



Structural Transformation Through a Multi-vector Geo-economic Governance? BRI and Upgrading of the Uzbek Gas Industry

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Abstract

Gas is a strategic source of energy and Uzbekistan ranks 11th in the world for mining and 14th for reserves. The article investigates whether and how the BRI and Chinese capital have contributed to Uzbek structural transformation in the gas industry. It argues that although the Chinese BRI seems to adopt an extractive approach to acquire natural resources, its interventions are also an opportunity for multi-directional forms of upgrading in the gas sector, both directly and indirectly. Directly, first the Chinese involvement as a consumer has reconfigured geo-economic power relations around gas. Secondly, there is an unprecedented support by China to national infrastructure development, both as a lender and a producer. Thirdly, China is the main source of machineries to enable energy transmission. Despite these factors, BRI and the Chinese presence are contributing only marginally to upgrading. A coordinated industrial strategy coming from the Uzbek state remains a necessary condition for structural transformation.

Keywords Energy · BRI · Structural transformation · Upgrading · Gas · Uzbekistan · Infrastructure

Résumé

Transformation structurelle par une gouvernance géo-économique multi-vecteur ? BRI et modernisation de l'industrie gazière ouzbèke Le gaz est une source d'énergie stratégique et l'Ouzbékistan se classe 11ème dans le monde pour l'exploitation minière et 14ème pour les réserves. L'article examine si et comment la BRI et le capital chinois ont contribué à la transformation structurelle ouzbèke dans l'industrie du gaz. Il soutient que bien que la BRI chinoise semble adopter une approche extractive pour acquérir des ressources naturelles, ses interventions sont également une opportunité pour des formes de modernisation multidirectionnelles dans le secteur du gaz,

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directement et indirectement. Directement, d'abord l'implication chinoise en tant que consommateur a reconfiguré les relations de pouvoir géo-économiques autour du gaz. Deuxièmement, il y a un soutien sans précédent de la Chine au développement de l'infrastructure nationale, à la fois en tant que prêteur et producteur. Troisièmement, la Chine est la principale source de machines pour développer la transmission d'énergie. Malgré ces facteurs, la BRI et la présence chinoise ne contribuent que marginalement à la modernisation. Une stratégie industrielle coordonnée venant de l'État ouzbek reste une condition nécessaire pour la transformation structurelle.

Resumen

¿Transformación estructural a través de una gobernanza geo-económica multi-vectorial? BRI y mejora de la industria del gas en Uzbekistán El gas es una fuente estratégica de energía y Uzbekistán ocupa el 11° lugar en el mundo en minería y el 14° en reservas. El artículo investiga si y cómo el BRI y el capital chinos han contribuido a la transformación estructural de Uzbekistán en la industria del gas. Argumenta que aunque el BRI chino parece adoptar un enfoque extractivo para adquirir recursos naturales, sus intervenciones también son una oportunidad para formas multidireccionales de mejora en el sector del gas, tanto directa como indirectamente. Directamente, primero la participación china como consumidora ha reconfigurado las relaciones de poder geo-económicas en torno al gas. En segundo lugar, hay un apoyo sin precedentes de China al desarrollo de la infraestructura nacional, tanto como prestamista como productor. En tercer lugar, China es la principal fuente de maquinaria para desarrollar la transmisión de energía. A pesar de estos factores, el BRI y la presencia china están contribuyendo solo marginalmente a la mejora. Una estrategia industrial coordinada proveniente del estado ouzbeko sigue siendo una condición necesaria para la transformación estructural.

Introduction

The 'Silk Road Economic Belt' (SREB)—part of China's Belt and Road Initiative (BRI)—was launched in 2013 promising to revive the physical and political connectivity epitomised by the Silk Road. However, its impact on structural transformation is still poorly understood and under investigated. Over the last years China and Uzbekistan strengthened their economic cooperation by signing hundreds of agreements worth several USD billion on infrastructure, energy and manufacturing. Uzbekistan is located on the original Silk Road and is one of the main beneficiaries of the BRI in Central Asia being included as one of the countries of the Silk Road Economic Belt. China has in recent years become its primary trade partner for both imports and export. Uzbekistan is Central Asia's most populous country; it has recently adopted an outward-looking strategy after 25 years of protectionism and state control of the economy (Lombardozi 2021, 2023) which offers a window for economic integration with major global investors. It is also landlocked, so Chinese-built road and rail links to ports could be particularly transformative. However, there are also concerns that the BRI is simply part of the China's 'going



out' strategy, driven by the need to acquire natural resources, and that it poses also a risk of 'debt-trap' diplomacy (Bandiera and Tsiropoulos 2020). Given the contested debate and the lack of empirical evidence to assess these claims, this paper contributes to expanding the understanding of how BRI-related investments operate, and the extent to which they are transformative for the Uzbek economy. It will do so by contextualising the BRI within the existing geo-economic matrix in which Chinese capital operates through the various processes of value chain upgrading in the gas-energy sector. Combining the literature on upgrading and the developmental state (Barrientos et al. 2011; Chang 2010; Chang and Andreoni 2020; Horner 2017) with insights from the critical geography literature (Mohan and Tan Mullins 2019; Mohan 2021), this article investigates whether and how the BRI contributes to advancing structural transformation through multiple forms of upgrading in the Uzbek gas industry. In this context structural transformation is understood as the result of incremental improvements in products, processes of production, and institutions triggered at the meso-level (Tregenna 2012; Chang and Andreoni 2020). Here I use the term *upgrading* to describe a shift to higher value-added productive activities, resulting from improved access to an ensemble of factors, including the organisation production processes, creation of a new product, knowledge, and skills (Barrientos et al. 2011; Lombardozi 2021; see also the introduction to this special issue). In fact, there is a limited literature that looks at the BRI from a GVC standpoint, examining whether and how the BRI is enabling dynamics of upgrading. The paper thus expands the existing literature on value chain upgrading as a heterodox economic framework for analysing the impact of the BRI. Why gas? Gas is the second largest export commodity of Uzbekistan. It has been identified by the government as a key strategic sector and is the main recipient of both domestic and foreign investment. The energy sector is therefore key to driving structural transformation. This can work in several directions: first, as an internal source of inputs for manufacturing production and household consumption; second, to stimulate infrastructure development; third, to generate export earnings; fourth, as a source of skills upgrading and linkages with other capital-intensive technologies and sectors.

