



Issues Paper

Future Calling: Infrastructure Development in Central Asia

Unlocking Growth in the Heart of Eurasia

by
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Foreword

Development debates often focus on natural curses and blessings. For some countries, being landlocked is a curse resulting in difficult and costly access to/from markets. However, for the countries comprising Central Asia, most notably Kazakhstan and Uzbekistan, in ancient times and today, being landlocked has been a blessing. The Silk Road puts Central Asia in the crossroads of the East-West and North-South trade routes.

Infrastructure is the key to exploiting this location and transforming it into economic development and prosperity for the people of the region. Much of the attention focuses on the hard infrastructure: pipelines, railways, highways, and communications networks. Going back to ancient times, such infrastructure allowed markets to function and grow by connecting supply and demand and maximizing the value of the region's natural resources.

However, the hard infrastructure needs the soft infrastructure to result in long-term success and make a positive development impact. Governments must carefully consider the soft elements of their legal, regulatory, and fiscal infrastructure. How will the projects be structured? What will be the local content and labor requirements to foster the growth of human capital? What are the terms of debt and will the government have future capacity to repay it? Lastly, and perhaps most importantly, are the "rules" and "terms" of each infrastructure project transparent?

In the *Future Calling: Infrastructure Development in Central Asia*, authors Dr. Ariel Cohen and James Grant explore the unprecedented capital expenditure outlays of these projects and analyze their potential for transformative economic progress. However, the hard and soft elements of these infrastructure projects must strike a balance between economic sustainability, social inclusiveness, and commercial viability. Sound and transparent projects, regardless of the source of finance, will foster economic growth and development. Bad projects, on the other hand, risk saddling countries with long-term debt and white elephants.

There is much attention in Central Asia and beyond on China's Belt Road initiative. China's renewed interest in this region, and the much-needed capital it brings to bear, comprise a critical pillar of Central Asia's infrastructure build-out strategy. Investments from likes of the World Bank, Asian Development Bank, Asian Infrastructure Investment Bank, European Union, Japan, the Middle East and the USA will also play an important part in realizing the potential of these projects.

Dr. Cohen and Mr. Grant provide a snapshot of the infrastructure needs along with a future view of Central Asia at the crossroads of the East-West and North-South trade routes. For the Central Asian Republics, location is indeed a blessing.

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I. Executive Summary

The Central Asian Republics (CARs) – Kazakhstan, The Kyrgyz Republic, Uzbekistan, Tajikistan, and Turkmenistan – are in the midst of a quiet yet remarkable economic transition on a scale not seen since the period immediately following the collapse of the Soviet Union. Leveraging their critical geography between the world’s largest markets, Central Asian governments are embarking on development strategies to increase regional/global connectivity, diversify and modernize their economies, and improve the welfare of their citizens. Behind these varying strategies for growth lies a common thread: infrastructure development.

Infrastructure (and its value chain) is the bedrock of economic opportunity – it facilitates trade, increases productivity, promotes knowledge sharing, and creates an environment for economic and even social innovation. For this reason, quality infrastructure development is both a top responsibility and top priority of the state. Eager to unlock the potential of their respective economies, the CAR’s are – to varying degrees – pursuing their own infrastructure build-out programs. Increasing urbanization, population growth, and rising energy demand are fueling this demand for energy, transport, and digital connectivity expansion. However, budgetary, technical, and bureaucratic constraints across the region mean that states on their own have been unable to meet domestic demand for infrastructure needs. Subsequently, the CARs have turned to external partners – nation-states, international financial institutions, and private companies -- to attempt to bridge the infrastructure gap.

The Asian Development Bank (ADB) projects that USD 33 billion per year will be needed between 2016 and 2030 to tackle the massive infrastructure requirements of Central Asia.¹ The CARs inherited a decrepit Soviet-era infrastructure network oriented for north-south trade. Today, however, international trade flows are no longer dominated by Moscow. East-West trade, which now includes Western Europe and China, is emerging as the future of Central Asia’s economic destiny. Furthermore, despite geopolitical difficulties, North – South trade towards the Indian ocean is also developing. New partnerships, new technologies, and new ideas will be needed for Central Asia to reach its economic potential. Renewable Energy Resources (RES) and Information Communication Technology (ICT) are among the most promising sectors for realizing this potential.

Borrowing for these projects, however, is constrained due to rising budget deficits and debt sustainability concerns across Central Asia. Relatively low commodity prices – the backbone of Central Asia’s economic growth – are straining state budgets, while population growth and increasing urbanization necessitate increased infrastructure spending. As national debt levels rise, responsible governments have put stricter fiscal policies into effect. Together these factors limit the ability of governments to address infrastructure needs through the state budget.²

Given these constraints, China’s estimated \$1 trillion Belt and Road Initiative (BRI), fueled by Beijing’s economic and geopolitical ambitions, is a tremendous resource for Central Asian economies.³ Indeed, infrastructure development across Central Asia’s transport, energy, and telecommunication sectors is dominated by Chinese funding. China’s perfect storm of excess capital, manufacturing overcapacity, increasing demand for natural resources, and a desire to be respected as a major player in international affairs have combined to create this massive initiative.

But while the BRI can be a great facilitator for connectivity and development in the region, Central Asian countries must be active in the management of the belt and road projects passing through their territory if they hope to maximize local input -- and impact. In addition, participants of China’s BRI – particularly

those which are overly dependent on China as a trade partner and creditor – run the risk of debt spirals and dangerous exposure to market shocks.

The Kyrgyz Republic and Tajikistan, for example, respectively owe 40% and 50% of their public debt to China.⁴ BRI commercial loan repayment will exacerbate the hazards of debt distress among the CARs, and therefore they must exercise caution in their approach to investment relations with Beijing. This is to say nothing of the potential geopolitical ramifications of BRI, which could place traditionally strong relationships with the West in jeopardy if not marshalled properly by CAR governments.

With BRI investment posing both risk and reward, Central Asian countries should seek balance and continue to identify private investment through whatever means and mechanisms available. Multilateral Development Banks (MDBs), which ushered Central Asia into global free-market economy into the 1990s, are a historically promising source of investment. Public-Private Partnerships (PPPs), which come with fewer constraints but require more sound business environments, are an increasingly attractive instrument for infrastructure development in Central Asia. To paraphrase from the 1990's oil and gas pipeline development boom, "happiness is multiple investors."

II. Macroeconomic Overview

The Central Asian republics, taken together, are characterized by low population density, high ethnic diversity, and rich natural resources – particularly hydrocarbons, water, and arable land.⁵ As the CARs pursue their own unique strategies for development, there is a common need to more efficiently exploit existing resources and diversify their commodity-centered economies. Quality infrastructure in the forms of roads, power plants, ports and airports, and telecommunications networks are the key to achieving these development goals. The required large-scale capital expenditures, however require business-friendly climates – a prerequisite for appreciable private investment.

