

# COVID-19 and the Power Industry Response: the Case of Kazakhstan

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## Introduction

Kazakhstan is a post-Soviet state with a population of 18.7 million living in a vast territory equal in size to Western Europe. However, the high level of urbanization concentrated in four major cities, large trade activities with China, non-visa regimes with Russia and neighboring Central Asian countries, and significant international business travel and tourism (i.e., about 95 thousand Kazakhstani travelers) have made the country highly exposed to the spread of the coronavirus (Kazakhstan government 2020a).

The government of Kazakhstan adopted its first measure to prevent the spread of coronavirus on 8 January 2020 by imposing medical controls on the border with China as well as restricting flights and canceling tourist visas for citizens of countries with the coronavirus epidemic. Such measures allowed Kazakhstan to mitigate the effect of the Wuhan coronavirus outbreak and to report zero cases of coronavirus during January-February 2020 (Kazakhstan government 2020a). However, the rapid escalation of the number of coronavirus patients in Europe forced the Kazakhstan government to adopt drastic measures and declare a one month national emergency from March 16th, 2020 (Kazakhstan president 2020a) with further full lockdowns from March 19th 2020 of its two main cities – its capital, Nur-Sultan, and financial center, Almaty (Kazakhstan government 2020b). From 4 April 2020, the local authorities of other Kazakhstani regions announced similar measures to respond to an increased number of COVID-19 cases (Kazakhstan government 2020c).

The preventive measures of the Kazakhstan government have resulted in minimizing the number of coronavirus cases with 1199 confirmed cases of the virus and 14 confirmed coronavirus deaths as of 14 April 2020 (Kazakhstan Ministry of Healthcare 2020). While the short-term effects of the Kazakhstan government's coronavirus policies have had minimal supply-side effects with no reports on related power supply disruptions, the sector has experienced moderate demand-side effects through the rapid contraction of economic activities. Additionally, the coronavirus pandemic has had an indirect impact on Kazakhstan power industry through transformation of its socio-economic environment and the government response policy. Finally, the rapid evolution of COVID-19 from a local outbreak to the global pandemic indicates a high likelihood of significant long-term implications for the electricity industry of transitional and developing economies.

## 1. Coronavirus pandemic and Kazakhstan

### economy

Kazakhstan is an upper middle-income country (per capita GDP US\$ 9,300 in 2018) where the industrial activity is dominated by oil and gas production, energy-intensive mining and metallurgical industries as well as coal fired power generation. The coronavirus pandemic and the global economic developments to the COVID-19 have four major economic challenges for the Kazakhstan power industry: increased unemployment, devaluation of local currency, economic decline and government economic sector response.

### Unemployment

The absence of a vaccine for COVID-19 has resulted in physical and social-distance policies imposed in the form of lockdowns to prevent the spread of coronavirus. These lockdowns have negatively affected about 81 percent of the global workforce and skewed towards low-income workers and small businesses (ILO 2020). Forecasts have estimated that the first phase of the battle to contain COVID-19 in Kazakhstan could result in more than 3 million people applying for special state benefit programs because of temporary or permanent layoffs (Kazakhstan President 2020b). Because of the losses of work or shutdown of businesses many people face challenges to meet their daily needs for food and medicine and pay their monthly accommodation and utility bills. As a result, both electricity tariffs and disconnections for electricity debts have become politically and socially sensitive issues during the emergency and the imposed lockdown.

### 1.2. Devaluation of local currency

The COVID-19 pandemic has become not only a threat to the health of Kazakhstan's people but also an economic challenge for oil exporting economies that are faced with the additional shock of oil demand contraction as a result of the economic slowdown and global lockdown restrictions. The demand shock is compounded by supply issues. Hence, since the beginning of the year, oil prices have fallen by 65.7% with forecasted Kazakhstani oil production during 2020 being reduced by 4 million tons to 86 million tons. Moreover, the prices of metals have decreased by an average of 15.6% (Kazakhstan Ministry of Economy 2020a). Both the oil and metal price shocks

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have caused the Kazakhstan currency to depreciate by 17% (from 382.59 KZT in January 1st 2020 to 447.67 KZT per dollar in April 1st 2020) despite a US\$1.487 billion currency intervention by the central bank in March 2020 (Kazakhstan National Bank 2020a, Kazakhstan National Bank 2020b).