The article argues that China's role in the development of the sector is not yet dominant compared to other competitors such as Russia. However, Chinese loans, purchase agreements and investments are potentially contributing to the upgrading(s) potentials in the gas sector in several ways. First, they provide tangible support for infrastructure development. Although this support is not always explicitly branded as part of the BRI, it is consistent with the BRI's objectives of connectivity. Second, by becoming a major player as both a buyer and an investor in gas, the BRI is helping to reshape the geo-economic matrix of trade and investment in the country vis-à-vis historical hegemonic powers such as Russia. Third, the intensification of gas trade with China has further exposed the country to the risk of energy security, which has incentivised both public and private investment in renewable energy. It is therefore argued that the BRI must be considered not only for its *direct* impact through Chinese loans and investments, but also *indirectly* through the reconfiguration of power and economic dynamics affecting energy GVCs. However, similar to other foreign actors, China's BRI enables only marginal forms of product, process and skill upgrading to support structural transformation. Finally, the paper



reflects on the nature of the financial and production flows that the BRI is unleashing, and whether the BRI is advancing a new model of global development. The next section will review the link between structural transformation, the energy sector and the BRI. Section "[Institutional liberalization and organizational upgrading of the gas industry](#)" will discuss the ongoing institutional reforms in the sector and outline the methodology and data sources. Sections "[Chinese's BRI and the changing geo-economic matrix in the gas industry](#)" and "[Upgrading and diversification in the gas industry: the Chinese effect?](#)" will analyse the findings and section "[Conclusions](#)" will conclude.

Structural transformation, GAS sector upgrading and the BRI

Gas is a strategic source of energy globally, and Uzbekistan ranks 11th in the world in terms of production and 14th in terms of reserves (IEA 2021). Energy is key to supporting structural transformation in low- and middle-income countries. However, the gas sector can also be the object of structural transformation itself. The gas sector can be the protagonist of various forms of product, process or functional upgrading that improve the structure of the economy. For example, gas can be processed into other forms of energy or products. New and more sophisticated skills, organisations and production processes can also be created to shape structural change. Its sectoral specificity therefore entails a particular way of triggering different forms of structural change that operate in several directions. First, it provides incentives for infrastructure development. Energy infrastructure extends beyond the territory of a state through material and social networks, supply chains and transmission lines (Mohan and Tan Mullins 2019; Mohan and Lampert, 2013). In addition, the host country needs to absorb foreign investment through new financial channels and new partnerships. In the case of the BRI, understanding the reconfiguration of the recipient country's institutional upgrading is a crucial step in assessing whether Chinese capital will enable developmental spillovers at the domestic level.

Looking at oil-exporting countries, Cherif and Hasanov argue that 'standard [Western International Financial Institutions (hereafter IFIs)] policy advice—i.e. implementing structural reforms, improving institutions and the business environment, building infrastructure and reducing regulations—may be necessary, but will not be sufficient [to implement structural transformation] due to fundamental market failures stemming from 'Dutch disease'' (2014, pp. 4–5). Instead, governments need to invest beyond the comparative advantages of economies. By targeting high value-added industries that can create spillover effects and productivity gains through state-led venture capitalism and private investments, policymakers can upgrade strategic industries. The role of the state is therefore important in shaping the direction and outcome of foreign investment in the energy sector to achieve virtuous structural transformation.

Secondly, development in the gas sector can lead to upgrading in skills and technologies in connected capital-intensive sectors. Energy sector upgrading can for instance create potential spillovers effects through internal transfers to manufacturing production. Indeed, one of the drivers of structural transformation is the



diversification of production and the creation of backward and forward linkages across and within sectors (Hirschman and Sirkin 1958). Resource-rich countries hold great potential to improve national industrial capacity by strengthening backward linkages through such resources (Morris et al. 2012; Tregenna 2012). That can occur through price distortions in the local downstream market or through public policy incentives such as subsidies and favourable regulations for the companies engaging in the sector. In this sense, the state occupies a privileged position to enable product and/or process upgrading through organisational upgrading (Lombardozi 2021), but also by coordinating separate but potentially inter-dependent production agglomerates across industries and sectors. That also creates demand for new skills and know-how, by creating the necessity of new professional profiles. An interesting example analysed in the literature is the plastic sector spin-off from petrochemicals in South Africa (Bell et al. 2021). These authors argued for the need to manage price pressures upstream and set clear industrial policy objectives. However, a regional market and strategic integration in GVCs play an important role in the success of upgrading. In the case of Azerbaijan Sadik-Zada et al. (2021) show that the Azeri oil industry was unable to convert resources coming from the energy sector into manufacturing or through product diversification. In the case of China, national energy security has compelled authorities to upgrade the structure of energy production towards renewables (including solar, hydro, wind, and nuclear power) and become the biggest investor in the world since 2013 (Ji and Zhang 2019). In this sense, the energy sector holds potential for both backward and forward linkages.

Thirdly, by upgrading gas infrastructure through product (pipelines) and process (by processing petrochemicals, refineries and Gas to Liquid (GTL)) trade will intensify. This implies an increase in revenue from exports—including to and from China—which can serve as leverage for establishing new geo-economic relations or simply to deepen and expand intra and inter-sectorial business relations locally. Indeed, Oh (2018) argues that infrastructure and energy projects create benefits tied to the physical geography of the investment and therefore can improve the bargaining power of the local beneficiaries. Therefore, the emergence of new geo-economic vectors involved in the value chain can contribute to reduce context-specific barriers with positive implications for structural transformation. However, despite the fact that such multivector dynamics have been widely studied in the international relations literature on Central Asia (Dzhuraev 2019), their material implications for structural transformation have been under-investigated, which is another contribution of this paper. In Central Asia, Russia, the EU, India, Iran and Turkey represent alternative sources of capital investment (Kohli 2017). Although Russia is still a major economic player and political power in Uzbekistan, the paper will show that the weight of the players in the game is changing. In this context, the BRI could also pave the way for a new pan-Asian economic orbit away from the Western IFIs.

However, the market expansion in the gas sector poses new challenges in terms of both internal and external circuits of energy provision. While liberalisation can stimulate domestic productive and organisational capabilities, its socio-economic impact on the population could be uneven. For example, international trade integration and price liberalisation could expose household consumers to price increases with the risk of energy poverty and increased inequality. In addition, international



price volatility and shocks need to be absorbed, so foreign-funded sector upgrading through foreign capital may not be sufficient to ensure national energy security and economic resilience. In this sense, a coordinated industrial strategy for national energy security requires investment in product diversification including renewables, where China is a key business player.