Central Asian economies rely heavily on remittances and commodities, which makes them vulnerable to external shocks. Since 2014, they have been hit by a fall in commodity prices and a slowdown of their principal economic partners such as China and Russia.⁶ To diversify and modernize their economies, governments are attempting to integrate their countries into global trade and investment flows through structural and institutional reforms, and with both state and private sector involvement.

Although Central Asia only comprises five countries, important sub-regional patterns and divergences exist. The GDP and GNI per capita of each state fall below the world average, but two countries clearly outperform the rest of the group. These two, Kazakhstan and Turkmenistan are considered upper-middle income, whereas the Kyrgyz Republic, Tajikistan and Uzbekistan are categorized as lower-middle income economies (Table 1). Moreover, there are sweeping differences between the richest and the poorest country in the region: Kazakhstan's GDP per capita is more than ten times higher than that of Tajikistan.

	Population (millions)	GDP (USD millions)	GDP per capita (USD)	GDP Growth (annual percent)	GNI (USD millions)	Net FDI/GDP (neg. sign = inflows)
Kazakhstan	18.04	159,407	8,837	4.0	142,274	-3.0
Kyrgyz Republic	6.20	7,565	1,219	4.6	6,990	-6.7
Tajikistan	8.92	7,146	801	7.1	8,846	-3.0
Turkmenistan	5.75	42,355	7,356	6.5	38,266	-6.1
Uzbekistan	32.39	48,718	1,504	5.3	64,236	-0.2
CAR Avg.	14.26	53,04	3,943	5.5	52,122	-3.8

Source: World Development Indicators database, World Bank⁷

	Overall Rank	Starting a Business	Construction Permit	Electricity access	Property Registration	Paying Taxes	Border Trading	Contract enforcement
Kazakhstan	36	41	52	70	17	50	123	6
Kyrgyz Republic	77	29	31	164	8	151	84	139
Tajikistan	123	57	136	171	90	132	149	54
Turkmenistan	-	-	-	-	-	-	-	-
Uzbekistan	74	11	135	27	73	78	168	39

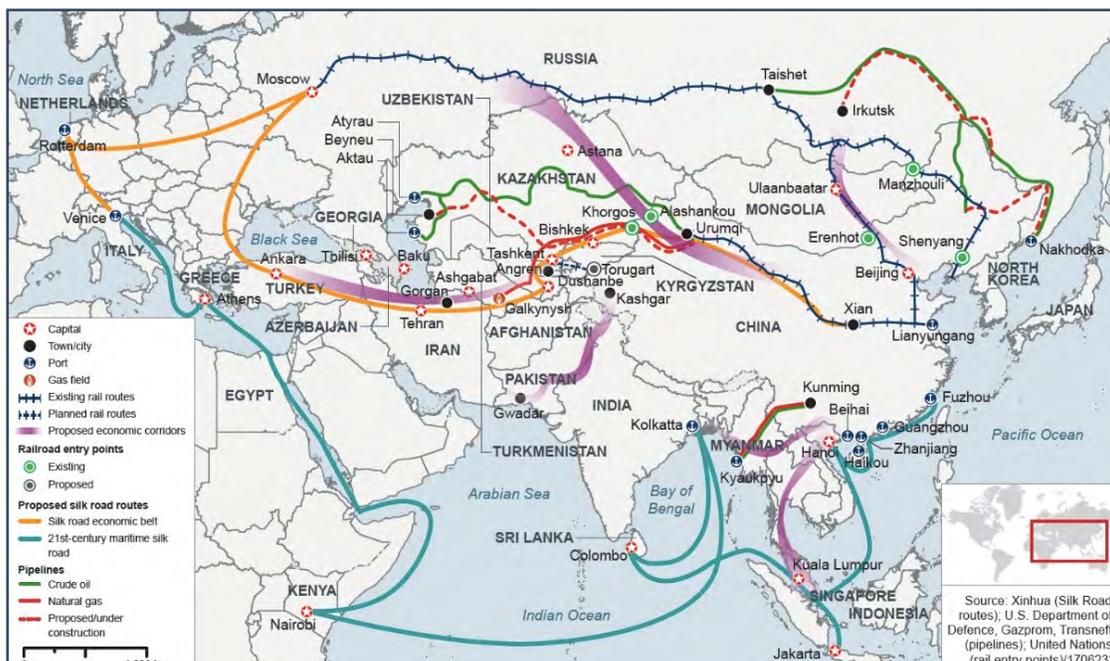
Source: World Bank Doing Business Report 2018.

Overall the CARs have shown significant progress in fostering more business-friendly environments (Table 2). According to World Bank indicators, the region's governments have enacted incremental fiscal, regulatory, and political reforms that have indeed improved economic growth. From increased electricity access to corporate tax regulations and strengthened rule of law, Central Asia is becoming a more attractive destination for investment, from China and beyond.

III. The Belt and Road Initiative (BRI)

Central Asia: The Transeconomic Bridge

There is perhaps no greater single driver of infrastructure growth in Central Asia than Chinese economic activity. The region is the lynchpin of Beijing's bold Belt and Road Initiative (BRI), which aims to link China's economy to South Asian and West Asian, African, and European markets by air, land, and sea, reformatting the Eastern hemisphere as we know it. The People's Republic of China (PRC) is investing a purported \$1 trillion into the international megaprogram. From an economic stand-point, the strategy would better insulate China from potential debt deflation and economic slowdowns in Western markets. The 2008 financial crisis, which exposed China's export dependence on the U.S. and Europe was a rude awakening for the PRC.



Source: IHS Markit 2017⁸

The initiative also addresses China's chronic "overaccumulation crisis" stemming from industrial overproduction and cooling economic growth. Global infrastructure projects serve a release valve for excess manufacturing – shielding the Chinese economy from inflation and unemployment. There are major geopolitical considerations as well.

Central Asia is not only strategically located between the world's largest markets but also contains vast natural resources which are critical to China's economic security. Hydrocarbons (notably oil and gas) from Kazakhstan and Turkmenistan, rare earth minerals and precious metals from Kazakhstan, Tajikistan, and Kyrgyzstan are needed in large quantities to feed the world's largest economy (by purchasing power parity). Over the past decade, China has poured billions of dollars of investment into the CARs to guarantee access to these economic inputs.

