

Attempt to save Soviet-era electricity network: Uzbekistan case to reform electricity generation industry.

BY AMINA TALIPOVA

"Energy is the 'oxygen' of the economy and the life-blood of growth, particularly in the mass industrialization phase that emerging economic giants are facing today..." - Peter Voser CEO, Shell, World Economic Forum.

Overview

Today Uzbekistan is a Post-Soviet country in Central Asia with a 34 mln of population and \$58 bln of GDP. It is located in the heart of the Central Asia Region, occupying a geopolitically strategic position between Russia and China. For almost three decades, the country was mostly closed to the outside world due to the post-soviet period of uncertainty, civil wars in neighboring countries, and gradually intensified authoritarian regime under the first President's I. Karimov 26-years rule. With an iron fist and cracking down all political opposition, this regime led the country to one of the most corrupted¹, unattractive to foreign investors, and state-regulated in leading industries. The oil and gas sector was the only one that could boast of a short period of investment, from 2005 to 2014, from Petronas, CNPC, KNOC, Lukoil, Gazprom, and several more foreign companies. However, no oil boom occurred, and some companies left the country with a political scandal². Only Lukoil has shown a successful business development strategy, and today accounts for about 25% of all gas production in the country. Significant changes on political and economic fronts have been outlined by the death of long-serving leader Islam Karimov. The rise of his accessor President Shavkat Mirziyoyev has enabled the country to pursue a new course and move away from the authoritarian state-led model. One of the main reforms was the liberalization of the foreign exchange. All state statistics have been tied to the previously fixed exchange rate while the residents could not publically buy foreign currency. Therefore, GDP was artificially inflated, the prices for gas, electricity, and other household utility services have been

set. The prices haven't reflected the economic or market component. Among the reforms, new President declared a target to improve the investment climate with the further goal of privatization and deregulation of the economy. The oil and gas and, for the first time, the generation industries have become key targets of new reforms.

Problem statement

The scientific lay of literature gives numerous evidence that economic growth directly depends on access to energy sources (U.S. Energy Information Administration, 2017; Yergin and Gross, 2012; Ozturk et al., 2010; Fotis et al., 2017). Natural gas (84.8%), coal (5.2%), oil (8.8%), a small amount of water power (1.2%), and biowaste (<0.01%) are the primary energy sources in Uzbekistan (Figure 1, A). It can be noted that neither the energy balance nor the consumption of energy resources has structurally changed. Moreover, looking at (Figure 1, B), one can see the perceptible oddity. While energy consumption and its structure have not changed, the population in 20 years added almost 10 million people. The officially reported GDP grew at an incredibly high rate at an average of 6% per year.

Unfortunately, the main reason was the reduction in energy consumption per person and the deliberate distortion of statistics towards its overestimation. The new President first recognized these challenges. Among the systemic problems is state regulation of prices for electricity, gas, water, and other utilities, depletion of gas fields and reduction in production, obsolescence, and deterioration of infrastructure built in Soviet Union times (Figure 2), an insolvent population with high

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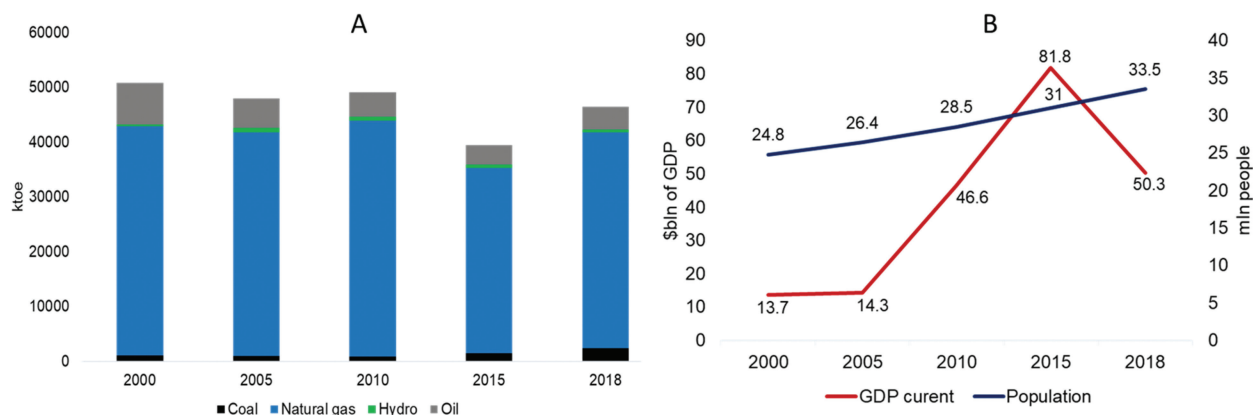