As with many other commodities, China's growing domestic consumption of natural resources and energy has made it one of the world's largest importers of oil and gas. As a result, the impact of its overseas investment on resource-exporting countries, as exemplified by the BRI, have become the focus of a rich scholarship. Some of the literature highlighted the Chinese's goal of the 'going out' strategy behind the BRI, which is based on outward investment and international trade (Jones and Zeng 2019; Mohan and Tan Mullins 2019). Authors have also noted that the Chinese mode of investment and international cooperation distances itself from Western models based on blind privatisation and market liberalisation (Weber 2021). In fact, both China and Uzbekistan rejected the recommendations of the IFIs until recently. They implemented distortions and capital controls and targeted FDIs in strategic industries or through government-controlled loans issued by state-owned banks such as Exim Bank and China Development Bank (CDB) (Mohan and Tan Mullins 2019; Rudyak and Chen 2021). However, it has been observed that these loans often end up in the hands of Chinese state-owned enterprises (SOEs) or private companies, and therefore never leave the Chinese supply chain (ibid Hurley et al. 2018). Therefore, while many have criticised the Chinese model for leaving recipient countries with little room for manoeuvre and trapping them in debt, others have highlighted that these investments have also often minimised the risk of corruption and accelerated the implementation of the projects (Mohan and Tan Mullins 2019) in sectors that the host country could identify as strategic. Using the case of Uzbekistan, this article examines whether China's role in the energy sector as a buyer, lender and producer (Horner 2017) can potentially create opportunities to shape a new geo-economic scenario conducive to structural transformation. It will also assess empirically whether the BRI is a predatory initiative with limited benefits for the local economy. The next sections examine the institutional context through which multiple forms of upgrading take place in Uzbekistan. The analysis of organisational upgrading (Lombardo 2021), product and geo-economic relations will inform the question of *if and how the Chinese presence is contributing to trigger upgrading in the gas industry and thus shape structural transformation*. Primary data was collected through 25 interviews with key stakeholders based in Uzbekistan. Given the travel restrictions associated with COVID-19, these interviews were largely conducted online with the support of a research assistant based in Tashkent between January and October 2022. Interviewees were purposively selected based on their expertise in the sector and through a snowballing process. They include academics based in Uzbek universities, policy advisers from international financial institutions such as the World Bank and the Asian Development Bank working in and on Uzbekistan, international consultants, members of the business sector based in Uzbekistan (local, Chinese and Russian) and members of the ministries including those in the Ministry of Finance. Anonymity was maintained to ensure confidentiality. In some cases, interviewees who were closely involved with Chinese companies declined to



be interviewed. Instead, experts working for the government and for IFIs were more open to sharing their experiences and views. Secondary data sources include official national statistics, international organisations and IEA publications, private companies' official reports and databases of multilateral financial institutions.

Institutional liberalization and organizational upgrading of the gas industry

Uzbekistan is one of the largest producers of natural gas in the world and the second in Central Asia, producing an average of 53 billion cubic metres (BCM)/year since 2010 (Pirani 2019, p. 14). It consumes more than two thirds of the domestic production, around 40 BCM/year. In 2020, the energy sector contributed to 5.7% of the country's GDP, more than 9% of state budget revenues, 4.4% of export earnings, and employed almost 180 thousand people (ITA 2022). The government has invested in various industries including agro-processing, textiles, chemicals, and automotive. However, according to the OECD, between 2000 and 2018 Uzbekistan spent more than USD 35 billion on infrastructure projects in the energy sector. This figure confirms the significant economic potential of the sector, which the Uzbek government recognises as highly strategic.

Technical reports, policymakers and expert interviews confirm that the Uzbekistan's energy sector suffers from ageing infrastructure, low efficiency, low investment in exploration and prospecting, but also processing. To date, waste and inefficiency have been recorded across all the energy sector including thermal power and electricity (distribution). The literature has partly explained this obsolescence and poor governance by the delay in unbundling and de-monopolising the sector in order to improve competition (Zachmann et al. 2020). Institutional reforms to modernise the sector are thus presented as key by both the official government statements (IEA 2021) and by IFIs (IMF 2021). To address these challenges, a number of organisational upgrades are taking place, which have triggered a reconfiguration of the market structure and actors involved. Institutional restructuring of key public players is occurring through new roles, policy objectives and terms of responsibilities. The Ministry of Energy is the key actor in energy policy which since 2019 has concentrated strategic energy tasks from the Ministry of the Economy and Finance and the state agencies *Uzbekenergo* & *Uzbekneftegaz*. Uzbekistan's SOE *Uzbekneftegaz*, the national holding company of the gas and oil sector, still owns the two major refineries and produces most of the gas in the country at 34.1 BCM (64.3%). In 2019, production totalled to 60.4 BCM (IEA 2021). However, in July 2020 the president has issued a decree to split *Uzbekneftegaz* into three bodies dealing with transmission, distribution and generation. The decree requires (i) the separation from *Uzbekneftegaz* of *Uztransgaz*, which will deal with transmission, i.e. purchasing gas from upstream producers, transporting it in high-pressure pipelines and supplying it to customers; (ii) the creation of *Khududgaztaminot*, which will manage domestic sales and distribution networks and supply residential and public-sector customers; and (iii) the corporate reorganisation of upstream assets, and the abolition of unnecessary administrative subdivisions. The decree also requires *Uzbekneftegaz*, which



is directly involved in production, to increase production in order to improve energy efficiency and develop renewable energy (Pirani 2019, p. 24).

In line with this market-oriented organizational upgrading, the sector is also being liberalised to marketise prices and allow for capital inflows and foreign investment. In August 2021, a wholesale market for electricity and natural gas has been created for producers and importers and, as a first step, large companies have been allowed to import electricity and natural gas. Each power plant will negotiate tariffs individually with the single buyer National Electricity Networks and sign Power Purchase Agreements (PPAs).

The Ministry of Finance remains responsible for tariff policy and is working to align prices with market-based prices and to introduce market mechanisms in the phases of production, transmission and supply of natural gas. An interviewee employed in an international consulting firm specialising in private sector development confirmed that tariff prices have been historically very low, but that prices have been held back due to the uncertainty of the future scenario of energy supply as a result of external shocks such as the war in Ukraine and COVID-19. The wholesale and retail markets are expected to become operational sometime in 2024, allowing private companies to sign power purchase agreements on a long-term private–public partnership basis. Such agreements are already being signed with companies that are interested in investing in Uzbekistan’s energy sector. In the summer of 2019, the Uzbek authorities liberalised the price of AI-91 petrol. Fuel prices were expected to skyrocket. *Uzbekneftegaz*’s deputy head, Ulugbek Ashurov, told the press that, given the recent collapse in global oil prices, the cost of AI-80 and diesel would fall after liberalisation. However, energy experts interviewed noted inconsistencies in the industrial strategies of interlinked sectors, particularly between gas and oil. For example, there was a mismatch in the price of oil, which was much higher than gas, and that was still regulated. This led to disruption for consumers who used oil as a substitute when gas was unavailable due to winter shortages. The reduction in tariffs, the uncoordinated liberalisation of gas distribution and the scattered pro-market policies could lead to a risk of dependency on the export of raw materials (Pirani 2019) and a missed opportunity to trigger patterns of coordinated upgrading in the sector.

