

## **Green New Wave: How China Adapts to Central Asia's Renewable Energy Landscape**

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### **Introduction**

Traditionally, in Central Asia, China has been known for its investments in massive infrastructure and fossil fuel projects, such as the China–Central Asia gas pipeline projects, or the construction of the Angren–Pap electrified railway in Uzbekistan.<sup>1</sup> But since 2018, there has been a notable increase in China's involvement in renewable energy projects in Kazakhstan and Uzbekistan, in parallel with traditional energy sector projects.<sup>2</sup>

On the surface it might be assumed that this shift happened because of Beijing's new focus on a “Green” Belt and Road Initiative.<sup>3</sup> However, the primary motivation derives from Kazakhstan and Uzbekistan's growing interest in renewable energy, prompted by concerns about energy insecurity and environmental pollution from conventional energy sources.<sup>4</sup>

China's approach to this renewable energy collaboration differs between Kazakhstan and Uzbekistan, showcasing adaptable strategies within Central Asia.

### **The Two Drivers**

Historically dependent on fossil fuels, Kazakhstan and Uzbekistan are turning to solar and wind power to reduce the environmental impact associated with traditional energy production and consumption.<sup>5</sup> Security considerations are another reason for this shift.

Energy shortages in both Kazakhstan and Uzbekistan threaten their energy security, forcing both countries to prioritize renewable sources. Despite significant traditional energy resources, Kazakhstan faces shortages due to a gap between gas processing capacity and population growth, while Uzbekistan faces energy deficits amid declining gas production.<sup>6</sup>

Moreover, in the background of energy shortages, Moscow's increasing pressure on Kazakhstan and Uzbekistan to import more gas from Russia since the start of its full-scale invasion of Ukraine in 2022 is another reason to shift to renewable energy sources. In the long term, renewables are seen as a useful energy source to reduce these countries' dependence on Russia and ensure their energy security.<sup>7</sup>

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Kazakhstan and Uzbekistan are now emerging as key drivers of the shift to renewable energy in the region, with a particular focus on solar and wind power projects. In Uzbekistan, solar and wind power accounted for only about 253 megawatts (MW) or 1 percent of total renewable energy capacity in 2022.<sup>8</sup> By 2030, Uzbekistan aims to increase solar and wind capacity by 5 gigawatts (GW) and 3 GW, respectively.<sup>9</sup>

Kazakhstan successfully met its interim target of generating 3 percent of its electricity from renewable sources by 2020. Solar and wind power accounted for 23 percent and 22 percent, respectively, of Kazakhstan's total renewable energy capacity in 2022.<sup>10</sup> Kazakhstan has set clear targets for renewable energy sources development, aiming to generate 15 percent of its electricity from renewables by 2030 and 50 percent by 2050.<sup>11</sup>

In this context, two factors play key roles in pushing China to get involved in Kazakhstan and Uzbekistan's growing interest in renewable energy projects.

The first factor revolves around Kazakhstan and Uzbekistan's increasing focus on green energy cooperation, reflected in their diplomatic agendas and key bilateral agreements with China. The intergovernmental framework agreement signed between Kazakhstan and China in 2015 aimed to strengthen cooperation in industrialization and investment, leading to a number of joint projects, including renewable energy projects.<sup>12</sup> In Uzbekistan, green energy was highlighted as a priority area of cooperation in the 2022 strategic partnership with China, leading to an intergovernmental agreement on renewable energy cooperation in 2023.<sup>13</sup>

Kazakhstan and Uzbekistan's increased emphasis on renewable energy as a potential area of cooperation is a critical driver factor for Chinese companies to align with the interests of regional countries. However, a diplomatic agenda is not the only factor that attracts Chinese companies to get involved in Kazakhstan's renewable energy sector.

The second driver relates to the development of renewable energy regulations. In 2018, Kazakhstan initiated renewable energy auctions,<sup>14</sup> while Uzbekistan began permitting renewable energy project cooperation within public-private partnership initiatives starting in 2019. These partnerships can be established through tenders or direct negotiations. Both nations offer various incentives for renewable energy projects, including tax exemptions and subsidies.<sup>15</sup>

The development of a regulatory framework plays a critical role in attracting China to participate in renewable energy projects in both countries. It opens alternative avenues of participation for Chinese companies, allowing them to play different roles in the projects,

such as project developers; engineering, procurement, and construction (EPC) contractors; or suppliers to multiple projects. It also improves the bankability of renewable energy projects in both countries.