Figure 1. Energy mix, population, and GDP growth in Uzbekistan 2000-2018. Sources: EIA, World Bank.



country is almost 100%. The main problem in the short and long-term is the practical reform of the generation industry to fully secure and sustainably meet the demand against the decrease in fossil fuel extraction and natural gas production (Figure 3, B).

unemployment and, as a result, with massive debts for utilities, and a high level of corruption.

The problems lead to corresponding consequences. Thus, the old infrastructure leads to systematic blackouts and shutdowns in cold-season times, supply interruptions, and, most importantly, leaks and losses during gas transportation or electricity transmission. Infrastructure problems do not also allow full loading of oil refining capacities³. Gas shortages have led to a massive transition of transport vehicles to CNG coupled with the ban on gasoline or diesel fuel imports. In the absence of significant fossil fuel production growth and specifically natural gas (Figure 3, A), this expectedly affected electricity generation and ways to save consumption. Not surprisingly, given fixed prices on electricity, the only way to balance the system is to keep consumption. Therefore, electricity cut-offs can often be observed in rural areas for no reason. While regions are accustomed to living for days without electricity and gas, these problems have not been felt in the capital (Tashkent) for a long time and have not received due attention. Even now, schools and kindergartens in the rural areas are heated by the so-called “kizyak” (manure-made bricks) that is a significant pollutant.

Thus, the lack of growth in energy sources production, ineffective management system, and a lack of infrastructure renovation have led to a decrease in the evolution of energy and electricity consumption per capita. At the same time, the electrification level in the

Reforms and proposed solutions

Electricity market reforms took place in many countries with different economic development levels (Littlechild, 2006; Abbott and Cohen, 2018; Toke, 2011; Arciniegas et al., 2003; (Gencer et al., 2020). At the heart of the reforms, a common feature was the industry unbundling into generation, transmission, and delivery to consumers. Further reforms mainly consisted of creating wholesale markets, balancing, consumer zoning, and privatization. Researchers propose that proper policy regulation leads to competition and consumer price drop as a consequence (Hartley et al., 2019; Kaller et al., 2018; Ahmed and Bhatti, 2019). Unlike proponents of reforms, other researches show that privatization and deregulation do not necessarily guarantee reliable supplies and the lowest prices since oligopolists, dominating suppliers, and collusion can occur, leading to shortages and insecure supply (Woo and Zarnikau, 2009; Woo et al., 2003; Del-Rio et al., 2019; Valadkhani et al., 2018) and even weakening competition (Letova et al., 2018).

The new concept of the reform of the generation industry in Uzbekistan is based on:

- unbundling and further privatization;
- energy efficiency;
- renewable energy sources development,
- renewal and building new infrastructure.