This market-oriented restructuring of the downstream segments of the sector is part of a wave of reforms launched in 2016 by the new president Mirziyoyev which aims to demonopolise, deregulate and attract private investors across the economy (Pomfret 2019), in line with a more neoliberal development agenda. Indeed, the government is following the recommendations of Western IFIs to improve transparency and corruption and to align with the principles of corporate governance and price liberalization (IMF 2021). IFIs have played a role in shaping tax codes, corporate governance and competition laws, in order to upgrade the regulatory architecture in which gas production and trading operate. The appointment of the former EBRD head Suma Chakrabarti as adviser to the president is a clear sign of their willingness to remove ‘market distortions’, one interviewee acknowledges.

The commercialisation of *Uzbekneftegaz* is not directly linked to the BRI framework, which does not state any preference or direction for privatization. However,



Table 1 Uzbek gas balance and exports (2010–2018)

Bcm	2010	2011	2012	2013	2014	2015	2016	2017	2018
Production (sales gas)	59.2	56.6	56.5	55.9	56.3	53.6	53.1	53.92	57.34
Total gas balance	59.2	56.6	56.5	55.9	56.3	53.6	53.1	53.92	57.34
Domestic consumption	45.1	46.0	44.8	43.8	46.5	45.7	42.6	43.2	44.1
Export (total)	14.1	10.6	11.8	12.2	9.8	8.0	10.5	10.8	13.3
To/through Russia	11.4	8	8.7	5.6	3.6	3.5	4.3	5.5	3.8
To Kazakhstan	2.5	2.4	2.7	3.7	3.7	2.9	1.9	1.7	2.9
To Kazakhstan and Tajikistan	0.2	0.2	0.2	0	0.04	0.02	0.02	0.02	0.02
To China	0	0	0.2	2.9	2.4	1.5	4.3	3.5	6.5

Source Dadabaev et al. (2021)

an important implication to highlight is that such neoliberal reforms have facilitated Chinese and non-Chinese lending, investment and overall capital inflow into the sector, especially hydrocarbons (Bebbington et al. 2013). Indeed, the reform of the energy sector has led to an increase in lending to finance capital goods, equipment purchases and infrastructure in the sector. This is because these institutional reforms have coincided with a parallel reform of the financial sector which led to the establishment of foreign commercial banks in the country which issue private loans and manage private deposits. However, according to official figures, the five largest banks, National Bank of Uzbekistan, Asaka Bank, Sanoat Qurilish Bank, Ipoteka Bank and Agrobank together hold more than 67% of the national banking assets and continue to centralise the core of the government's industrial-productive financing. They also have partnerships with foreign banks, including Chinese banks. For example, Asaka Bank and the Industrial and Commercial Bank of China (ICBC) signed a framework agreement on financial cooperation to attract ICBC borrowed funds, insured by the PRC ECA Sinosure, to finance SME projects with a maturity of up to 8 years, providing for the supply of technological equipment and services and attracting investment from China. Therefore, the Uzbek state seems to hold a major role in shaping the financial support to the industrial sector, including that provided through BRI-related capital.

As further evidence of the Uzbek government's need for capital to enable productive investment through an intensification of financial credit, the Chinese delegation of the Silk Road Fund visited Uzbekistan in 2018 and signed a loan agreement with *Uzbekneftegaz* JSC worth over USD 600 million to implement joint projects in the oil and gas sector, which will be discussed in the next section. This has had an obvious impact on the capital account deficit. In the most recent balance of payments, official figures show that external debt is higher mainly due to external borrowing from IFIs, especially the Asian Development Bank and EBRD and the Chinese Development Bank, and it has doubled between 2016 and 2019 (WB data). However, unlike Kyrgyzstan and Tajikistan, China is not Uzbekistan's main lender and



its hidden and sovereign debt exposure to China as proportion of GDP is classified as low by AidData, which seems to disprove the argument that the BRI is conducive to a debt trap, at least in the case of Uzbekistan. Interviews with former international policy officers underlined the Uzbek government's ability to diversify the sources of credit. Thus, the entry of Chinese and other foreign financial players as a result of the liberalisation of the sector has arguably contributed to the organisational upgrading of various state and non-state institutions, while minimising the risk of exposing the economy to a single lender. This liberalisation is at the risk of higher prices and possible supply disruptions, it has also contributed to create incentives to upgrade the operational and productive capacity of the gas industry.

Chinese's BRI and the changing geo-economic matrix in the gas industry

The previous section discussed the link between the liberalisation of the gas sector, its organisational upgrading and the role of Chinese capital. This section examines the geo-economic competition behind Uzbekistan's gas value chain and whether and how this is triggering dynamics of upgrading. Although in 2021 the government of Uzbekistan announced that it would stop exporting of natural gas by 2025 in order to focus on creating added value through processing, the production of natural gas has declined while export commitments have increased until 2022. The Government of Uzbekistan has increased its export commitments by 15% compared to 2018, with 8 BCM committed to China and 4.5 BCM to Russia in 2019 (Table 1). One interviewee stressed that by 2021, gas exports to China will account for 7–8% of the total national production. Thus, in recent years China has become the largest buyer of Uzbek gas outside its borders.¹

As noted above, the Uzbek government closely scrutinises all foreign investment, with a particular focus on sectors it considers strategic, such as mining, cotton processing, transportation and oil and gas refining. However, Uzbekistan's energy and transportation sectors have been identified as the most attractive sectors for foreign investors (Dadabaev et al. 2021). While reserves exploited by the state-owned *Uzbekneftegaz* account for half of national production, the rest is managed by international joint ventures under production sharing agreements (PSAs). Russia's Lukoil is the largest in the country producing 13.8 BCM (25.7%), and the South Korean joint venture Uz-Kor Gas Chemical supplies 2.1 BCM of gas (3.9%). International investors are increasingly present not only in production but also in the phase of exploration and development. Interviews confirmed that the usual small fields in Uzbekistan, located between Bukhara and Khiva are indeed in decline. So new expansions and explorations are needed, as well as the capital to make it happen. Indeed, the rising domestic demand combined with the past export commitments has put great pressure on dwindling gas resources.

¹ The turbulence in Kazakhstan in 2021 and the domestic supply shortages during the 2022–2023 winter have incentivised the Government of Uzbekistan to prioritize domestic needs.



