

Prospects for Uzbekistan's energy sector

Uzbekistan's energy sector still heavily depends on natural gas. As domestic reserves are depleting and the demand for electricity is increasing, the Uzbek government wants to diversify the country's energy supply. The large-scale expansion of wind and photovoltaic (PV) electricity generation, the construction of the country's first nuclear power plant and the replacement of the old power plant fleet with more efficient gas-fired plants are at the core of the government's 2030 investment plan. Using an electricity system model, we show that the plan's strong focus on inflexible baseload generation implies excessive system costs. We find that a higher deployment of flexible generators and renewables would reduce system costs. In 2019, a first PV tender had promising results.

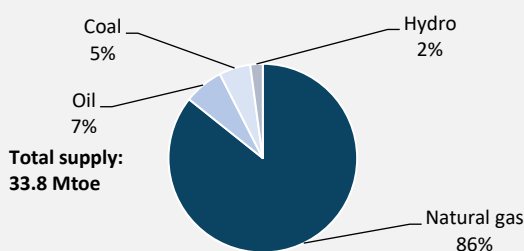
Increased regional electricity trade could provide another option to keep electricity costs in check.

The high investments ahead reinforce the need to reform Uzbekistan's low electricity tariffs in order to achieve cost-recovering electricity generation and incentives for energy efficiency.

Heavy reliance on depleting natural gas resources

Uzbekistan has been heavily reliant on its rich natural gas and oil reserves in the past, both in terms of export revenues and domestic consumption. In 2017, 98% of energy supply came from fossil fuels. However, the reserves that are being exploited by state-owned Uzbekneftegaz and international joint ventures are depleting. While Uzbekistan's export obligations to China and Russia have still increased in 2019 compared to 2018, they will likely fall in the longer term. By around 2025, the government expects gas exports to cease in order to consume and process the remaining natural gas resources entirely within the country. The diversification of energy supply is nevertheless much needed and the guiding theme of Uzbek energy policy.

Total primary energy supply by source 2017

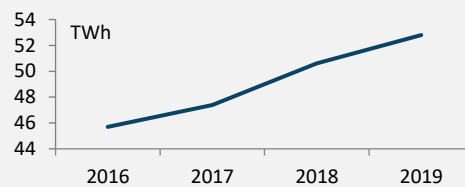


Source: IEA

Rising demand for electricity

Due to strong economic and population growth, electricity demand has been growing significantly in recent years. Especially in the residential sector, demand often outstrips supply, leading to planned cut-offs and blackouts. Even though the government projections of electricity consumption doubling until 2030 may be exaggerated, electricity supply needs to be significantly increased to keep up with the growth in demand.

Net electricity consumption



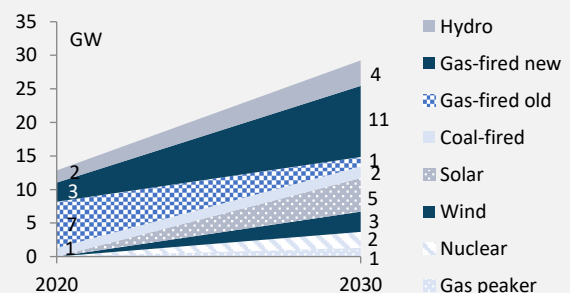
Source: MinEnerg

GET assessment of capacity investment plan

To tackle the issues of supply diversification and growing demand, the Uzbek government pursues an ambitious investment plan to double generation capacity until 2030. The country's first, Russian-built nuclear power plant and a new fleet of combined-cycle gas turbine (CCGT) plants should provide a stable baseload generation. Moreover, the plan foresees the deployment of 3 GW of wind and 5 GW of PV plants.

GET Uzbekistan has assessed the efficiency of the capacity expansion plan by modelling the least-cost dispatch of Uzbekistan's power plant park as envisioned in the government plan. We find that the 2030 plan would lead to an inefficient dispatch, as it combines a high share of inflexible baseload generation with high shares of fluctuating renewables. We show that total system costs can be reduced if the planned baseload capacity (nuclear and CCGT) is partly replaced by flexible gas-fired peaking plants and renewables.