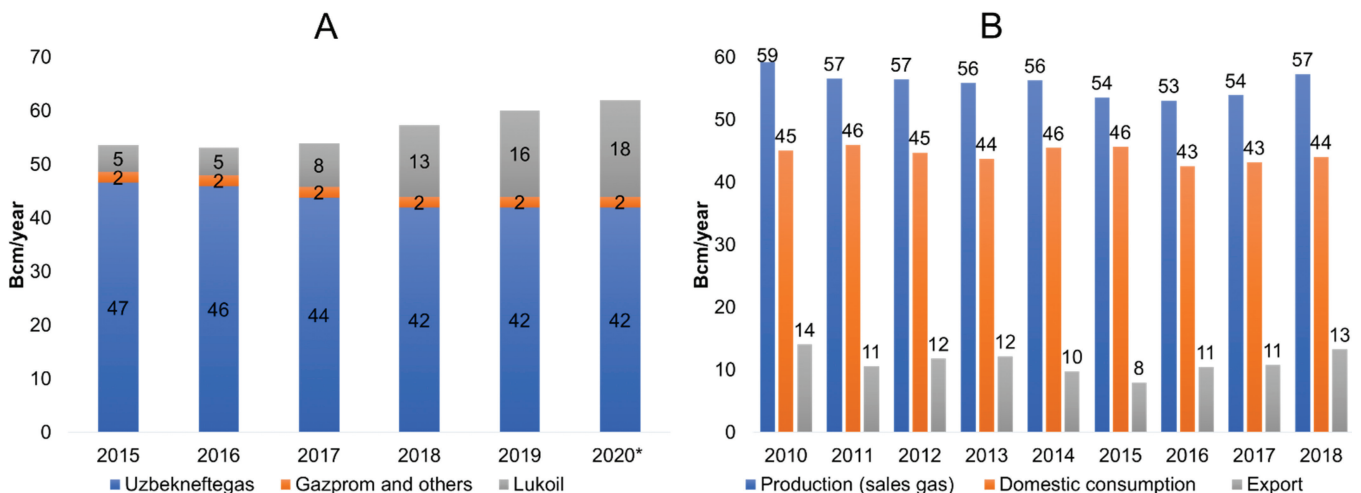


Figure 3. Gas production by company in Uzbekistan (A) and gas balance (B). Source: Oxford Institute for Energy Studies (Pirani, 2019), Uzstat.

The authorities also see the solution in a nuclear power plant construction. Unfortunately, neither the infrastructure nor the consumers are ready for this due to a high unemployment rate and insolvent demand. Besides, the country has serious problems with the water supply to talk about nuclear energy easily. According to the National Concept of Power Generation Industry Development and IEA, by 2030, Uzbekistan will raise the share of renewables in energy balance

supply for at least the whole winter. It means that the lack of natural gas puts the authorities before choosing whether to supply consumers with the gas or redirect it to electricity generation. In 2020, there is still no stable electricity and gas supply in the regions. The authorities continuously report solar power plants' launch and intentions to build a nuclear power plant.

The country lacks a substantiated assessment and plan for further developing regions and remote areas. Considering that the development of industries, schools, hospitals in the whole country is impossible without access to energy is unbelievable without a well-developed plan and strategy,

The following aspects and barriers will hinder the successful implementation of the concept:

1. Reforms are not consistent. All stages are carried out in parallel: infrastructure renewal and plans for constructing solar power plants. Expectedly, there

may not be enough funds, and some of the steps may not be implemented.

2. The system is not ready. More than double capacity in less than ten years, taking into account 50% of obsolete capacity, means constructing and renewing at least an additional 150% capacity. With a rise in government debt, a severe recession during the COVID-19, and a decline in exported gas prices, other loans or an increase in prices will be required. Renovating the electrical system includes many aspects up to replacing the meters for the residents. This plan looks too unrealistic for the current economic situation in the country.

3. The low-income population will suffer. Regulators do not consider the low incomes of the people. With the simultaneous privatization and reconstruction, the inevitable rise in prices will lead to a social crisis in

Table 1. Uzbekistan generating capacity targets to 2030. Source: IEA, Ministry of Energy of Uzbekistan.

Indicator	Forecast generation capacity increase (MW)					Share of electricity generation, %	
	2019	2020	2021	2022	2023-2030	2018	2030
Total	1074.1	886.8	1961.5	1061.6	14017.8	100	100
Traditional energy	1050	1807	1777	2259.4	10910.2	90	75
Including capacity withdrawal	0	1060	320	740	4280	0	0
Total renewables	24.1	119.8	504.2	542.2	7387.6	10	25
hydropower	24.1	119.8	204.5	42.2	1487.6	10	11.2
solar power			300	400	4300		8.8
wind power				100	1600		5

from 0% (excluding hydropower) to 25% and more than double its current generation capacities.

The concept raises many challenges, given that, according to statistics from the Ministry of Energy of Uzbekistan, more than 40% of the infrastructure has been in operation for more than 50 years and has more than 80% wear and tear. This, however, did not prevent regulators from starting market sharing reform. The approach is very similar to the reforms undertaken in other countries, especially Georgia (Asian Development Bank, 2015). It involves allocating generation, transmission, and delivery to consumers with further privatization and developing a guaranteed transmission operator.