Although there are many foreign investors, each of them holds distinctive stakes and power in the Uzbek gas industry. Korean, Azeri and Malaysian companies and others are present in the sector, but the two main players are Russia and China. Although Russia has traditionally been the main importer, in 2018 China became the first importer, doubling the amount of gas it acquired from Uzbekistan. Both countries are not only buyers, but also major lenders and investors in the country, as evidenced by several BRI-related projects. Therefore, it is important to assess the implications of the BRI and Russia's presence, in terms of productive investment in the sector.

Russia

Interviews and authors (Dadabaev et al. 2020) argue that Russia has a neo-colonial approach to the energy sector in Uzbekistan that is difficult to challenge. Historically Russia has been a dominant presence in the gas infrastructure, retaining a monopoly on infrastructure and trade before China created an alternative network (Dadabaev et al. 2020).

Although the COVID-19 pandemic has reduced the demand for hydrocarbons, Lukoil's production has increased by 2020 and domestic demand for natural gas increasingly competes with export commitments. The main objective of the Russian company has been to increase exports to China (Pirani 2019), which are likely to have increased further since the war in Ukraine. Lukoil is a major player in the market in terms of (upstream) production. In 2018 Lukoil produced 13.4 BCM of the national total of 57.4 BCM. Lukoil's production has increased in recent years while *Uzbekneftegaz's* has decreased (Pirani 2019).

In terms of resource exploration and know-how, both the literature and interviews with stakeholders involved in the sector confirm that Russia has an undisputed hegemony over Uzbek gas exploration. It has very precise geo-location intelligence that is not available to other investors. As one energy expert interviewee put it: "Lukoil invested in the Kandym Plant, which is the most promising mine extraction site among those available". Indeed, much of the Uzbek infrastructure was inherited from the Soviet Union and therefore, such a partnership has a natural continuity with the past.

Lukoil is investing in the Republic of Uzbekistan under a production sharing agreement (PSA). A major project is Kandym-Khauzak-Shady and Gissar. The company's strategic partner in these projects is the national holding company *Uzbekneftegaz* (Lukoil website). After putting pressure on Karimov's government, Lukoil managed to get permission to invest and operate alone with a 50-50 PSA split with the government, deducting the costs. The predatory agreement left the Uzbek government with a significant debt due to the disruption of gas supplies from other fields. As one Uzbek interviewee noted: "When the extraction from other local mines was shrinking, it was necessary to obtain our share from Lukoil. However, Lukoil gave us an invoice with an export price. So, while we were supplying gas to our domestic consumers for about USD 35 per 1000 cubic meters, the government had to subsidise it by buying this gas from the Russian company for USD 50 and



then supplying it to consumers at a price four times lower. This gas was extracted from our fields!”). Uzbekistan had to buy gas from the domestic LukOil Kandym plant at export prices because of the PSA, resulting in a debt (arrears) USD 1 billion in 2018 (Zachmann et al. 2020). Another interviewee noted that Russian energy companies use very unfair clauses to charge the Uzbek side with unjustified inflated costs related to Russian workers paid in Uzbek plants and offices, who are paid five times more than Uzbek employees.

Russia has clearly used its political past and leveraged on its cultural legacy to maintain its commercial supremacy and remain a major investor in the country. However, the infrastructure of the sites is less modern than those in which the Chinese are investing, and has not allowed the sector to modernise over the years. Moreover, according to interviews with academics and consultants who are experts in the sector, Russia is not seen as a reliable business partner, because it tends to renege on the price agreed in long-term agreements. A famous dispute between Gazprom and the Turkmen government was due to the renegotiation of a gas price agreement which the Russians demanded after the drop in gas prices in 2014.² All these empirical elements confirm the economic power that Russia holds in the region.

China-BRI

Uzbekistan has become an important destination for Chinese and BRI-related capital in natural gas, uranium and transport links. Since 2015 China has been Uzbekistan’s largest source of foreign investment in infrastructure and China has been establishing companies at a rate that has overtaken Russia (Dadabaev et al. 2021). In 2019, China’s top three import categories from Uzbekistan were natural gas (47.9% of all exports from Uzbekistan to China), textiles (20.9%), and raw cotton (7.4%).

The main Chinese-BRI energy players in the region are the CNPC, China National Offshore Oil Corporation (CNOOC), and China Petroleum and Chemical Corporation (SINOPEC), all of which have partnered with local companies to compete with traditional power players such as Russia (Zhihai 2021). China National Petroleum Corporation (CNPC) is the world’s third largest oil company based in China and plays a leading role in China’s oil industry.³ China National Oil Development Corporation (CNODC, a subsidiary of CNPC) signed an agreement with Uzbekneftegaz under which CNPC Silk Road Group undertook exploration in five investment blocks in Ustyurt, Bukhara-Khiva and Fergana regions. As a result, three gas condensate fields (Dengizkul, Khojadavlat and Sharky Alat) were discovered in the Karakul block in Bukhara. The project was financed by a USD 177.7 million loan agreement with the Bank of China, guaranteed by CNPC. The total cost of the project was USD 377.5 million.

In 2017, after negotiations between President Mirziyoyev’s administration and CNPC, CNPC-*Uzbekneftegaz* joint venture started exploration projects at both

² <https://www.rferl.org/a/russia-gazprom-turkmenistan/29883131.html>.

³ https://www.cnpc.com.cn/en/CentralAsia/CentralAsia_index.shtml.



Table 2 Chinese/BRI projects in the Uzbek gas industry

Commitment year	Project	Lending agents	Interests' rate	Grace period	Repayment /maturity period
2013	529-km gas pipeline called Central Asia China pipeline	Transfer/donation	—	—	—
2012	Tashkent power plant \$220 million	CDB	0.687% in 2012 + 3.6%	3	15 years
2013	Angren thermal power plant 165 million USD	Eximbank	2%	5	20 years
2012	Transmission lines linking thermal power plants	Eximbank	2%	5	20 years
2017	Shurtan petrochemical complex 3.7 billion USD	Consortium—CDB 1/3 of the total (2.5)			16 years
2017	New Silk Road Oil and Gas \$178 million Exploration at five investment blocks in Ustyurt, Bukhara-Khiiva and Fergana regions	Bank of China under the guarantee of CNPC			
2009	Mubarek gas processing plant \$85 million	CDB	6.2	2	9 years
2012	Uz-Kor Gas Chemical LLC \$250 million USD	CDB		16	

Source Author's elaboration based on AidData



Dengizkul and Ming Bulok oil field in the Fergana basin (Pirani 2019, p. 27; Aid-Data). However, the investments were unsuccessful, and the Chinese faced a major loss. The Chinese exploration has been a failure, a gas expert noted: “Chinese Sinopec went down 6000 m. It’s very expensive to pump it out from such a distance. That was a kind of failed project that was not a very successful investment for the Chinese”.

