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# Kazakhstan: Derisking Renewable Energy Investment

## Key Points for Decision-Makers<sup>1</sup>

The objective of this report is to analyse the most cost-effective public derisking measures to promote private sector investment in utility-scale renewable energy in the Republic of Kazakhstan (“Kazakhstan”). Target sectors are wind energy and solar photovoltaic (PV). The report sets out the results from a quantitative, investment-risk informed modelling analysis. Modelling data has been obtained from structured interviews with private sector investors and developers. This report was prepared in collaboration with Kazakhstan’s Ministry of Energy.

## Context and Opportunity for Renewable Energy

Kazakhstan’s power sector currently relies heavily on fossil fuels, reflecting the country’s endowment with an abundance of oil, natural gas, and coal reserves. Total available capacity for electricity generation is 18.8 GW, with nearly 75% of the plants being powered by locally-sourced coal. Rapid economic growth in the past decade has led to increases in electricity demand, but the country faces constraints in an aging generation and transmission infrastructure dating to the Soviet-era. Kazakhstan has some of the lowest retail tariffs in the world, a function of consumption subsidies for fossil fuels (estimated at USD 5.3 billion in 2014), low-cost generation from fully-depreciated power plants, and non cost-reflective tariff pricing. Kazakhstan is also characterized by regional imbalances in generation, notably in the south, resulting in supply disruptions and electricity imports from neighbouring countries.

The potential for renewable energy in Kazakhstan is strong. This report assumes investment targets for 2021 (5 years) of 1 GW in wind energy and 250 MW in solar PV. These targets can be viewed as the first, phased step to achieving the government’s official 2030 targets of 5 GW in wind energy and 500 MW in solar energy, as set out in its Green Economy Concept Note (2013). Kazakhstan is well positioned for investment with abundant wind resources and a compelling case for solar PV in the south, around Almaty. Increased investment in renewable energy can contribute to Kazakhstan’s long-term vision to establish itself as a regional leader in green economic development, to its goal to diversify electricity generation away from oil and coal, and to reducing greenhouse gas emissions in line with its Nationally Determined Contribution (NDC) under the UNFCCC.

“Kazakhstan is well positioned for renewable energy investment, with abundant wind resources and a compelling case for solar PV in the south”

## More on Kazakhstan: Derisking Renewable Energy Investment



An executive summary version and the full version of this report in both Russian and English, as well as its financial models, are available to download at: [www.undp.org/DREI](http://www.undp.org/DREI)

This ‘Key Points’ document was first published in June 2018.

<sup>1</sup> This ‘Key Points for Decision-Makers’ summarises the findings of the report in succinct manner. As such literature references have not been included here, but are found in the more detailed ‘Full Report’ version.

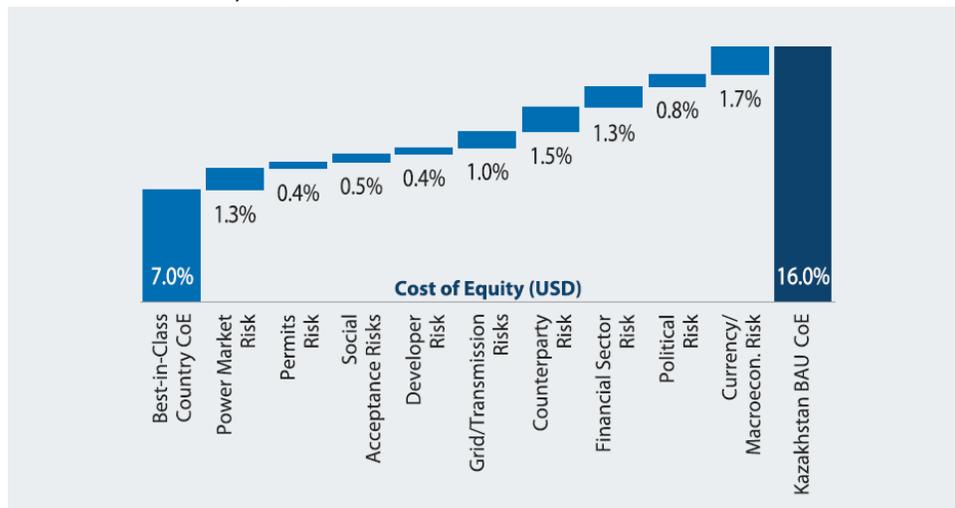
## Financing Costs and Risk Environment

The modelling performs a detailed analysis of the financing costs and risk environment for wind energy and solar PV in Kazakhstan today.

“Power market risk, counterparty risk, financial sector risk, and currency and macroeconomic risk contribute most to higher financing cost”

- Financing costs (the cost of equity and the cost of debt) are high in Kazakhstan. Based on interviews with investors, the present study estimates, for example, that the cost of equity<sup>2</sup> for utility-scale wind energy and solar PV in Kazakhstan today is 16% (USD), compared with 7% in Germany. Investors in utility-scale renewable energy projects in Kazakhstan are also hindered by less attractive capital structures (equity to debt ratios).
- These higher financing costs reflect a range of investment risks for wind energy and solar PV in Kazakhstan (Figure 1, below). Four risk categories were found to contribute most to higher financing costs: 1) “power market risk” related to limitations in the feed-in tariff mechanism and a lack of a bankable PPA, 2) “counterparty risk” that concerns the credit-worthiness of the Financial Settlement Centre, the electricity off-taker, 3) “financial sector risk” relating to the scarcity of capital from international and domestic markets, and 4) “currency and macroeconomic risk” related to the fluctuations in the Kazakh Tenge vis-a-vis hard currencies in which financing is denominated. A number of other risk categories also contribute to higher financing costs.