Will the new reform provide a reliable electricity supply and eliminate shortages and blackouts?

Despite a reasonably logical general concept of reforming the industry, its main drawback is that it is like two peas to reforms in many other countries. Unfortunately, as studies above show, reform and privatization have led to security supply and sustainable power generation not everywhere. The concept worked out by the Ministry of Energy doesn't contain a plan following characteristics of the current state of the industry in the country and under socio-economic realities

In October 2020, Uzbekistan reported a 20% drop in natural gas production and warned all household consumers about expected electricity shortages. The authorities also warned that they would disconnect all catering, restaurants, and all other food providing business owners from the gas

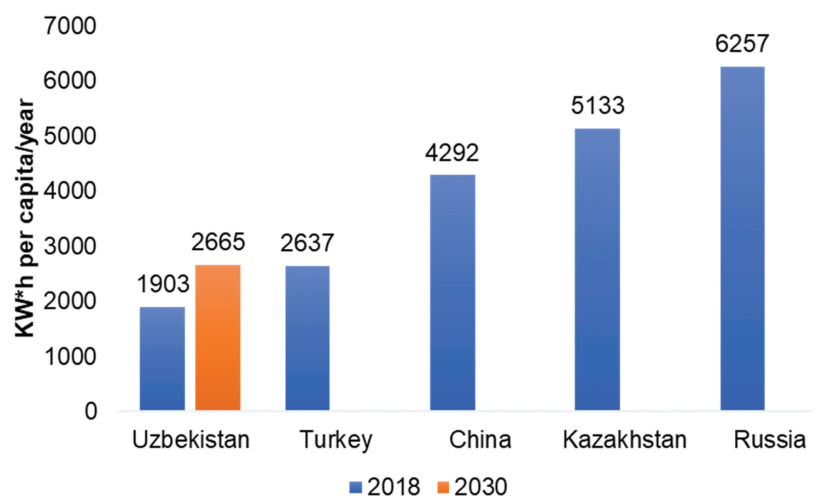


Figure 4. Electricity consumption per capita in different countries. Sources: Ministry of Energy of Uzbekistan, World Bank. p.17

the country where income today is less than \$2000 per year on average.

4. Still not enough. Even such an ambitious plan, if it is yet implemented, will not equalize Uzbekistan in terms of consumption and access to electricity at the level of some developing countries today. No doubt, a more strategic plan is needed in line with the forecast of population growth and the prospect of developing industries.

Conclusion

The energy reform is undoubtedly necessary for the country after almost 30 years of stagnation. However, reforms must be real and correlate with the country's ability to release them, despite the world's current trends, and no matter how much the state wants to develop more clean energy. It is most reasonable for Uzbekistan to start consistently, without shocks for the population, increasing the potential of existing power units and increasing electricity generation in general, even if at the initial stage it will be coal-fired. At the same time, it is necessary to develop a legislative framework for renewable energy and carry out privatization and deregulation of the market when all industries and populations will be ready for new clean energy sources.