According to official government statistics and World Bank data reported by the US embassy⁴ in 2021, in 2019 China had accounted for more than 40 per cent of foreign direct investments in fixed assets across the Uzbek economy (worth around 4.5 billion USD). Russia was a distant fifth with 5.1% after the Netherlands, Korea and Turkey. In 2020, almost 1800 Chinese companies were involved in trade, construction, oil and gas exploration, transport, infrastructure building, telecommunications, textiles, chemicals, and logistics and agriculture. According to Chinese reporting to the WTO, Chinese FDIs are mainly in the manufacturing and agro-processing sector, and less in the gas sector. Indeed, because of the risks associated with FDIs and the capital-intensive nature of the gas industry, China is now focusing more on loans, which are more tied to the recipient country (see Table 2).

China is the main supplier of both machinery and loans at very attractive interest rates (between 2 and 3.5%). As mentioned above, the Silk Road Fund is playing an important role in excavation projects. Excavation projects finance directly Chinese firms such as Sinopec but also Uzbek government via *Uzbekneftegaz*. Uzbekistan has a double-edged sword with the Chinese government as it is not only an importer of gas, but also a producer and a lender in the sector. Therefore, the conditions for upgrading and diversification attached to these loans will depend on both ends (Oh 2018). However, in contrast to Russia, and based on interviews, China has proven to be a reliable customer that pays on time and respects the terms of agreements.

Although the geopolitical presence of China and the BRI in the country is still small compared to Russia, the entry of China in the market can reduce Russia’s dominant position in the sector. Russian businesses remain the main investors especially in the exploration and distribution phases. However China, through the BRI framework, is becoming the main lender to upgrade infrastructure and in recent years has become the main buyer of Uzbek gas. According to the IEA, since the 2000s the most significant export destinations for energy commodities are China, Russia and Kazakhstan importing 8 BCM; 4.5 BCM; and 2.5 BCM respectively before the pandemic.⁵ Therefore, although this data might confirm that the Chinese going out strategy agenda aims at acquiring natural resources, it is also reconfiguring the demand for gas on the international market, which could contribute to a shift in the geo-economic matrix of the sector, and its potential for upgrading. The newly built Chinese pipelines are for instance up to state-of-the-art standards and are complexifying the circuit of production and consumption in the Eurasian region. However, the depletion of gas surpluses, and the growing internal and external demand pressures means

⁴ <https://www.state.gov/reports/2021-investment-climate-statements/uzbekistan>.

⁵ We can observe a decline in the year 2020–2022 which was due to the contraction of global trade and industrial production due to COVID-19.



that diversification (and thus upgrading) of the energy sector towards renewables and processing is necessary, which will be discussed in the next section.

Upgrading and diversification in the gas industry: the Chinese effect?

This section now looks at whether and how the Chinese-BRI presence has contributed to forms of upgrading of the Uzbek gas industry. As noted above, the political economy of the recipient country is crucial to understanding the conditions under which the BRI operates, and the outcomes that occur (Mohan and Lampert 2013). Hence, in the context of Uzbekistan, Chinese investment needs to be understood as embedded in a process of marketization and productive transformation peculiar to the country, especially since the establishment of the new Mirziyoyev's government. Data show that both the volume and value of trade have doubled since 2016, from USD 9 billion to USD 21 billion in 2019 (UN Comtrade 2019).

In this context, the BRI-related interventions are visible in heterogenous ways. Some interventions have affected upgrading *directly*, some have been affecting upgrading *indirectly*.

First, one of the Chinese-led interventions that directly affected upgrading in Uzbekistan was in infrastructure. Infrastructure projects in Uzbekistan accounted for more than USD 70 billion between 2000 and 2018, and 45% of which was in the oil and gas industry (Dababaev et al. 2021). The Chinese Development Bank has been a major contributor to this upgrading, for instance through the construction of the 529-km Central Asia-China gas pipeline, line C (CGEF 2022). This new pipeline started in Turkmenistan, has three stems and has been operational since 2009. One interviewee noted. "They started to build another stem but then it became clear that on the Chinese side there is no need for such a huge input from Central Asia and not a lot of gas is available in Central Asia to pump to China. The annual carrying capacity is 10–12 BCM for each stem and Turkmenistan, Uzbekistan, and Kyrgyzstan are stakeholders of the pipeline for each of their segments". CNPC has financed and built the entire infrastructure, but the host countries retain the ownership which could potentially have spillover effects.

Therefore, the Chinese projects, by modernising some of the obsolete infrastructures have directly contributed to the upgrading of the sector in the phase of processing and distribution. However, these infrastructures have also expanded the grid, which has removed Russia from a position of quasi-monopsony, thus offering to the Uzbek gas industry the opportunity to exploit new export destinations (Aminjonov et al. 2019) and potentially to achieve a stronger negotiating position with old commercial partners. However, it remains to be seen whether Uzbekistan will be able to use this new infrastructure and bargaining position to enable productive investment for structural transformation.

Furthermore, Uzbekenergo received a loan from China Development Bank worth USD 220 million to finance the modernization of the Tashkent Power plant at LIBOR interest rate (0.687% in 2012+3.6%). In 2003 a similar modernisation project was financed by Eximbank for the Angren Thermal Power Plant powered with gas. The loan of USD 165 million was for 20 years at an interest rate of



2% and was co-financed by Uzbekenergo for USD 71 million. The EPC contract was awarded to Harbin Electric, a Chinese company. Similar loans from Eximbank at low interest rates (2%) were also provided in the early 2000 to strengthen the transmission lines connecting thermal power plants, but also to install 400,000 gas meters.

Data therefore confirms that over the past years the modes of financing structural transformation in the gas sector have changed, with a decreasing share of aid in favour of public finance, namely through concessional and non-concessional loans executed by Exim Bank and CDB (Vazquez et al. 2021). Indeed, as Pairault (2018) argued in the case of Africa, in Uzbekistan the BRI presence in the gas sector is less visible through direct investment. China is primarily a lender and consequently a service provider, with the contractors hired to build Uzbek infrastructure primarily from China. “Payment for services is an expense (and simultaneously an investment) for the African country (the client) and a revenue for China” (2018, p. 19). Although these types of capital inflows do not involve a direct risk for the Chinese investors and arguably provide a market for Chinese companies, they are often serving the need of the host country, and align with national industrial objectives.