The growing demand for renewable energy in Kazakhstan and Uzbekistan also aligns with China's evolving global investment framework and is prompting changes in China's investment strategy, particularly in response to concerns about debt sustainability and environmental impacts associated with large-scale Belt and Road Initiative (BRI) projects.<sup>16</sup>

Since the second Belt and Road Forum for International Cooperation in 2019, China has emphasized environmental considerations, leading to the promotion of a "Green" BRI. A directive issued in November 2021 emphasized a shift from large-scale fossil fuel and infrastructure efforts to smaller, more sustainable projects that include scalable solar and wind energy.<sup>17</sup>

This convergence of interests has not only encouraged China to engage with Central Asian countries' growing interest in renewable energy, it has also spurred efforts to increase Chinese companies' market share in Central Asia since 2018.

## Step by Step

China's investment in renewable energy in Central Asia can be divided into two phases.

During the first phase, from the 1990s to 2018, in parallel with traditional energy projects, China mostly focused on large hydropower projects (HPPs) in the region, with an emphasis on helping downstream Kazakhstan and Uzbekistan harness their hydropower potential.<sup>18</sup>

Chinese companies were primarily involved in projects through debt financing from

institutions such as the China Exim Bank (CEB) and the China Development Bank (CDB).<sup>19</sup>

For example, China National Electric Equipment Corp. provided turnkey equipment for the Andijan hydropower plants in Uzbekistan, which were completed in 2010. Part of the project financing came from the CEB, which provided a \$15.93 million loan with a government guarantee.<sup>20</sup> Another notable agreement came in 2017, when Uzbekistan's Turonbank secured a \$58.5 million, twenty-year loan from the CEB to finance the modernization of four HPPs, including the Kamolot and Kadirin HPPs, both of which fully exploit the country's domestic water resource advantages, further balance its electricity structure, and reduce power generation costs.<sup>21</sup> In Kazakhstan, a significant project during this period was the Moinak HPP completed by China International Water & Electric Corporation. The Moinak HPP, which cost \$330 million, received a \$200 million loan from the CDB.<sup>22</sup>

In the second phase, starting in 2018, China shifted its involvement in the Central Asian renewable energy market away from large HPP projects to focus on wind and solar projects.<sup>23</sup> This shift was accompanied by a change in project financing. Since 2018, there has been a shift toward equity financing from Chinese renewable energy companies and increased collaboration with local multilateral development banks, displacing debt financing from Chinese banks in the renewable energy sector.<sup>24</sup>

The evolution of China's corporate involvement is closely linked to the changing preferences of local governments in Kazakhstan and Uzbekistan. These countries are increasingly prioritizing wind and solar power projects due to the declining costs of solar and wind technologies compared to large-scale HPPs and the adverse effects of climate change on hydro resources.<sup>25</sup>

The shift in financing patterns, in parallel, is closely linked to growing dissatisfaction with

China's debt financing in the region, aligning with the adoption of more conservative lending policies by Chinese policy banks globally.<sup>26</sup> After 2018, there has been a decline in debt financing via Chinese development banks but a growing tendency for Chinese companies to participate in renewable energy projects mostly through equity financing, particularly in Kazakhstan.<sup>27</sup> Furthermore, Chinese companies' involvement in the renewable energy market in Central Asia extends beyond direct equity investment, encompassing roles as EPC contractors or suppliers in various projects, particularly in Uzbekistan.

However, despite the general change in China's involvement in the renewable energy sector concerning both renewable energy types and financing, this does not imply a uniform strategy adopted in both countries. In this regard, despite China's adaptation to Uzbekistan and Kazakhstan's growing interest in renewable energy projects, Chinese companies' method of involvement differs for each country.

## Kazakhstan

The growing demand for renewable energy projects in Kazakhstan serves as the primary driver factor for Chinese companies. The 2015 intergovernmental framework agreement between China and Kazakhstan has facilitated Chinese companies' participation in various renewable energy initiatives. Chinese companies have mostly played the role of project developers and constructors in renewable energy projects in Kazakhstan. Financing for these projects comes mainly from local or multilateral development banks, in addition to equity financing of Chinese companies.<sup>28</sup>

The Zhanatas and Shelek wind farm projects exemplify distinct endeavors established through intergovernmental agreements and financed by local Kazakh banks and multilateral institutions. Zhanatas Wind Farm is being developed, constructed, and operated by

Zhanatas Wind Power, a wholly foreign-owned company jointly established by Chinese state-owned China Power International Holding (80 percent) and United Arab Emirates-based private equity firm Visor International. Seventy percent of the project's funding comes from a loan provided by a consortium of international financial institutions, including the European Bank for Reconstruction and Development (EBRD) and the Asian Infrastructure Investment Bank (AIIB).<sup>29</sup>

Another example, the Shelek Wind Farm project in Kazakhstan, is owned and invested in by Chinese state-owned PowerChina and Kazakh state-owned Samuk-Energy Joint Stock Company, with financing sourced from the CDB and the Development Bank of Kazakhstan (DBK).<sup>30</sup>

Between 2018 and 2022, Chinese companies contributed to the development of five wind power projects and three solar power projects as part of a Kazakh-Chinese program of industrial and investment cooperation.<sup>31</sup> These projects are examples of how Chinese companies are adopting local practices by participating in auctions to synchronize with key capacity and investment initiatives.