### 1.3. Economic decline

As the result of reduced demand in global markets, Kazakhstan's exports will decline by US\$16.3 billion to US\$35.1 billion and imports will decrease by US\$7.5 billion to US\$26.6 billion. Kazakhstan's GDP is expected to decrease by 0.9% with forecasted annual inflation between 9 and 11% (Kazakhstan Ministry of Economy 2020a). The losses on revenues of the country's budget are estimated at US\$3.8 billion (Kazakhstan Ministry of Economy 2020b). To cover the shortfalls in budget revenues and to finance the anti-crisis state program, Kazakhstan's government intends to increase the guaranteed transfer from the National Fund (i.e., the country's sovereign oil fund) from US\$4.7 to US\$10.6 billion and borrow additional US\$3 billion in foreign capital markets (Kazakhstan Ministry of Finance 2020).

### 1.4. Economic response of Kazakhstan government

To the combat negative implications from COVID-19 pandemic Kazakhstan's government has launched an unprecedented economic response by offering a special state benefit programs for up to 3 million unemployed as well as a 10% annual raise for pensions. Furthermore, small and medium enterprises have been granted a three-month suspension for their tax payments. The agricultural sector will be provided with state loans and fuel subsidies for farmers equal to a 15% discount on market prices. In addition, the government has initiated electricity tariff reductions (Kazakhstan president 2020b). Finally, local authorities in some regions have requested not to apply disconnections for nonpayment of services or granted deferral of payments (Kazakhstan akimat 2020).

## 2. Kazakhstan power industry under COVID-19 pandemic

One of the distinctive features of the power industry response to the coronavirus outbreak is the need to address simultaneously two critical priorities of power infrastructure: 1) to ensure the safety of their employees; and 2) to provide reliable energy supply to their customers.

### 2.1. Employees' safety

The protection of the lives of employees during coronavirus pandemic is the priority in any industry (WHO 2020). However, the power industry has faced several challenges with the adoption of all safety recommendations. The first measure of Kazakhstani power companies, similar to other industries, has been

to improve the personal safety of their employees by providing correct information on COVID-19, distributing protective equipment, and increasing on-site cleaning. The second measure has been to ensure social distancing. This has resulted in meter reading, customer-centers and distribution of monthly billings being temporarily suspended. Despite both measures, the power industry has had problems with the adoption of distance working practices since only administrative support teams can work from home. While modern electronic systems of operation and control could potentially decrease the level of physical presence in the power industry, the existing power industry technologies, dominated by Soviet-designed coal-fired generation, has low levels of digitalization that prevent remote working practices by the majority of workers in the power industry.

Finally, while manufacturing companies in China, Europe and USA have adjusted their production levels to work below capacity or even temporarily closed their production to minimize risks for their employees (Campbell 2020) and some large Kazakhstan mining companies have developed plans for pre-emptive suspensions of one or more operations (Kazatomprom 2020a), similar temporary decreases of production or shutdowns in the electricity sector would impact the reliability of energy supply. Therefore, virus-related shutdowns in power infrastructure represent major risk threats to reliable electricity supply and should be avoided at any cost during the COVID-19 pandemic.

### 2.2. Reliability of electricity supply

The most important impact of the coronavirus is the recognition by both policymakers and society that electricity is a "public necessity". First, the public healthcare battle with the COVID-19 pandemic relies on modern medical equipment and requires a reliable power supply. As a result, the most important performance indicator of the work of any electricity company during the coronavirus outbreak is the absence of reported incidents of major power supply outages. In addition, a reliable power supply becomes critical to support not only direct household needs of the lock-downed citizens but also to ensure the operation of other communal services such as heating, ventilation, water supply, fire-protection system, and security. Moreover, state emergency communication, entertainment and social interactions of people during coronavirus outbreak have become heavily dependent on digital infrastructure that is based on a reliable energy supply. Finally, public order and crime prevention are based on street lighting, surveillance and systems of monitoring, which all require a stable electricity supply.