Secondly, not only because of Chinese investment, but the reconfiguration of the industry and the introduction of new players has *indirectly* increased the demand for local professionals in the gas industry and has risen their wages. That’s because new projects have created more demand for engineers and scientists by ending the position of monopsony of UzbekNeftGas, which was the main employer of these energy experts. Hence, the diversification in the sector occurred through the presence of new foreign players in the market have created an incentive to move to private companies, where they are much better remunerated. A former academic and economic expert on Uzbekistan confirmed that in 2010 there was a transformation of the job market in the oil and gas sector. Uzbek engineers left the company UzbekNeftGas and set up Enter engineering, a private limited liability company. Enter engineering specialists could negotiate their salaries, set their own tariffs in the market. “Enter Engineering and Eriell Group are among the top five companies in terms of turnover”, he added.

Enter Engineering and Eriell Group are two private companies created in Uzbekistan in response to the marketisation of the energy sector. Although the gas industry is not labour-intensive and may not be able to create many unskilled and semi-skilled jobs, the employment prospects for Uzbek nationals in the sector are nonetheless improving as new companies invest. Indirectly, the BRI-related investment, by creating new market opportunities, has contributed to this. Interviews also confirmed that Chinese companies also hire local translators and logistics operators contributing to employment in the service sectors associated with gas projects.

Thirdly, the fragile dynamics of the gas trade have *indirectly* fostered a process of technological innovation both vertically and horizontally. Domestic supply has been strongly influenced by international demand. This was already the case before China became the main buyer however, the BRI has contributed to increasing this vulnerability. For instance, during the first wave of the COVID-19 pandemic the demand for gas from China fell, exposing Uzbekistan and other Central Asian countries to revenue losses. On the one hand, these export reductions helped to meet the



demand of local household consumers who were regularly cut off from gas in winter due to the more profitable export price. On the other hand, it has been a further signal of the need to upgrade the sector away from export of unprocessed commodity. The intensification and volatility associated with the Chinese commercial relationship have incentivised the government of Uzbekistan to upgrade the gas product by adding value and diversifying the source of energy towards renewables. Valid alternatives have been identified in the solar, hydropower and biomass (Eshchanov 2011). However, these investments require a coordinated national industrial policy which could create cross-sectorial incentives through price distortions across sources of energy, profitable jobs, and long-term infrastructure development. Such circumstances suggest once again that the BRI represents a potential developmental tool that can be used by countries to trigger processes of upgrading and structural transformation. However, the BRI does not unilaterally define their development path, which depends on the strategic industrial capacity of the state.

Nevertheless, Chinese capital is playing a key role in the product upgrading of the local industry. For example, in 2018 a consortium of banks provided a USD 2.3 billion syndicated loan to Uzbekistan GTL, a subsidiary of JSC ‘Uzbekneftegaz’ to develop and operate the first GTL plant at the Shurtan petrochemical complex in the Guzar district. According to AidData, the total cost of the plant is estimated at USD 3.7 billion. The Xinjiang Branch of China Development Bank (CDB) reportedly contributed USD 1.2 billion to this project in 2017. The remaining costs would be covered by other international financial institutions, including the Export–Import Bank of Korea, Korea Trade Insurance Corporation (K-SURE), Gazprombank, Russian export credit agency EXIAR, Credit Suisse, and Japanese banks MUFG, SMBC and Mizuho. Uzbekistan GTL LLC is the owner and operator of the project, while a South Korean consortium led by Hyundai Engineering & Construction company is serving as the general contractor. Uzbekneftegaz launched the GTL plant in the fourth quarter of 2021, and it will help reduce the country’s dependency on oil product imports⁶. The plant will allow the country to use its large natural gas reserves to process it into diesel and other sources of energy. The plant would refine 3.6 BCM of gas per year and produce about 307,000 tonnes of jet fuel, 724,000 tonnes of synthetic diesel, 437,000 tonnes of synthetic naphtha and 53,000 tonnes of LPG per year. One interviewee confirmed that this is part of the government’s logic to upgrade the gas sector. He added: “There is at least a fivefold difference in value between the simple methane that comes through the pipelines, and the liquefied propane. So, it is always more attractive to switch from methane to propane and sell it”. Such investments are therefore a step towards product and functional upgrading which will increase the value of the raw commodity and generate employment in the processing plants. To implement these projects, Uzbek SOEs have teamed up not only with Chinese investors but also with other international investors, including Azerbaijan’s SOCAR, Europe’s Rothschild & Co, and IFIs. This confirms the intention of the Uzbek government to rely on more than one creditor to upgrade the gas industry.

⁶ <https://www.reuters.com/business/energy/uzbekistan-launches-first-gas-to-liquids-plant-2021-12-25/>.



China's BRI has provided multiple loans to process gas. According to AidData, in 2017, they announced a USD 178 million loan to the New Silk Road Oil and Gas—an Uzbek-Chinese joint venture—for the implementation of the Gas Condensate Field Khojadavlat Project (also known as New Silk Road Project) which is obtained from processing natural gas. Previously, in 2009 the China Development Bank and the National Bank for Foreign Economic Affairs of the Republic of Uzbekistan signed a USD 85 million loan agreement for the construction of a propane-butane blending unit at the Mubarek Gas Processing Plant. The plant was expected to produce 492,000 tonnes of polyethylene, 66,000 tonnes of condensate gas and a few tonnes of pyrolyzed petroleum per year. The work was supervised by Uzbekneftegaz. This project was completed in May, 2013. The interest rate was 6.5%, slightly higher than recent loans with a fairly long 9-years grace period.

In 2012, a consortium of banks from China, Korea and ADB provided USD 2.5 billion in loans to Uz-Kor Gas Chemical LLC for the Ustyurt Gas Chemical Complex Project, an Uzbek-Korean joint venture. The complex consisted of a gas separation plant, units to produce 400,000 tonnes of high-density polyethylene, 100,000 tonnes of polypropylene, and 110,000 tonnes of pyrolysed gasoline per year. China Development Bank provided approximately 10% of the total debt contract for the project (around USD 250 million) with a maturity period of 16 years. Other lenders were mainly Korean banks, with a small proportion of European banks. The contractors were also Korean.

These loans have two distinctive features. Not all the contractors in the financed projects are Chinese companies, which means that there is no repatriation of funds coming back to China. This also means that in most of the projects China is neither a service provider, nor an investor, but only a lender, albeit at very favourable terms. Secondly, BRI financial institutions have started to invest in the country in cooperation with other governments, but mostly Asian ones, i.e. non-Bretton Woods institutions. Interviews with IFIs officials revealed that there is no official stance 'against' the BRI however, the EBRD and IMF projects are rarely co-financed with BRI funds. IFIs's risk assessment reports have described Chinese SOEs as having an "aggressive risk appetite" (EBRD n.d.). In particular, it is noticeable a close collaboration with Korean and Russian partners and to a lesser extent with some Western private creditors. In this sense, the BRI definitely contributes to changing the geo-economic matrix by diversifying, if not shifting, the financial circuits of the region towards the East. Thus, the BRI presence in Uzbekistan as in many other contexts should not be analysed in a vacuum but rather as part of a 'chessboard' of multiple actors, sometimes acting as competitors and sometimes as business partners. The gas industry, being highly capital-intensive, has provided an interesting lens through which to analyse the interactions between such international sources of capital and reflect on their developmental role.