BRI will consist of two primary trade routes. The first, known as the "Maritime Silk Road", will connect China's economic interest via sea lanes. The second – "The Silk Road Economic Belt" or SREB – envisions Central Asia as a transnational economic bridge between the world's two largest markets – China and

Europe. Highways, railroads, and pipelines will form the sinews and blood vessels connecting China's manufacturing powerhouse with economies further west. Due to its geographic location, Kazakhstan is the heart of Belt and Road, or as some suggested, is the "Buckle of the Belt."

Home to the China–Central Asia–West Asia Corridor, the Eurasian Land Bridge, and the Khorgos–Aktau railway, Kazakhstan has received upwards of \$14 billion in Chinese investment over the past decade.⁹ The two countries are now cooperating on 51 bilateral projects with total investment value of \$27 billion, including the \$3 billion China-Kazakhstan Crude oil pipeline.¹⁰

All five Central Asian states will continue to attract financing from China's \$40 billion Silk Road Fund. Chinese financial institutions, State Owned Enterprises (SOEs), and private networks will offer additional channels of investment. Rising external debt amongst the CARs could be an issue, however, as certain Central Asian recipients of Chinese investment are particularly vulnerable to debt distress.

BRI and Debt Distress

Kyrgyzstan and Tajikistan, less affluent than their hydrocarbon endowed peers, may be ill-equipped to cope with rising external debt stemming from Chinese infrastructure investment. Tajikistan is the least developed of the Central Asian Republics but is eager to leverage its geography as the "jumping off point" for a number of China's overland belt and road projects. The Central Asia-China gas pipeline is perhaps the largest SREB initiative involving Tajikistan. The state will host "Line D" of the natural gas mega-project at a cost of \$3 billion, adding yet more to its growing foreign debt.

China is Tajikistan's largest creditor, accounting for 80% of the Republic's increase in external debt between 2007 and 2016.¹¹ Tajikistan's debt is expected to reach 56.8% of GDP by the close of 2018 – up from 33.4% of GDP in 2015. Despite this, the Tajik government has made clear that it intends to increase its debt burden (at concessional and non-concessional rates) to further fund infrastructure projects in the country.

Kyrgyzstan, the second smallest economy in Central Asia is in a similarly vulnerable position. The Republic holds the highest debt-GDP ratio of any Central Asian country -- 65% projected in 2018 (up from 62% in 201) and hosts a number of SREB projects.¹² These include large hydropower developments as well as the China-Kyrgyzstan-Uzbekistan railway. Even without taking on additional debt, its current liabilities expose the country to risks of rapid exchange rate devaluations or other economic shocks. While BRI offers tremendous opportunities for lower-income nations seeking to grow their economies, the high risk of China-driven debt distress should not be ignored.

BRI and the West

Since 1991, Western development agencies have been instrumental in providing Central Asia states with the frameworks and regulatory tools necessary for their transition to market economies. Indeed, Western companies were among the top beneficiaries of free market reforms, developing profitable industries including commodities, transportation, and banking. With liberalization came a parade of foreign financial institutions, access to capital/credit, and technical know-how, thereby laying the foundation for the infrastructure investment we see today. Whether Chinese economic influence will crowd out Western business or facilitate it remains to be seen. Clearly it is not in the interest of CARs to become economic appendages of any great power.

U.S. and Western companies are eager to capitalize on the trillion-plus dollars expected to pour into BRI development. The U.S. service sector is one such example, particularly in the construction of high-tech

digital infrastructure. Western companies have a comparative advantage over Chinese competitors, as Beijing has shown a penchant for digital censorship, online privacy erosion, and IP theft -- thus making Western digital providers that much more attractive.

America's General Electric (GE) made sales of \$2.3 billion in equipment orders from Belt and Road projects in 2016, almost three times the total for 2015. The firm expects to enjoy double-digit growth in revenues along the transnational corridor in coming years. Other fortune global companies such as Caterpillar, Honeywell, and ABB, DHL, Linde, BASF, Maersk Group are involved in billions of dollars' worth of BRI activities.

But even as U.S. companies benefit from belt and road projects across Central Asia, Western perceptions of a geopolitical-power play could lead to a strain in diplomatic relations if not managed carefully. Among U.S. security experts, commercial and economic competition still remains poorly understood, and thus is not well integrated into American national security strategy. Policy-makers therefore tend to over-militarize Chinese actions, leading to heightened suspicion. Central Asian leaders should be aware that over-enthusiasm to embrace BRI, particularly in the spheres of security/defense, may jeopardize strong and longstanding relationships.

It remains to be seen whether the primary motivations behind BRI are financial or geopolitical, or both, but in either case, Beijing has deemed the global networking strategy to be in China's interest. Those involved in bilateral and multilateral dealings with China on BRI initiatives would be wise to keep in mind that altruism is not the chief driver of great powers' foreign policy.

IV. Key Infrastructure Developments

Overview

Infrastructure benefits economies and social well-being through the facilitation of trade, increased productivity, and expanded access to key services. Demand for new infrastructure is outstripping the rate at which new projects are being added – owing largely to urbanization, population growth, and robust economic activity. State governments in Central Asia generally lack the capacity, technical knowledge, or budget to meet these needs on their own.

The Asian Development Bank (ADB) estimates that developing countries in Asia will need to invest up to USD 1.7 trillion per year on infrastructure through 2030.¹³ Current investments stand at USD 850 billion per year, which suggest that a significant infrastructure gap exists. The power sector is expected to require over 50% of these investments followed by Transportation (35%) and Telecommunication (10%). Central Asian infrastructure is expected to require some USD 565 billion of that annual investment through 2030, according to the ADB.¹⁴

Transport

“If you want to develop, build a road” goes the Chinese saying. It is no surprise then that highway construction is a major component of the CAR's China-funded transportation infrastructure build-out. The Western Europe-Western China (WE-WC) Expressway, which will soon stretch from the port of Lianyungang, on the Yellow Sea in China, to the port at St. Petersburg, on the Baltic Sea in Russia, 8,445 kilometers away, was referred to as “the construction of the century” by Kazakh President Nursultan Nazarbayev. Part of this development will connect Kazakhstan's Khorgos Dry port with its Chinese counterpart Horgos via ultra-modern 4-lane highway crossing.

But not all roads are made of cement and asphalt – the most important ones are comprised of iron rail. The Baku-Tbilisi-Kars (BTK) Railway – referred to as “Asia’s Gateway to Europe” – will link 826 km of rail from Azerbaijan, Georgia and Turkey with Central Asia, thus connecting China’s Western border with Eastern Europe. The line will transport an annual volume of 6.5 million tons of goods, with a target of 17 million tons by the mid-2020s. Given the importance of the BTK project, most Central Asian countries including Kazakhstan, Afghanistan, Uzbekistan and Turkmenistan have expressed an interest in becoming connected to BTK – the shortest route linking the landlocked region with Europe.