**Figure 1: Impact of risk categories on the cost of equity for wind energy and solar PV investment in Kazakhstan, business-as-usual scenario**



Source: interviews wind energy and solar PV investors and developers; modelling; best-in-class country is assumed to be Germany; see: Full Report and the Appendices therein for details

## Public Derisking Measures

For wind energy and solar PV, the modelling examines the selection and cost-effectiveness of public derisking measures to meet the report’s 2021 (5 year) investment targets. Public derisking measures can be understood as interventions by the government and its partners that address specific investment risks, in the form of policies, programmes or financial products.

<sup>2</sup> USD-denominated cost of equity.

“Derisking creates savings for Kazakhstan of USD 276m (wind), and USD 54m (solar PV), until 2021”

- For wind energy, (2021 investment target: 1 GW), the modelling estimates the cost of public derisking measures at USD 276 million until 2021. These derisking measures result in the following potential benefits:
  - Catalysing USD 1.6 billion in private sector investment in wind energy, while saving USD 311 million in avoided fossil fuel subsidies over the lifetime of the wind energy assets.
  - Lowering wind energy generation costs (LCOEs) due to derisking from USD 9.2 cents to USD 7.1 cents per kWh.
  - Creating economic savings related to derisking of wind energy of USD 805 million over 20 years.
  - Reducing carbon emissions by 56.3 million tonnes of CO<sub>2</sub> over 20 years, relative to the baseline.
- For solar PV, (2021 investment target: 250 MW), the modelling estimates the cost of public derisking measures at USD 54 million until 2021. When implemented, this results in the following benefits:
  - Catalysing USD 325 million in private sector investment in solar PV, while saving USD 33 million in avoided fossil fuel subsidies over the lifetime of the solar energy assets
  - Lowering solar PV generation costs due to derisking from USD 16.9 cents to USD 13.0 cents per kWh
  - Creating economic savings related to derisking of solar PV of USD 161 million over 20 years
  - Reducing carbon emissions by 6.0 million tonnes of CO<sub>2</sub> over 20 years, relative to the baseline

**Table 1: The selection of public measures to achieve the targets for wind energy and solar PV**

Risk Category	Policy Derisking Instrument	Financial Derisking Instrument
<b>Power Market Risk</b>	<ul style="list-style-type: none"> <li>• Update transparent, long-term national renewable energy strategy</li> <li>• Establish and run IPP bidding process, with bankable PPA</li> <li>• Establish a renewable energy office in the regulator</li> </ul>	NA
<b>Permits Risk</b>	<ul style="list-style-type: none"> <li>• Streamlined process for RE permits (dedicated one-stop shop)</li> <li>• Contract enforcement and recourse mechanisms</li> </ul>	NA
<b>Social Acceptance Risk</b>	<ul style="list-style-type: none"> <li>• Awareness-raising campaigns</li> </ul>	NA
<b>Developer Risk</b>	<ul style="list-style-type: none"> <li>• Technology R&amp;D</li> <li>• Support for industry associations</li> </ul>	NA
<b>Grid/Transmission Risk</b>	<ul style="list-style-type: none"> <li>• Strengthen KEGOC's grid management capacity</li> <li>• Transparent, up-to-date grid code</li> <li>• Policy support for long-term national transmission/grid road-map</li> </ul>	<ul style="list-style-type: none"> <li>• Take-or-pay clause in PPA</li> </ul>
<b>Counterparty Risk</b>	<ul style="list-style-type: none"> <li>• Reform and maintain creditworthy Financial Settlement Centre structure</li> </ul>	<ul style="list-style-type: none"> <li>• Government guarantee for PPA payments</li> <li>• Public loans to IPPs</li> </ul>
<b>Financing Risk</b>	<ul style="list-style-type: none"> <li>• Fostering financial sector reform towards green infrastructure investment</li> <li>• Strengthening financial sector's familiarity with renewable energy and project finance</li> </ul>	<ul style="list-style-type: none"> <li>• Public Loans to IPPs</li> </ul>
<b>Political Risk</b>	NA	NA
<b>Currency/Macro-economic Risk</b>	NA	<ul style="list-style-type: none"> <li>• Partial indexing of the PPA tariff to hard currencies</li> </ul>

Source: Modelling. NA indicates "Not Applicable"

## Conclusion

“Public derisking measures are an opportunity towards more reliable, affordable and clean power for Kazakh citizens”

Today’s investment environment for renewable energy in Kazakhstan reflects a number of investment risks that result in high financing costs. The report’s methodology systematically identifies public derisking measures to target these risks, thereby lowering financing costs and resulting in lower generation costs.

The results demonstrate how investing in public derisking measures creates significant economic savings, both in meeting this report’s 2021 (5 year) investment targets, as well as the official 2030 targets. The modelling clearly shows that investing in public derisking measures should in every case be more cost-effective for Kazakhstan, compared to an alternative of paying higher generation costs.

In recent years Kazakhstan has put in place a number of derisking measures to promote renewable energy. The opportunity for policymakers in Kazakhstan is to now pursue further derisking, both reforming the design of existing measures and implementing new measures, targeting unaddressed investment risks. By derisking the investment environment to meet this report’s 2021 (5 year) targets, this can then kick-start the utility-scale investment flows necessary to achieve the official 2030 targets. The end result can be more reliable, affordable and clean power for Kazakh citizens.