The Kazakhstani government's imposed lockdown can be only effective if the citizens have uninterrupted electricity, water and heat in their apartments and homes. Therefore, any disruption of the energy supply during COVID-19 pandemic may have greater

consequences because of increased threats to the health of population and risk of the social instability (in case of disconnection of hospitals, prisons, etc.).

### 2.3. Financial resilience

The need to provide a reliable supply of electricity requires the financial sustainability of the power industry. In comparison with the service sectors, the power industry has not been affected directly by both the COVID-19 pandemic and corresponding lockdown measures. Nevertheless, the power industry has not been immune to the indirect economic implications of COVID-19 pandemic. First, the power industry has had to address a decrease in power demand from reduced economic activities from a contracted service sector and transportation in lockdown regions. For example, in Nur-Sultan city power demand has dropped after the lockdown by more than 30% from 12 to 8 million kwh/day (Krivosheev 2020). Second, while the lockdown of the major cities has not changed the overall structure of power demand in Kazakhstan because: 1) mining consumers, the major consumers of power, have not stopped production; 2) government restrictions in lockdown cities did not affect many industries; 3) increased household power demand has partially compensated for the reduction of demand from the service sectors, there has been a growing risk of decline of power demand from energy-intensive manufacturing and oil processing facilities because of global recession (Kazatomprom 2020b). Finally, there is an issue of how to secure the necessary level of power supply revenue stream without deteriorating the living conditions of vulnerable households (Demidov 2020). This is especially important as regional authorities have granted deferral for monthly electricity bills or restricted disconnection for non-payments. Therefore, COVID-19 pandemic represents a challenge to the financial viability of Kazakhstan power industry.

### 3. Long term implications for the power industry

The long-term implications of the COVID-19 pandemic for the power industry depend upon assumptions of the public health capacity to control the spread of the coronavirus, government measures to stimulate economic activity, public support of quarantine measure, and global economic response. At the same time, the rapid spread of a new virus may become a new reality of modern world because of poverty in the developing world and increased business travelling and mass tourism in advance economies compounded with climate change. A reoccurrence of the COVID-19 pandemic can be expected in case the virus proves to be seasonal, the virus mutates or limited "herd immunity" to the virus (Rossman 2020). In these cases, the COVID-19 virus will have a prolonged impact on the global economy with negative implications on power industry development. Besides, the negative implication of the pandemic may be escalated by geopolitical tensions, inappropriate

government interventions, and overreaction of global markets which may lead to wide-scale bankruptcy, unemployment, financial crises, social unrest and political crises (Craven et al 2020). Finally, the situation may be escalated with extreme climate events compounded with disruption of the supply of food, medicine, fuel and energy to become an "ideal storm" scenario.

#### 3.1. Increased government involvement in power markets

The increased importance of electricity supply during an emergency, such as the coronavirus outbreak, and recognition by society and government of electricity as "public necessity" may result in delays with planned market reforms and privatization in power sectors in developing countries and even increase pressure for nationalization and increased state regulation of the electricity sector around the globe. In the situation of an emergency, governments often impose price controls on critical goods and services, and even direct the market (BBC 2020). Moreover, some governments accuse private manufacturers for being non-responsive to increased demand for air ventilators (Netland 2020). As a result, the electricity sector could remain under strict government price regulation or there could be an increased role of the government to maintain control over prices and disconnections by the energy suppliers.

