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
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**


**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)**

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.

The gross potential of solar energy in Uzbekistan totals 2,134 x 10^3 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.

Barriers and Opportunities for Renewables

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

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**.
## Maximising The Benefits Of Solar Energy In The Energy System

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<tr>
<th>CATEGORY</th>
<th>2022</th>
<th>2024</th>
<th>2026</th>
<th>2028</th>
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<tbody>
<tr>
<td>Ensure transparent information on electricity infrastructure and market</td>
<td>Policy + Strategy</td>
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<td>Encourage investment in small- and medium-scale solar projects by setting clear policy targets with attractive incentive mechanisms</td>
<td>Policy + Strategy</td>
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<td>Assess the potential of floating solar PV on hydropower reservoirs</td>
<td>Technology</td>
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## Policy And Regulatory Frameworks For Further Solar Energy Deployment

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<tr>
<td>Progressively phase out fossil fuel subsidies to level the playing field with renewable energy sources</td>
<td>Tariff reform</td>
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<td>Ensure non-discriminatory access to power grid for all generators</td>
<td>Policy + Strategy</td>
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<td>Integrate transparent, participative and long-term planning for renewable development into a solar energy strategy</td>
<td>Policy + Strategy</td>
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<td>Consider appropriate measures to handle end-of-life solar panels</td>
<td>Environment</td>
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## Securing Power System Flexibility

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<tr>
<td>Optimise the operation of conventional power plants as a system balancing option</td>
<td>Policy + Strategy</td>
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<td>Enhance interconnections with neighbouring countries</td>
<td>Policy + Strategy</td>
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<td>Facilitate sufficient storage development including pumped storage hydropower</td>
<td>Technology</td>
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<td>Develop appropriate conditions for balanced market to incentivise incentivise diversified energy sources</td>
<td>Market</td>
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### An extended set of policy recommendations is included in the full roadmap

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