The China-Europe Railway Express is another major project which includes 51 rail links connecting a total of 27 Chinese cities and 28 European cities. Current routes include the Hamburg-Harbin line, the Moscow-Kazan high-speed rail, and a pro-posed line from Mashhad, Iran, to Kashgar, China.¹⁵ Additional routes will stretch from the Chinese city of Xian to Belgium, as well as an 8,000-mile cargo route between Yiwu and Madrid.¹⁶ Today, cities like Chengdu are building new railway depots to deal with an increase in trade from Europe. This form of Sino-European trade is a positive development for Central Asian states, as the nations along the rail route can monetize, and receive transit fees that can help boost their economies.¹⁷

China-Central Asia Infrastructure Development



Source: Stratfor

Azerbaijan and Iran have also finalized a deal to finance the Rasht-Astara railway in addition to a 10 km long railway segment that connects Astara, Iran, to Astara, Azerbaijan. The railway forms part of the International North-South transport corridor which is a 7,200 km long shipping, rail and road route for freight transport between India, Iran, Afghanistan, Azerbaijan, Russia and Central Asia.¹⁸

For Central Asia, the most important port is perhaps in northeast China at Lianyungang. The cargo processing area, at a size of 220,000 square meters, hosts the Kazakh-Chinese joint terminal which delivers ten cargo trains per week to Astana, Almaty and Tashkent in Central Asia as well as Turkey further afield. As a result, land-locked Kazakhstan now has access to the Pacific Ocean, major Chinese cities and the hubs of Busan, South Korea and Osaka, Japan.¹⁹

Further, as part of the China-Pakistan Economic Corridor (CPEC) a deep-water port will be constructed

in Gwadar, Pakistan, which alongside the port of Karachi, will have land links to northern Pakistan, western China and Central Asia. Gwadar will also include a new free trade zone and 50 km of dock space. Situated only 300 miles from the Strait of Hormuz, Gwadar is set to become a major international port.²⁰ Pakistan is planning to connect Gwadar to CA through the Gwadar-Termez Motorway, spanning Tajikistan, Turkmenistan, Afghanistan, and Uzbekistan.²¹ Meanwhile, the Quadrilateral Traffic in Transit Agreement, a transit trade deal, which now involves China, Pakistan, the Kyrgyz Republic, Kazakhstan, and Tajikistan provides an alternative gateway to Central Asia without the involvement of Afghanistan. It uses the Karakoram Highway linking Pakistan's Gilgit-Baltistan to China's Xinjiang province.²²

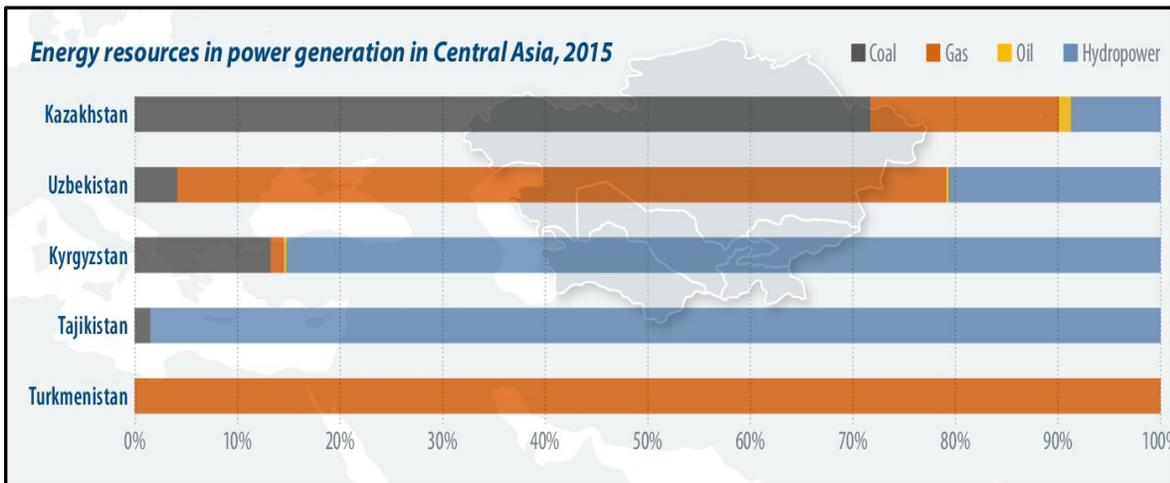
Dry ports are inland ports connected to a seaport by rail or road and serving as a transshipment point for goods. In Kazakhstan, at a cost of \$245 million, Khorgos, a centerpiece of China's BRI is set to become Central Asia's largest logistics park. In order to increase its economic output, Khorgos will host the International Center for Boundary Cooperation (ICBC), which is a 3.43 square km duty-free bazaar that has its own tax and fiscal codes as well as immigration policy. An important task of Khorgos as a gateway between East and West is to help transfer railroad container cars between two different railway gauges – the Russian broad gauge and the Chinese standard gauge. This will allow for the port to process up to 500,000 containers a year by 2020.²³

In terms of airports, Kazakhstan's role is similarly central. The country is engaged in major efforts to make Astana Airport an important international hub. It opened a new international terminal last year, doubling the airport's capacity to more than 8 million passengers annually.²⁴ Just recently, a \$140 million investment has been announced to build a new terminal and reconstruct runways for Kazakhstan's largest airport, Almaty Airport.²⁵ The government has been supporting the country's biggest airline, Air Astana, and in 2018 it announced the creation of a new airline on the basis of Zhetysu to cover local and regional routes.²⁶

Energy

Central Asia is a region endowed with tremendous natural resources. Chief among its wealth of commodities are hydrocarbons – oil, gas, and coal – which form cornerstones of the economies of Kazakhstan, Turkmenistan, and Uzbekistan. Kyrgyzstan and Tajikistan, lacking the fossil fuel resources of their neighbors, hold impressive hydropower potential. Universal among the CARs, however, is aging energy infrastructure and a difficulty in matching domestic capacity with rapidly growing electricity demand.

Table 3. Central Asia Generation Mix (2016)



Source: IEA

Oil & Gas

While the West has historically been an active investor in Central Asia's fossil fuel sector, the mantle of largest oil and gas financier now goes to China. In recent years, the region has received tremendous Chinese investments. Beijing's drive to import more energy from Central Asia is a sensible pillar of its energy security policy, as the PRC is dependent on foreign producers to meet 60% of its energy needs. Beijing understands that a successful energy security strategy requires a diversification of supply.