Literature

- Abbott, M., Cohen, B., 2018. Finding a way forward: Policy reform of the Australian national electricity market. *Electr. J.* 31, 65–72. <https://doi.org/https://doi.org/10.1016/j.tej.2018.07.002>
- Ahmed, T., Bhatti, A.A., 2019. Do power sector reforms affect electricity prices in selected Asian countries? *Energy Policy* 129, 1253–1260. <https://doi.org/https://doi.org/10.1016/j.enpol.2019.03.012>
- Arciniegas, I., Barrett, C., Marathe, A., 2003. Assessing the efficiency of US electricity markets. *Util. Policy* 11, 75–86. [https://doi.org/https://doi.org/10.1016/S0957-1787\(03\)00003-1](https://doi.org/https://doi.org/10.1016/S0957-1787(03)00003-1)
- Asian Development Bank, 2015. *Assessment of Power Sector Reforms in Georgia*.
- Del-Rio, B., Fernandez-Sainz, A., Martinez de Alegria, I., 2019. Industrial electricity prices in the European Union following restructuring: A comparative panel-data analysis. *Util. Policy* 60, 100956. <https://doi.org/https://doi.org/10.1016/j.jup.2019.100956>
- Fotis, P., Karkalakos, S., Asteriou, D., 2017. The relationship between energy demand and real GDP growth rate: The role of price asymmetries and spatial externalities within 34 countries across the globe. *Energy Econ.* 66, 69–84. <https://doi.org/https://doi.org/10.1016/j.eneco.2017.05.027>
- Gencer, B., Larsen, E.R., van Ackere, A., 2020. Understanding the coevolution of electricity markets and regulation. *Energy Policy* 143, 111585. <https://doi.org/https://doi.org/10.1016/j.enpol.2020.111585>
- Hartley, P.R., Medlock, K.B., Jankovska, O., 2019. Electricity reform and retail pricing in Texas. *Energy Econ.* 80, 1–11. <https://doi.org/https://doi.org/10.1016/j.eneco.2018.12.024>
- Kaller, A., Bielen, S., Marneffe, W., 2018. The impact of regulatory quality and corruption on residential electricity prices in the context of electricity market reforms. *Energy Policy* 123, 514–524. <https://doi.org/https://doi.org/10.1016/j.enpol.2018.09.008>
- Letova, K., Yao, R., Davidson, M., Afanasyeva, E., 2018. A review of electricity markets and reforms in Russia. *Util. Policy* 53, 84–93. <https://doi.org/https://doi.org/10.1016/j.jup.2018.06.010>
- Littlechild, S., 2006. Foreword: The Market versus Regulation, in: Sioshansi, F.P., Pfaffenberger, W. (Eds.), *Electricity Market Reform*, Elsevier Global Energy Policy and Economics Series. Elsevier, Oxford, pp. xvii–xxix. <https://doi.org/https://doi.org/10.1016/B978-008045030-8/50001-1>
- Ozturk, I., Aslan, A., Kalyoncu, H., 2010. Energy consumption and economic growth relationship: Evidence from panel data for low and middle income countries. *Energy Policy* 38, 4422–4428. <https://doi.org/https://doi.org/10.1016/j.enpol.2010.03.071>
- Pirani, S., 2019. Central Asian Gas : prospects for the 2020s. <https://doi.org/10.26889/9781784671525>
- Toke, D., 2011. UK Electricity Market Reform—revolution or much ado about nothing? *Energy Policy* 39, 7609–7611. <https://doi.org/https://doi.org/10.1016/j.enpol.2011.08.061>
- U.S. Energy Information Administration, 2017. *International Energy Outlook 2017*. *Int. Energy Outlook IEO2017*, 143.
- Valadkhani, A., Nguyen, J., Smyth, R., 2018. Consumer electricity and gas prices across Australian capital cities: Structural breaks, effects of policy reforms and interstate differences. *Energy Econ.* 72, 365–375. <https://doi.org/https://doi.org/10.1016/j.eneco.2018.04.038>
- Woo, C.-K., Lloyd, D., Tishler, A., 2003. Electricity market reform failures: UK, Norway, Alberta and California. *Energy Policy* 31, 1103–1115. [https://doi.org/https://doi.org/10.1016/S0301-4215\(02\)00211-2](https://doi.org/https://doi.org/10.1016/S0301-4215(02)00211-2)
- Woo, C.K., Zarnikau, J., 2009. Will Electricity Market Reform Likely Reduce Retail Rates? *Electr. J.* 22, 40–45. <https://doi.org/https://doi.org/10.1016/j.tej.2009.01.003>
- Yergin, D., Gross, S., 2012. *Energy for Economic Growth*. World Econ. Forum 2.
- Decree of the President “On the strategy for further development and reform of the Republic of Uzbekistan’s electric power industry” dated March 27, 2019.
- Decree of the President “On measures to radically improve the management system of the fuel and energy industry of the Republic of Uzbekistan” dated February 1, 2019

Footnotes

¹ Transparency International. URL: <https://www.transparency.org/en/countries/uzbekistan> (date accessed: 11.11.2020)

² See for example. URL: https://www.azernews.az/oil_and_gas/54364.html and <https://www.refworld.org/docid/52f20719100.html> (date accessed: 11.11.2020)

³ See interview of the Minister of Energy of Uzbekistan to Petroleum Economist. URL: <https://www.petroleum-economist.com/articles/midstream-downstream/refining-marketing/2020/uzbekistan-plans-giant-leap-in-refining>