#### 3.2. Economics and power demand

On the one hand, economic crises lead to the decline of power demand and decrease in traditional investment activities. The cancellation or delay of new power projects is expected. Besides, reduced demand for oil may result in a decline of natural gas prices which creates downward pressure on electricity prices even without state intervention. Furthermore, the devaluation of local currencies in oil-exporting economies extends the payback periods of new power projects and reduces the profitability of existing projects with foreign-currency debt financing. Moreover, the economic decline could lead to a high level of unemployment and wide-scale bankruptcy which would deteriorate collection for electricity supply companies.

On the other hand, the coronavirus pandemic will promote consumers and investors to shift to distance learning, working, services, production and consumption. Increased investments into digitalization and adoption of automation could lead to an increase in power demand and increase the requirement to the quality of the power supply.

#### 3.3. Energy security

The COVID-19 pandemic has been characterized by minimal international cooperation, unilateral restrictions by many countries of international travel and trade, intense competition between the large

economies for medical equipment, protective gear and medicine, and increased defaults from foreign suppliers to meet their commitments to third countries (Efrati 2020). Besides, many developing countries have had to respond to the coronavirus outbreak by using their limited domestic medical capacities without any significant international support (Bradley 2020). As a result, the traditional debate on energy security may be intensified with increased empirical evidence of the importance of self-reliance, the need for adequate domestic capacities and failures of international cooperation during a critical situation such as the coronavirus pandemic.

### 3.4. Renewable energy

An increase of state intervention in the electricity market and high demand from the digital sector for reliable power supply may increase the role of traditional generation (i.e., coal-fired) and reduce the focus of the government on promoting renewable energy. At the same time, the increased demand from the consumer side (i.e. IT and telecommunication firms, households, farmers, etc.) for renewable energy self-generation and accumulation of energy can be expected because of a stronger preference for energy autonomy.

### 3.5. Climate change

Due to reduced economic activity as the result of the economic crisis that accompanied the COVID-19 pandemic, environmental issues and particular climate change may be considered as less important for government and public than the reliability of energy supply and economic recovery. Therefore, some policies mandating early termination of coal-fired generation may be delayed. Besides, cheap electricity from existing coal-fired generation and natural gas power plants could be considered as a measure to stimulate the economy and provide energy access to a vulnerable group of consumers. At the same time, the coronavirus pandemic has challenged the capacity of modern society to respond to external shocks and revealed the urgent need for better international cooperation to mitigate common threats.

### 3.6. Energy reliability

The power companies need to focus on health of their employees and conduct regular testing of workers. Training of additional people for critical jobs (such as control-room operators and maintenance teams) could minimize the impact of the possible quarantine of the personnel on electricity supply. Besides, sufficient inventory of critical spare parts and fuel is needed to mitigate possible disruptions of supply. Moreover, additional contingency plans should be developed to address the possible outbreak of COVID-19 among contractors and delays in construction and major overhauls (Rosatom 2020). Finally there is an urgent need to reinforce the security

of the power infrastructure because any power outage may trigger crime and social disorder.

## Conclusion

The coronavirus pandemic has resulted in about a half of the world's population being under lockdown (Sandford 2020). The combination of self-isolation of the majority of the population and social order can only be achieved if the power industry can provide a reliable electricity supply. Therefore, the security of the power supply becomes one of the most critical but not well-recognized aspects of the battle against the COVID-19 pandemic. Nevertheless, the power sector's employees are not invincible, and they can be affected by the spread of the coronavirus and by this, in turn, reduce the reliability of power supply. As a result, it is critical to protect the workers of the power industry from the virus. In addition, while the power industry is not directly affected by lock-down as other sectors of economy, the financial status of power companies will be affected because of low demand, low collections and rigid tariff control. Therefore, there is a need to reassess the risks faced by the investors in the power industry because of the escalation of the costs of power supply failure as a result of the transformation of electricity from a commodity to a social necessity.

Finally, the COVID-19 pandemic may have long-term impacts on power industry development by challenging the traditional theoretical concepts and policy solutions related to the role of government in electricity sector, energy security, digitalization of economy, and climate change. Therefore, power industry should be ready for a fast transformation to meet the new requirements of post-COVID-19 world.

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