Two mega projects, The Central Asia–China Gas Pipeline and the Kazakhstan–China Crude Oil Pipeline dominate the oil and gas infrastructure landscape.

The Central Asia–China Gas Pipeline – soon to be the largest gas transmission system in Central Asia – runs from Turkmen-Uzbek border city Gedaim to Horgos in China's Xinjiang Uygur Autonomous region through Central Uzbekistan and South Kazakhstan.²⁷ Of the four lines, three 1,830 km parallel lines (A, B, C) from Turkmenistan to China through Uzbekistan and Kazakhstan are currently operational. The construction of line C was completed in 2013 and increased the total capacity of the pipeline to 55 billion cubic meters (bcm) a year which was equal to approximately 20% of China's annual natural gas consumption.²⁸ The major supplier of natural gas for all lines of the Central Asia – China Gas Pipeline is Turkmenistan.²⁹ By 2020, with the completion of the fourth line (Line D), which will transit Uzbekistan, Tajikistan and Kyrgyzstan,³⁰ annual gas export capacity from the pipeline will reach 85 billion cubic meters.

The Kazakhstan–China Crude Oil Pipeline is another BRI project meant to increase China's energy security. This 2,800 km (1,740 miles) pipeline links Kazakhstan's huge oil resources in the Caspian Sea with China's oil market by transporting crude oil from oil fields in Western Kazakhstan to Alashankou terminal station in China and then to the Dushanzi refinery in the Xinjiang Province of China. The total cost of building the pipeline is estimated at \$3 billion.³¹ It is divided into 4 segments. One of them is the Kenkiyak-Kumkol pipeline with a maximum capacity of 10 million tons per year or 200,000 b/d. The issue of increasing its capacity is now under consideration.³²

Western investments initiatives abound as well. American oil companies Chevron entered Kazakhstan's market in 1992 with a \$20 billion, 40 year deal to develop the Tengiz field. This project remains ongoing, with expansion plans underway to increase the current 272,000 b/d oil output.³³ Chevron and oil

major Exxon are both participants in the Caspian Pipeline Consortium which completed the Kazakhstani part of an expansion project in 2017. This new, \$5.4 billion³⁴ portion is expected to increase total throughput capacity to 1.4 million barrels per day. The pipeline system is considered the most convenient export option for Kazakhstan to export crude oil from its Tengiz and Kashagan fields.³⁵

Arab states are also interested in the region's oil and gas opportunities. Saudi Arabia is now investing heavily in the construction of the Turkmenistan-Afghanistan-Pakistan-India gas pipeline (TAPI). Earlier, liquidity was guaranteed by the Islamic Development Bank's loan worth \$700 million allocated to Turkmenistan, for the construction of TAPI's Turkmen section. The total length of the pipeline will be 1,814 kilometers, with 214 kilometers in Turkmenistan, running from Galkynysh, the country's largest, and the world's second biggest, gas field. The project would transport 33 billion cubic meters of natural gas every year to Pakistan, and eventually to India. Preliminary costs are estimated at \$10 billion.³⁶ Turkmenistan is counting on the project to diversify its gas markets as Russia has cut back its gas imports in recent years and Iran is no longer paying for its imports. Turkmenistan is now heavily dependent on export to China.

Renewable generation

Green energy is an as of yet underdeveloped sector in central Asia. Excluding large hydropower capacity, renewables range from 1% of Kazakhstan's energy profile up to 3% in Uzbekistan and Tajikistan.³⁷ One explanation is that high fossil fuel subsidies and low electricity prices significantly reduce the competitiveness of renewables projects. The limited presence of technology vendors and lack of technological and institutional knowledge (know-how) are also significant obstacles. That being said, there has been some positive movement. For instance, under the auspices of International Renewable Energy Agency (IRENA), the energy ministries of Kazakhstan, Turkmenistan, Uzbekistan, Kyrgyzstan, and Tajikistan have all pledged to pursue an accelerated build-out of renewable energy.

Wind

The vast Central Asian Steppe is an ideal location for wind power capacity additions. Kazakhstan is the regional leader in wind energy and has ambitious plans to accelerate the technology under its new "2050 strategy." The proposal hopes to achieve 50% of its electricity from renewable and alternative energy sources. Currently, only 50 alternative energy facilities are operating in the country while in three years that number is expected to grow to 100, of which 23 are wind energy plants (also includes 7 solar power stations, and 13 hydroelectric power stations, as well as plants capable of producing biogas).³⁸

Jiangsu Zhenfa Holding Group Co. Ltd investment company will start the construction of \$154.5 million wind and solar power stations in the South of Kazakhstan, near Kentau. The new facilities are expected to be completed within two years and generate 50 MW per hour of wind power and 30 MW per hour of solar energy.³⁹ Another wind farm with a capacity of 42 MW is planned to be built in Mangistau region near Fort-Shevchenko. Investors – including Kazakh company South Wind Power LLP and Chinese firm Horgos Jiuhe SilkBridge New Energy Co – are planning to allocate 20 billion tenge (\$ 60 million) to build 17 wind generators with a capacity of 2.5 MW each.⁴⁰ The new wind farm will provide electricity to 100,000 families in the region.⁴¹

Solar

Central Asia's solar market is still in its nascent stages. Two large-scale solar farms are operational in Kazakhstan -- the 50 MW Burnoye Solar-1 in the southern region of Zhambyl, and a 50 MW solar plant outside of Astana – with two more under development. The completed utility scale projects were backed

by the European Bank for Reconstruction and Development (EBRD). The two under construction – which include a 50MW expansion of Burnoye -1 and a new 50MW plant on the border of Uzbekistan, are being financed by a joint venture between Kazakhstan's sovereign wealth fund, and UK investing group G Energy Ltd.

