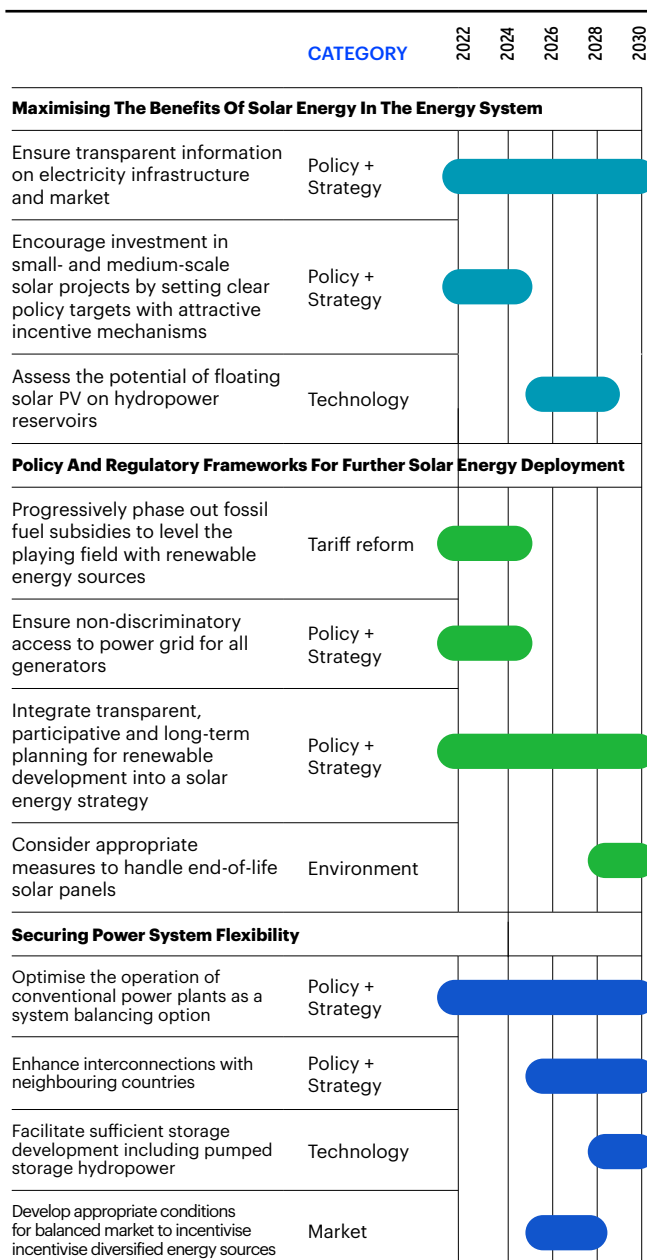
**Policy and regulatory frameworks** enabling further solar energy deployment (e.g., phasing out fossil fuel subsidies, transparent, participative and long-term renewable planning)

3

Increasing **power system flexibility** to integrate the increasing amount of solar generation. (e.g., balancing markets, pumped storage hydropower, interconnections)

**Integrating Uzbekistan's solar energy strategy** into its larger energy strategy, while also looking towards **increased regional co-operation**, particularly on electricity trading, will allow Uzbekistan to truly take advantage of its **significant solar potential** in a **cost-efficient manner**.

# Attaining the Vision



**An extended set of policy recommendations is included in the full roadmap**



Co-Funded by the European Union

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