In contrast to directly selected projects such as the Zhanatas Wind Farm, private Chinese company Universal Energy has actively participated in renewable energy auctions since its inception in 2018. Through this approach, the company has secured contracts for the construction of wind and solar power plants across Kazakhstan.<sup>32</sup> For example, Universal Energy has successfully constructed three solar power plants (Kaskelen, Kapchagay, and Zhangiztobe) as well as three wind power plants (Abay 1, Abay 2, and Ybrai).<sup>33</sup> Financing for all wind power plants and two solar power plants came from the DBK and Universal Energy's equity financing.<sup>34</sup> The third solar power plant, in Zhangiztobe, received financing from the EBRD and Universal Energy's equity financing.<sup>35</sup>

China's involvement in Kazakhstan's renewable energy sector now goes beyond mere project participation and includes compliance with Kazakhstan's localization demands. The intention of China's state-owned State Power Investment Corporation to begin manufacturing equipment for wind power plants in Kazakhstan is a good example of Chinese companies adapting to local government requirements.<sup>36</sup>

## Uzbekistan

While Kazakhstan has relied primarily on government-to-government relations to advance renewable energy projects, the establishment of a green diplomatic agenda between China and Uzbekistan did not emerge until after 2021. Even before this formalized agenda, however, China had a presence in Uzbekistan's renewable energy sector.

The main impetus for Chinese companies came from the launch of renewable energy tenders in Uzbekistan starting in 2019, which piqued Chinese companies' interest. Although Chinese companies have actively participated in the tender process, they have not been able to win contracts due to the competitive tariff proposals offered by their counterparts, especially Masdar, a state-owned company from the United Arab Emirates, and ACWA Power, a private Saudi company.<sup>37</sup>

Only one Chinese company—GD Power-PowerChina—won its bid to build a 150 MW photovoltaic plant in the Namangan region in 2022 with a bid of 4.828 U.S. cents per kilowatt-hour of electricity generated, but the project tariff was considered too high and subsequently canceled.<sup>38</sup>

However, these challenges have not dissuaded Chinese companies from engaging in the Uzbek market, and they have adopted two distinct strategies to participate in major projects.

First, while tender-winning companies fulfil roles as developers, investors, and operators of power generation, Chinese companies have involved themselves in projects through EPC contracts or as suppliers. For instance, Masdar developed Uzbekistan's first utility-scale photovoltaic power plant, with SEPCOIII (a PowerChina subsidiary) providing EPC services after winning the contract in 2019.<sup>39</sup> This pattern extends to wind power projects, like the Bash and Dzhankeldy wind power projects developed by ACWA Power, with the EPC contract signed by state-owned China Energy Engineering Corporation (CEEC).<sup>40</sup>

Chinese companies also serve as significant suppliers for renewable energy projects, with agreements signed between Masdar and Goldwind of China for the supply of turbines for wind power plants under construction in the Tomdi district.<sup>41</sup> China's Envision Energy is supplying turbines to ACWA Power's Bash and Dzhankeldy onshore wind farms. In addition, for the ACWA Power solar project in Tashkent, China's JA Solar has supplied all n-type modules, which are a type of PV module leveraging phosphorus chemistry for more efficient conversion of sunlight into electricity.<sup>42</sup>

The second strategy adopted by Chinese companies involves engaging in direct negotiations to develop renewable energy projects in Uzbekistan, which gained momentum in 2022 amid the growing emphasis on green energy cooperation between China and Uzbekistan.<sup>43</sup>

According to the Law of Uzbekistan on Public-Private Partnerships, project partners can be selected through tenders or direct negotiations.<sup>44</sup>

In this context, CEEC Energy China, Huaneng Renewables Corporation, and Poly Technologies each signed agreements with the Uzbek Ministry of Energy in 2023 to build 2,000 MW of solar photovoltaic power plants in the Kashkadarya, Bukhara, and Samarkand regions, and another 2,000 MW in the Jizzakh and Tashkent regions. Taken together, these projects represent \$4 billion in direct investment.<sup>45</sup> The conventional practice of

international tenders for solar and wind power projects that has been established in recent years did not apply to these projects; Chinese companies were selected directly.