China's Zhuhai Singyes Green Building Technology Co. Ltd won a tender for the construction of a solar photovoltaic plant in Uzbekistan on a turnkey basis in 2016. UzbekEnergy JSC and the Chinese company signed a \$147 million contract for the design, construction and operation of the solar power plant which will be located in the Samarkand Region. The total cost of the project is estimated at \$200 million and will be financed with a \$110 million loan from the Asian Development Bank, a loan of the Fund for Reconstruction and Development of Uzbekistan and equity of the Uzbekenergo JSC.⁴²

Hydropower

The Kyrgyz Republic is currently struggling to find a partner for the completion of its long-awaited Naryn hydroelectric project. According to a contract approved in August 2018, Liglass Trading, a Czech photovoltaic and hydropower investment company would have built and operated two large plants in the Upper Naryn cascade as well as 10 smaller ones with a capacity of 280 MW. Nonetheless, Liglass was unable to fulfil its obligations and pay US\$ 37 million to RusHydro, hence the government has cancelled the contract. Previously, a similar contract to develop these hydropower plants was awarded to RusHydro, but it was cancelled following fears that the Russian government is unable to follow through on proposed investments. Other similar projects, such as the Karambata-1 dam are also being discussed, but that would require even bigger financial commitments.⁴³

According to the estimates of the Asian Development Bank, Uzbekistan's hydro-power generation stands at only 1,800 MW out of an estimated 12,000 MW of hydropower potential to be developed.⁴⁴ Uzbekistan has long been opposed to hydropower projects domestically and in the neighboring countries due to the potential harm they could inflict on the agricultural sector and to the cotton crops in particular. However, the government's position on hydropower is gradually softening. According to the five-year plan developed for UzbekHydroEnergo, the company will construct 42 new hydropower plants and will modernize 32 more.⁴⁵

Information and Communications Technology

The landlocked nature of the CARs has important implications for the current state and future development of their information and communications technology (ICT) sector. First and foremost, they are unable to access international bandwidth directly using submarine cables leaving just two options: terrestrial and satellite networks. However, low population density, mountainous, desert terrain and enormous rural areas lead to higher per capita investment requirements.⁴⁶

**Table 4. Information and Communications Technology (ICT) penetration in Central Asia
2017 data with changes compared to 2010 within brackets**

	Kyrgyz Republic	Kazakhstan	Tajikistan	Turkmenistan	Uzbekistan
Population covered by at least a 3G mobile network	60 (+28)	82 (+36)	90	76 (+47)	45 (+5)
International Internet bandwidth (bit/s per Internet user)	65,377 (+63,951)	87,235 (+77,929)	2,421 (+1,152)	2,317 (-0,261)	24,650 (18,967)
Households with a computer	21.4 (+15.3)	84.4 (+40.4)	13.2 (+10.3)	13.4 (+6.4)	43.9 (+26.9)
Individuals using the Internet	34.5 (+18.2)	76.8 (+45.2)	20.5 (+8.9)	18.0 (+15.0)	46.8 (+30.9)
Fixed-broadband subscriptions (per 100 people)	4.1 (+3.7)	13.7 (+8.2)	0.1 (0)	0.1 (+0.1)	9.1 (+8.7)

Source: International Telecommunication Union⁴⁷

Political and governance problems are also present. Strained political relationships between Uzbekistan and its neighbors including Turkmenistan, Tajikistan and Kyrgyzstan have been a past obstacle to transnational ICT infrastructure. Moreover, regulatory bodies are far from being either technologically advanced or fully independent, and telecoms are generally state-owned (in Kazakhstan for example, state-owned Kazakhtelecom now controls two-thirds of the sector).⁴⁸ Overall, the results are high transmission prices and limited connectivity to fiber optic cables.⁴⁹ The role of large adjacent countries such as Russia or China in terms of improving the region's connectivity is enormous. And even if connectivity is assured, related services are far from being easily affordable for those living there.

International projects

The international donor community is involved in developing telecom infrastructure in the region. The Trans-Eurasia Information Network (TEIN), co-founded by the EU and initially launched in 2000 has been renewed for its 4th generation and offers an extensive research and education data communication platform for Asia-Pacific region.⁵⁰ The EU-funded Central Asia Research and Education Network (CAREN) was launched in 2009 and aims to "provide high-capacity internet network for the research and education (R&E) communities in Central Asia". CAREN3, its third project phase started in 2016 and with the build-out of a ring of 1 Gbps circuits, connecting Tajik and Kyrgyz R&E communities to their European peers and the rest of the world.⁵¹

The World Bank also has an initiative, called Digital CASA (Central Asia–South Asia Fiber Optic Network) that aims to provide an alternative to submarine connections, a more affordable internet and to support crowd-in private investment in the ICT sector.⁵² However, large neighboring countries play a key role in telecom infrastructure development.

Projects involving China

The Trans-Eurasian Information Super Highway (TASIM), which was put forward by Azerbaijan is yet to be completed. It aims to set up a “transnational fiber-optic backbone targeting primarily the countries of Eurasia from Western Europe to East Asia” and is underpinned by UN General Assembly resolutions.⁵³ The envisaged transit route would stretch from Frankfurt to Hong Kong/Shanghai. Participating operators include China Telecom (China), Rostelecom (Russia) and KazTransCom (Kazakhstan).⁵⁴

The Silk Road Gateway 1 (SRG1) cable system would link Pakistan to Oman with a 20Tbps submarine cable network and would also be connected to China, Turkmenistan, Afghanistan and Tajikistan. It was set to be completed by the end of 2017 but thus far is only operational between Gwadar and Oman.⁵⁵ Another project is a terrestrial link between China and the Kyrgyz Republic which has already been completed. Being the second alternative route, the Naryn-Torugart network was built by China Telecom and RTC. Recently, it was announced that they also plan to construct a third diverse fiber-optic route which would connect Balykchy to Naryn.⁵⁶

Chinese loans continue to dominate CARs’ telecom development. Uztelecom, the monopoly operator in Uzbekistan, secured a \$108 million loan from China Development Bank to fund a network expansion in 2013. Now, Uztelecom is planning on developing and offering LTE services as well.⁵⁷ Then again, Central Asian countries need to be aware of the risks associated with Chinese loans and must assess whether their price tag is truly justified.

V. Mechanisms and Opportunities for Private Investment

Adequate infrastructure is the obligation of the state – a critical piece of the social contract with its citizens. In Central Asia, it is apparent that these obligations cannot be met without the support of private and/or external investment. The CARs can draw from a host of funding instruments to help finance high-Capex infrastructure projects, the lion’s share of which fall into two categories:

- Traditional Multilateral Development Banks (MDBs)
- Private Public Partnerships (PPPs)

The characteristics of infrastructure projects often make them inherently unattractive and challenging for pure private investment: externalities are difficult to anticipate and price-in; high initial capital investments; long payoff periods; and threat of government control to prevent monopolistic behavior.⁵⁸ The financing mechanisms which involve MDBs and PPPs mitigate these challenges to some degree and can be deployed to great effect in Central Asia’s infrastructure build-out. Indeed, they already have. FDI has enabled the expansion of extraction industries and non-tradable services, export growth, and digital connectivity, all of which are a major sources of government revenue.⁵⁹

Table 5. Private Participation in infrastructure 1990 – 2015 (USD million)					
	Kazakhstan	Kyrgyz Republic	Tajikistan	Turkmenistan	Uzbekistan
Airports	31	x	x	x	x
Electricity	1,542	x	956	x	x
ICT	9,610	409	526	267	3,960
Natural gas	604	40	x	x	x
Oil	21,050	x	x	x	x
Railways	231	x	x	x	25
Ports	x	x	x	x	x
Road	x	x	x	x	x
Water and Sewerage	0	x 0	x	x	0
Total investment	12,018	449	1,482	267	3,985