2030 government capacity investment plan



Source: MinEnerg

Significant potential for renewable electricity

As technology costs for renewables are projected to decrease further in coming years, taking advantage of Uzbekistan’s large potential for PV and wind electricity generation is a sensible strategy. Due to agricultural irrigation constraints, the full exploitation of Uzbekistan’s hydro-electricity potential is limited.

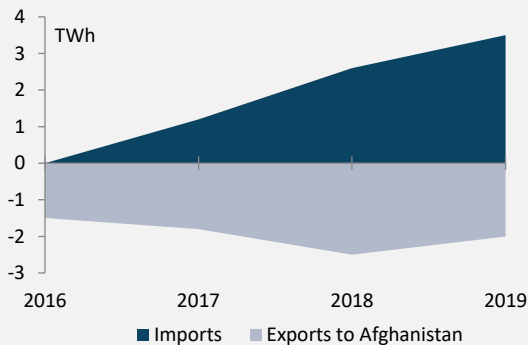
In 2019, the first successful tender for a 100 MW PV plant was held by the Uzbek government as a public-private partnership (PPP). The Emirati company Masdar was awarded with a competitive price bid of 2.7 USD ct/kWh, indicating a promising start to the country’s large-scale deployment.

Regional trade opportunities

Uzbekistan used to be a net exporter of electricity to the region but imports have been rising in recent years due to growing domestic demand. Increased regional trade could represent a cost-efficient opportunity to satisfy Uzbekistan’s increasing demand for electricity while reducing the need for additional, cost-intensive generation capacity in Uzbekistan to some extent.

Utilising Central Asia’s comparative advantages in energy supply has a long tradition. While water-rich Kyrgyzstan and Tajikistan usually export excess hydro-electricity in summer, gas-rich Uzbekistan and Turkmenistan export electricity in winter. The current trade conditions are beneficial for Uzbekistan: The import price of 1.2 USD ct/kWh for Kyrgyz hydro-electricity is below Uzbek thermal generation cost, whereas Uzbek electricity exports to Afghanistan at 6 USD ct/kWh are profitable. Initiatives such as the Central Asia South Asia 1000 kV high-voltage line (CASA1000) aim at further increasing regional electricity trade. Without transparent electricity markets in place, however, regional trade relations still heavily depend on politics.

Electricity imports and exports



Source: MinEnergO

Reforming electricity tariffs to achieve cost-recovery

Uzbekistan implements a wide-ranging electricity tariff reform in order to achieve cost-recovery for generators until 2023 and reduce the country’s energy intensity. Since 2014, residential electricity tariffs have more than doubled. Still, they are only at around 3 USD ct/kWh, which implies that most of Uzbekistan’s thermal power plants are incurring losses. Yet, electricity tariffs are amongst the highest in Central Asia when compared to income, which especially hurts low-income households. To protect vulnerable consumers, the tariff reform is accompanied by increases in minimum wages and pensions. Due to the COVID-19 crisis, planned tariff increases have been temporarily suspended.

Conclusion

Amid declining natural gas resources, the diversification of Uzbekistan’s energy sector is a crucial task for the government. Taking advantage of the country’s large renewables potential is a sensible strategy in this regard. However, the 2030 investment plan focuses too little on providing the necessary flexibility to balance renewable electricity generation. This could lead to an inefficient utilisation of power plants and thus excessive cost.

The ambitious tariff reform is a necessary step towards a more market-based energy system. Enhanced regional electricity trade could help to reduce costs and thus keep electricity tariffs for consumers at reasonable levels.

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A more comprehensive analysis is provided by the Policy Briefing [Energy Sector Issues in Uzbekistan](#).

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The German Economic Team (GET) advises the governments of Ukraine, Belarus, Moldova, Georgia and Uzbekistan regarding the design of economic policy reform processes and a sustainable development of the economic framework. It is funded by the Federal Ministry of Economic Affairs and Energy and implemented by the consulting firm Berlin Economics.