Another example of direct negotiations is the memorandum of understanding (MoU) signed in 2023 between Uzbekistan's Ministry of Energy and the Chinese companies China Huadian Overseas Investments, China National Electric Engineering Company, and SANY Renewable Energy.<sup>46</sup> This MoU aims to explore the potential for the construction of wind farms with a capacity of up to 1,000 MW in the Jizzakh region. Under another agreement, PowerChina is about to build a 400 MW photovoltaic power plant in the Andijan region.<sup>47</sup>

Like with Kazakhstan, China appears to be aligning with Uzbekistan's demand for the localization of its renewable energy requirements. Examples of China's responsiveness to local government demands in the field of renewable energy are the preliminary agreements between China's Liaoning Lide Investment Holdings Group and the Republic of Karakalpakstan, an autonomous republic within Uzbekistan, for the production of renewable energy equipment in 2023.<sup>48</sup>

## Opportunities and Risks

Since 2018, China's significant involvement in solar and wind energy projects in Kazakhstan and Uzbekistan has garnered considerable attention. This increased involvement is primarily driven by pull factors emanating from both countries, which compel China to adapt to their renewable energy interests in the following ways.

First, amidst an escalating demand for renewable energy sources in both countries, China is actively embracing their green energy agenda and has increased its involvement in various projects since 2018.

Second, China not only participates in these projects, but has also responded to countries' growing concerns about Chinese development banks' debt financing by adopting alternative forms of financing, such as equity financing from Chinese companies, and by actively cooperating with local and multilateral development banks.

Third, the intention of Chinese companies to start production of renewable energy equipment in Kazakhstan and Uzbekistan proves China's increasing adaptation to the localization demands of countries.

Finally, despite China's involvement in renewable energy projects in both Kazakhstan and Uzbekistan, it is adopting different local practices and rules in each country. The divergence in strategies stems from differences in the availability of engagement mechanisms, whether through government-to-government channels or through tender/auction processes. In Kazakhstan, the impetus for Chinese companies to engage in renewable energy projects was primarily driven by the government-to-government green agenda. In Uzbekistan, on the other hand, tenders have been the main driver for Chinese companies to enter the market. In addition, Chinese companies play different roles in these projects depending on the presence of different stakeholders. In Kazakhstan's renewable energy market, Chinese companies mainly act as project developers. Conversely, in Uzbekistan, due to the presence of various competitors such as ACWA or Masdar, Chinese companies adopt different practice and participate as EPC contractors or input suppliers.

While China's involvement in the renewable energy sectors in Kazakhstan and Uzbekistan differs, its increasing influence creates opportunities and risks for both countries. China's active involvement presents significant opportunities for accelerating the green transition in both Kazakhstan and Uzbekistan, thereby aiding in the reduction of environmental pollution through the adoption of clean energy solutions. Moreover, by supporting renewable energy

projects, China assists both countries in bolstering their energy independence, particularly crucial amid escalating domestic gas shortages and a growing reliance on gas imports from Russia.

On the other hand, the active involvement of Chinese companies in renewable energy projects has the potential to spread Chinese standards in the green energy sector. This may limit competition with and involvement by other international companies in renewable energy projects in Central Asia. While China encourages the use of Chinese technologies and materials as a strategy to promote domestic industries, Western countries prefer to engage with a range of stakeholders to import materials or acquire technological know-how, aiming for broader participation and potentially offering a wider range of solutions.

Universal Energy's project in Kazakhstan is a notable example of China's approach to renewable energy projects. In the Kapchagay photovoltaic power plant project, the company adopted the "100% Made in China, 100% Construction in Kazakhstan" model, using Chinese technological know-how and equipment to complete the project.<sup>49</sup>

The increasing dominance of Chinese firms in the market and the growing reliance on Chinese technology and expertise in Central Asia may lead to an excessive dependence on Chinese resources. While Central Asia could transition to green energy with substantial assistance from China, an escalating dependence on Chinese technology could extend China's influence beyond mere economic investment, potentially positioning it as a key rule-maker in the green energy sector.

Potential regulations may involve China imposing its own technology standards for renewable energy projects in Uzbekistan and Kazakhstan, necessitating the adoption of equipment and technologies manufactured by Chinese companies. Additionally, China might

impose conditions on its investment renewable energy projects, such as requiring the involvement of Chinese contractors and subcontractors. There is, therefore, a need to carefully consider the long-term implications of China's increasing influence in Central Asia's renewable energy landscape.

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