Source: World Bank (x denotes no investment or data unavailable)

In terms of foreign direct investment, energy-rich countries with favorable regulatory and business practices – specifically Kazakhstan – has successfully attracted considerable external funding. The two principal motives behind FDI inflows to Central Asia are natural resources (such as energy and metals) and new markets in non-tradable sectors (real estate development or retail). Meanwhile, Central Asian countries should be motivated by possible technology transfers. Besides FDI flows into the extraction of natural resources and the transport of energy, sectors serving the domestic market (finance, communications, real estate etc.) are becoming more favorable targets for external investors. These sectors are especially important in the Kyrgyz Republic and Tajikistan, as they do not possess large hydrocarbon deposits.⁶⁰

Kazakhstan is the most important destination of FDI in the region, receiving over three-quarters of the funds destined for Central Asia (Table 6). To build off of this momentum, in 2017, its government adopted a new 2018-2022 National Investment Strategy. Developed with the assistance of the World Bank, the strategy aims to boost total FDI inflows by 25% by 2022.⁶¹

Table 6. Foreign Direct Investment Net Inflows 2017	
	Foreign Direct Investment (USD millions)
Kazakhstan	17,647
Kyrgyz Republic	466
Tajikistan	344
Turkmenistan	4,522
Uzbekistan	67
CAR Total	23,046

Source: World Bank

In an effort to create a financial hub attracting investments from China, the Middle East, and Central Asia, Kazakhstan has also opened the Astana International Financial Centre (AIFC). The AIFC is a ground-breaking program which is designed to improve the quality and reach of non-banking financial instruments; if successful, it will provide more opportunities to develop a whole new industry with highly skilled personnel, which will add value outside of the realm of extractive industries. AIFC also aims to ease domestic obstacles to capital formation and foreign and domestic investment by reducing bureaucratic delays, increasing transparency, and streamlining access to global financial markets.⁶²

In his state-of-the-nation address in October 2018, President of Kazakhstan Nursultan A. Nazarbayev declared that “the Astana International Financial Centre should play a pivotal role in providing business with foreign investment and access to capital”. He added that “to this end, we have created a separate court, financial regulator and stock exchange”, and that “all state agencies and national companies should actively use this platform and facilitate its rapid evolution and development”.⁶³

Multilateral Development Banks (MDBs) and other International Financing Initiatives

Multilateral Development banks are not only a primary source of external investment for the Central Asian Republics, but also drivers of pro-market reforms that make private investment practical. Since the collapse of the Soviet Union in 1991, MDBs have been active in supporting the economies of Central Asia transition to open, liberalized, and transparent markets. Multilateral donors currently offer loans at concessional interest rates far below market value, though strict conditionalities do have the potential to extend project implementation. To support investments, their offer includes the following:

- Improving governance and institutions
- Promoting regional cooperation and integration
- Enhancing macroeconomic resilience
- Supporting project finance and public-private partnerships

The Asia Development Bank (ADB) is among the most active MDBs in the region, adding value to CAR

economies by providing private sector investment and development, knowledge transfer, innovation support, and capacity building.⁶⁴ Between 2017 and 2019, ADB plans to invest \$2.65 billion in Uzbekistan's energy sector, \$800 million in Kazakhstan's transport sector, and \$25 million in Tajikistan's water sector. ADB infrastructure investments in the CAR are estimated to reach \$6.7 billion in this period.⁶⁵

The ADB's Central Asia Regional Economic Cooperation (CAREC) Program is a common undertaking of six multilateral development partners and 11 countries, including the five Central Asian Republics, to promote regional economic cooperation. CAREC's investments in member countries have amounted to \$30.5 billion over 182 projects since 2001.⁶⁶

The World Bank (WB) and European Bank for Reconstruction and Development are also active in Central Asia's infrastructure growth, seeking private and public partners to deploy capital. The EBRD is engaging primarily with Kazakhstan, Kyrgyzstan, and Tajikistan with a focus on energy, pumping EUR 1.4 billion into that sector.⁶⁷ The WB has approved \$3.45 billion of investment across central Asia between 2014 – 2016 with roughly one-third of this spending dedicated to infrastructure, with Kazakhstan (\$980 million) and Uzbekistan (\$700 million) receiving the lion's share of pure infrastructure investment.⁶⁸

Another important player is the Overseas Private Investment Corporation (OPIC), which aids American business investment in emerging markets. OPIC is active in all Central Asian countries (albeit in a limited capacity) with the exception of Turkmenistan.⁶⁹ The institution has recently supported a university campus expansion in Tajikistan, a special purpose investment fund to promote lending to SMEs in the Kyrgyz Republic, and a memorandum of understanding (MOU) with Kazakh Invest for \$500 million to "strengthen communication, coordination, and relationships to help catalyze economic growth, development, and investment" in Kazakhstan.⁷⁰

What are PPPs?

There is no one widely accepted definition of public-private partnerships (PPP). The World Bank defines a PPP as such:

"PPPs are a long-term contract between a private party and a government entity, for providing a public asset or service, in which the private party bears significant risk and management responsibility, and remuneration is linked to performance."

PPPs typically do not include service contracts or turnkey construction contracts, which are categorized as public procurement projects, or the privatization of utilities where there is a limited ongoing role for the public sector. An increasing number of countries are enshrining a definition of PPPs in their laws, each tailoring the definition to their institutional and legal particularities.

World Bank (2018) <https://ppp.worldbank.org/public-private-partnership/overview/what-are-public-private-partnerships>

OPIC will soon undergo a considerable revamp that will hold important consequences for financing projects in Central Asia. If passed by Congress, a new body – the International Development Finance

Corporation (IDFC) – will step into OPIC’s place and diversify its current debt-only services: it will be now able to acquire equity in projects. Further, its budget aimed at development financing will be doubled to \$60 billion.⁷¹ IDFC represents a considerable resource for potential businesses and third-party investors interested in Central Asia’s infrastructure development.⁷²

Public-Private Partnerships (PPPs)

Of the various mechanisms for investment, the public-private partnerships (PPP) framework may yield the best results for those seeking to participate in Central Asia’s infrastructure build-out.⁷³ PPPs align incentives, ease the pressure on public finance, and may lead to more efficient public services and significant savings over large projects lifecycles. Perhaps most importantly, they allow governments to allocate risks to the private sector.⁷⁴ Conditions, however, must be favorable to attract and realize successful PPPs. This means a level playing field for all participants, clear and transparent government regulation, low perceived governance risks, ease of access to permitting, land, and other resources, as well as a manageable tax burden.