Finally, another attempt of product upgrading led by the Uzbek government is through new types of energy sources, namely renewables. One interviewee noted that "in the last 20 years the production of oil has decreased, and gas production is not increasing, but in the last 20 years the Uzbek population has increased by 10 million (0.5 million per year)" requiring new sources of energy and employment. The adoption of a recent Presidential Resolution on this issue is a sign of the



national priority to strengthen the country's energy security, create the necessary conditions for expanding the possibilities of using renewable energy sources and the stable development of hydrogen energy, including strengthening the scientific potential in this area. For this purpose, the National Research Institute for Renewable Energy Sources was established under the Ministry of Energy (IEA).⁷ The main tasks of the Institute are the formation of priority areas for the use of renewable energy sources and the development of hydrogen energy, applied research, and the development of innovative projects in these areas.

In this context, as eurasianet.org reported in an article in 2020, "State capitalism in China offered to Kazakhstan [and to other Central Asian countries] a nudge" on renewables. According to news media and reports, the overcapacity of renewable technologies in China has led the government to push private companies to explore new markets, and Central Asia is becoming a destination (Zhou 2023). Due to a lack of domestic technical capacity, Uzbekistan needs foreign experts. However, in 2017 the Uzbek president has cancelled a deal of USD 100 million to build a solar power plant in the Samarkand region with the Chinese company China Shuifa Singyes. EBRD and France's Enron appear to be in an advantageous position for such a project. Nevertheless, the Uzbek Government and public banks have borrowed more than USD 226 million from the Export-Import Bank of the Republic of China (Chexim) to finance the development of four hydropower plants to generate electricity across the country (CGEF 2022). In addition, at the 2022 Shanghai Cooperation Organisation (SCO) summit in Samarkand five documents were signed by the leaders of China, India, Pakistan, Russia, and the five Central Asian countries, including a joint statement on energy security and one on climate change. Their vision was to coordinate the development of renewable energy while continuing to invest in the upgrading of gas and oil, which is a major departure from Western IFIs, which have stopped funding these sectors to comply with the Paris Agreement (Zhou 2023). Therefore, processes of upgrading are certainly beginning to take place across the energy sector. The government of Uzbekistan seems to be wary of engaging with BRI partners in an exclusive manner. In fact, the breadth of economic partnerships seen across the industry suggests that the Uzbek government is relying on the BRI, but is also pursuing a multi-vector strategy. By diversifying the sources of funding, it will minimise its economic and political vulnerability in relation to both the BRI and Russia.

Conclusions

Uzbekistan is a doubly landlocked country and suffers from poor infrastructure and technological innovation, which are major obstacles for upgrading its gas industry. In this context, China is Uzbekistan's emerging and most important commercial partner, and a major source of investment and loans. Gas has been a major Uzbek export

⁷ <https://www.iea.org/policies/11979-strategy-for-the-transition-to-a-green-economy-for-the-2019-2030-period-resolution-of-the-president-of-the-republic-of-uzbekistan-no-pp-4477?q=Uzbekistan&s=1>.



commodity to China (almost 50% of exports in 2019⁸) and also the main destination of Chinese BRI loans. In such an intertwined relationship, China has become a leading lender for much-needed large-scale energy projects. The narrative promoted by the IFIs is that foreign investors and the integration into the global market are crucial factors for upgrading the Uzbek gas industry, and that its underdeveloped conditions are due to the unclear competencies of government institutions and corruption (IMF 2021). The BRI can help diversify sources of capital and create virtuous linkages within and across the energy sector. However, given the expansion of state and non-state actors involved, the role of China (and the BRI) in the host country needs to be understood in relation to the presence of other actors. Thus, it is argued that the BRI needs to be assessed not only for its direct effects through Chinese's loans and investments, but also indirectly through the reconfiguration of power structures and relational economic dynamics that it enables. In particular, in Uzbekistan the BRI has to be analysed in relation to other regional players especially Russia, and within the Uzbek multi-vector strategy.

Furthermore, external conditions matter. Price volatility and global demand shocks during the pandemic have created the need to identify alternative destinations for the rich gas reserves of the country. The war in Ukraine has also contributed to changing the traditional volumes and prices of the regional trade matrix, which suggests that a focus on energy security is needed as never before. There are state-led attempts to upgrade both vertically (i.e. Gas to Liquid) and horizontally through new renewable sources of energy. Additionally, domestic use, as well as plastic and petrol transformation are considered to be two viable alternatives for the sector. However, empirical evidence suggests that these efforts are still tentative and there are some local concerns about insufficient local job creation, as well as the export of gas to China which has led to shortages in domestic supply. There are many cases where such investments were implemented by using BRI-related capital, as well as skills and equipment from China. This evidence would suggest that the BRI has a predatory nature which is not directly contributing to the structural transformation of the country. However, the tangible infrastructure remains and the BRI has been a crucial source of credit for infrastructure development, which can indirectly pave the way for structural transformation and is not yet identifiable as a debt trap. Therefore, the case of Uzbekistan suggests that it is up to the state capacity of the recipient country to leverage the opportunities that the BRI offers through a coordinated industrial strategy that can enable technological upgrading, create employment opportunities and ensure structural transformation in the long term. The energy sector needs a coherent state-led industrial strategy which channels foreign investment and loans strategically to ensure a process of structural transformation that would not put the country at risk of supply disruptions and expose consumers and other productive industries to prices and supply volatility. Another aspect to consider is the social impact of the marketization reforms in the gas industry and the involvement of the BRI and China in these processes. The international market has traditionally competed with Uzbekistan's domestic demand for gas. However, the recent market

⁸ <https://oec.world/en/profile/bilateral-country/chn/partner/uzb>.



liberalisation also risks exacerbating inequality among gas consumers, highlighting the uneven impact that the BRI infrastructure investment might help to perpetuate. Therefore, a national industrial policy is also needed to combine economic and social objectives.

In conclusion, there are potential limitations in analysing structural transformation by looking at only one industry. However, looking at the multiple dimensions of gas upgrading has shed light on the delicate meso institutional dynamics and geo-economic factors involved in such a complex process.

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Declarations

Conflict of interest I declare that I have neither financial nor personal interests that could have inappropriately influenced the study. This work is original, and it has not been published elsewhere.

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