Both Tajikistan and the Kyrgyz Republic have fully developed PPP laws, while Kazakhstan has established two related agencies meant for coordinating PPPs. Uzbekistan showed particular interest in launching PPP projects mainly to overcome budgetary constraints. Since 1990, all these four countries have had some PPP projects reaching financial closure, though the numbers are limited (Table 7).⁷⁵

The transportation and oil/gas sector have historically been targets of heavy private investment including private-public partnerships. However, this means that these markets are more saturated or mature relative to others such as renewable energy resources (RES) and information technology. With Central Asian governments eager to de-commoditize their economies, these two rapidly growing sectors are an ideal entry point for new private investment, both for turnkey construction projects and concession-based PPPs.

The regional PPP leader, Kazakhstan, is a strong candidate for new wind and solar power sector development. In his state-of-the-nation address in October 2018, President Nazarbayev spoke about the special need to develop “areas of the future economy”. Besides fields such as big data and the Internet of Things (IOT), he high-lighted the importance of alternative energy as “[renewable resources] determine the global position and role of the country in the future”.⁷⁶

Fifty-eight Kazakh enterprises currently use renewable energy sources (RES) with a total capacity of 352 megawatts. That figure will grow to 68 facilities and approximately 490 megawatts by the end of the year.⁷⁷ In Kazakhstan it is evident that the geography, incentives, and investment/regulatory environment align for this sector to thrive.

To achieve the ambitious renewable energy-related goals of its “Strategy 2050”, Kazakhstan needs new private sector investments, and cannot rely alone on MDBs or government funding. Kazakhstan boasts the highest Doing Business ranking within the region and has attracted the largest sum of external private investments thus far. It also has some experience in PPPs and established a unique set of two dedicated agencies that help project preparation and provide advice to line ministries in terms of PPP-related tasks.

Table 7. Number and Investment Volumes of PPP Projects Since 1990		
	Projects reaching financial closure	Total investment committed to PPPs (millions USD)
Kazakhstan	8	885
Kyrgyz Republic	2	5
Tajikistan	3	956
Uzbekistan	2	320

Source: PPP Knowledge Lab⁷⁸

Uzbekistan is another strong contender for RES investment. The Republic has expressed interest in solar projects, a sub-sector in which it has tremendous potential, as well as hydropower. Uzbekistan has already signed a mandate with the International Finance Corporation (IFC) to boost private investment in the hydro sector and is eager to identify potential partners. Furthermore, it has achieved remarkable improvements in its business climate, as reflected by the WB's "Ease of Doing Business" report. The country has recently asked the EBRD to provide assistance in the development of an updated, investor-friendly PPP regime.⁷⁹

As CAR governments make a concerted push for digitizing their economies, the ICT sector presents a similarly good opportunity for public-private cooperation. With several projects ongoing and many more planned, the information technology is another sector ripe for investment. As China aims to play a major role in the sector, security and privacy concerns over telecommunications, compounded by fears of Beijing's "debt trap diplomacy" may push CARs to look for other alternatives.

Kazakhstan is already dedicating significant resources to developing its ITC infrastructure (table 5) and has made the digital economy a pillar of its 2050 strategy. Uzbekistan, despite its impressive reform process, is severely lagging behind in terms of 3G (and more advanced) mobile network infrastructure. Kyrgyz Republic aims to become a key digital destination and has recently made efforts to leverage ICT in order to reduce corruption and strengthen transparency. Significant market opportunities should therefore exist for Western/non-Chinese investment in this sector as the demand is present but suitable donors have yet to emerge.

Instruments of Infrastructure Investment

BRI

Offers a deep well of financial resources without same business environment preconditions of private investment and none of the (reform) constraints associated with MDB loans. This makes China an attractive partner, but there are caveats to such a relationship. High interest rate (non-concessional) loans and overexposure to Chinese credit can place already vulnerable economies into even more hazardous circumstances. The risk of debt traps, secession of sovereignty, and imperiled relationships with Western allies are all factors which must be weighed before (over) committing to BRI funding.

MDBs

Multilateral funding sources are a low-interest low-risk means of acquitting investment capital. Since the collapse of the Soviet Union, these institutions have played a pivotal role in reforming the economies of Central Asia. Funding, however, is conditional, meaning that projects may be delayed until specific requirements are met, if they can be successfully met at all. Investments from these mechanisms do have secondary and tertiary benefits to liberalizing economies, as mandated reforms often foster a business environment more conducive to private activity. Patience and political/market adaptability are prerequisites for successful MDB deployment.

PPPs

If adequate conditions are met, private-public partnerships have the potential to be the single greatest mechanism of infrastructure investment in Central Asia. Supportive PPP frameworks must be in place, as well as regulatory certainty and a level playing field for market competition. Indicators for doing business in Central Asia have improved dramatically over the past several decades – and inflows of private capital have followed. This portends greater private investment participation, especially as the governments of the Central Asian Republic continue to liberalize and open-up their economies. In terms of greatest potential impact, PPPs should look to the still nascent but burgeoning RES and ICT sectors. These markets are not saturated relative to fossil fuel and transport networks, and demand for capacity increases are greater. With state governments committed to the de-commoditization of their economies, relatively low capital expenditures and resounding public support, green energy and digital infrastructure sectors are ripe for new private investment.

VI. Conclusion

As the Republics of Central Asia continue on their trajectory of steady economic development, there will be a parallel increase in demand for connective infrastructure in the forms of energy, transport, telecommunications, and beyond. Macroeconomic realities dictate that CAR governments will not be able to meet these needs on their own, leading to the emergence of an infrastructure gap. To bridge this gap, Central Asia will need to work with investment mechanisms of all different varieties, including commercial banks, capital markets, such as AIFC, Belt and Road funding from China, International Financial Institutions, nation-states' loans, and private partnerships. Each comes with its own advantages and disadvantages, and it will be up to the leadership of CAR governments to strike the appropriate

balance to maximize efficient and successful execution of investment capital. In development of its infrastructure, CARs will have to pay special attention to environmental factors, keeping in mind the tragic past of environmental catastrophes in the region: the tragedy of the Aral Sea disappearance as the result of irresponsible irrigation schemes, Soviet nuclear tests in Kazakhstan's Semey (Semipalatinsk), etc. In addition, transparency and the rule of law will be paramount in this process.

Yet, the future of Central Asian infrastructure development is bright. With Kazakhstan blazing the trail, and Uzbekistan catching up, the region is finally arriving into the 21st century, despite the high capex costs and serious – but surmountable – geopolitical and geo-economic challenges.

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