

**ENVIRONMENT DIRECTORATE
ENVIRONMENT POLICY COMMITTEE**

GREEN Action Task Force

**Sustainable Infrastructure Development for a Low-Carbon Transition in
Central Asia and the Caucasus: Mapping of Potentially High-impact
Infrastructure Projects and Needs Assessment**

Strategic Infrastructure Planning for Sustainable Development in Kazakhstan

This paper was prepared for discussion at the OECD GREEN Action Task Force Annual Meeting 30 September – 1 October 2019, Paris.

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4. Strategic infrastructure planning for sustainable development in Kazakhstan

Overview

Kazakhstan is an upper-middle income country and the richest country in Central Asia, but its economy remains highly dependent on fluctuations in the oil and commodity markets. Recent economic reforms have brought the investment climate closer to international standards on a number of international metrics, making Kazakhstan the main recipients of foreign direct investments in Central Asia (71%), mainly from the European Union and the United States, while the Russian Federation and the People's Republic of China represent only 6% and 5% of total FDI inflows.

However, an important bottleneck to Kazakhstan's economic development is the state of infrastructure systems, particularly in transport. Around 75% of existing transport infrastructure requires replacement or rehabilitation, and USD 292 billion (or 3.93% of GDP) on average needs to be spent on infrastructure until 2040 to support economic and demographic growth.

Kazakhstan has strong institutional capacities for strategic infrastructure planning compared to neighbouring countries, and it has developed a series of long-term planning documents to define its economic and development goals. For instance, *Nurly Zhol*, Kazakhstan's main infrastructure development strategy, aims to harness the momentum of regional initiatives such as the BRI and CAREC to transform Kazakhstan into a strategic hub between China and Europe. However, current investment plans in energy and industry are insufficiently aligned with long-term vision of diversifying its economy away from fossil fuels and extractives. For instance, in the energy sector, coal plants still represent more than 15% of planned power plants by capacity, contributing to further carbon lock-in. In industry, most project planned and under construction are still in mining and petrochemical production.

Kazakhstan's updated Environmental Code, which will make Environmental Impact Assessments and Strategic Environmental Assessments mandatory, is still awaiting adoption. Kazakhstan's infrastructure investment decisions do not currently benefit from the insights of these assessments or other project-level screening mechanisms. Additionally, there is suboptimal coordination between different government institutions and environmental concerns are not systematically mainstreamed into infrastructure decision-making processes.

4.1. State of play: economy, investment and climate change in Kazakhstan

Economy and trade

Table 4.1. Key indicators on Kazakhstan's economy

Population (2018)	18 276 499
Urbanisation rate (2018)	57%
Annual population growth (2018)	1.3%
Surface area	2 724 902 km ²
GDP (USD, current price, 2018)	170 539 million
GDP per capita (USD, current price, 2018)	9 331
Real GDP growth (year-on-year change, 2019)	3.2%
Inflation (average consumer price, y-o-y change, 2017)	7.4%
Exports of goods and services (% of GDP, 2017)	34.4%
Imports of goods and services (% of GDP, 2017)	26.3%
FDI, net inflows (% of GDP, 2018)	0.1%
General government net lending/borrowing (% of GDP, 2019)	1.4%
Unemployment (% of total labour force, 2018)	4.9%
Remittances (% of GDP, 2018)	0.4%
Transparency, accountability and corruption in the public sector rating (1= most corrupt, 6 = least corrupt)	N/A

Source: World Bank (2019^[1]), *World Development Indicators (database)*, World Bank, <https://datacatalog.worldbank.org/dataset/world-development-indicators>; IMF (2018^[2]), *World Economic Outlook: October 2018*, International Monetary Fund, https://www.imf.org/external/datamapper/GGXCNL_NGDP@WEO/OEMDC/ADVEC/WEOWORLD

Economy and demographics

Kazakhstan is an upper-middle income country and the richest country in Central Asia. In fact, Kazakhstan is the only non-Baltic former Soviet state to surpass the Russian Federation in per capita GDP. The country's GDP fell sharply immediately after the breakup of the Soviet Union, but had recovered by the early 2000s by virtue of a sustained period of accelerated growth. In recent years, growth rates have closely followed fluctuations in the oil market, since crude oil is Kazakhstan's most important export at 45% of total export value (Observatory of Economic Complexity, 2017^[3]). Kazakhstan is a service-oriented economy, with services accounting for 61.65% of its GDP compared to 33.52% for industry (including mining) and 4.83% for agriculture (OECD, 2018^[4]).

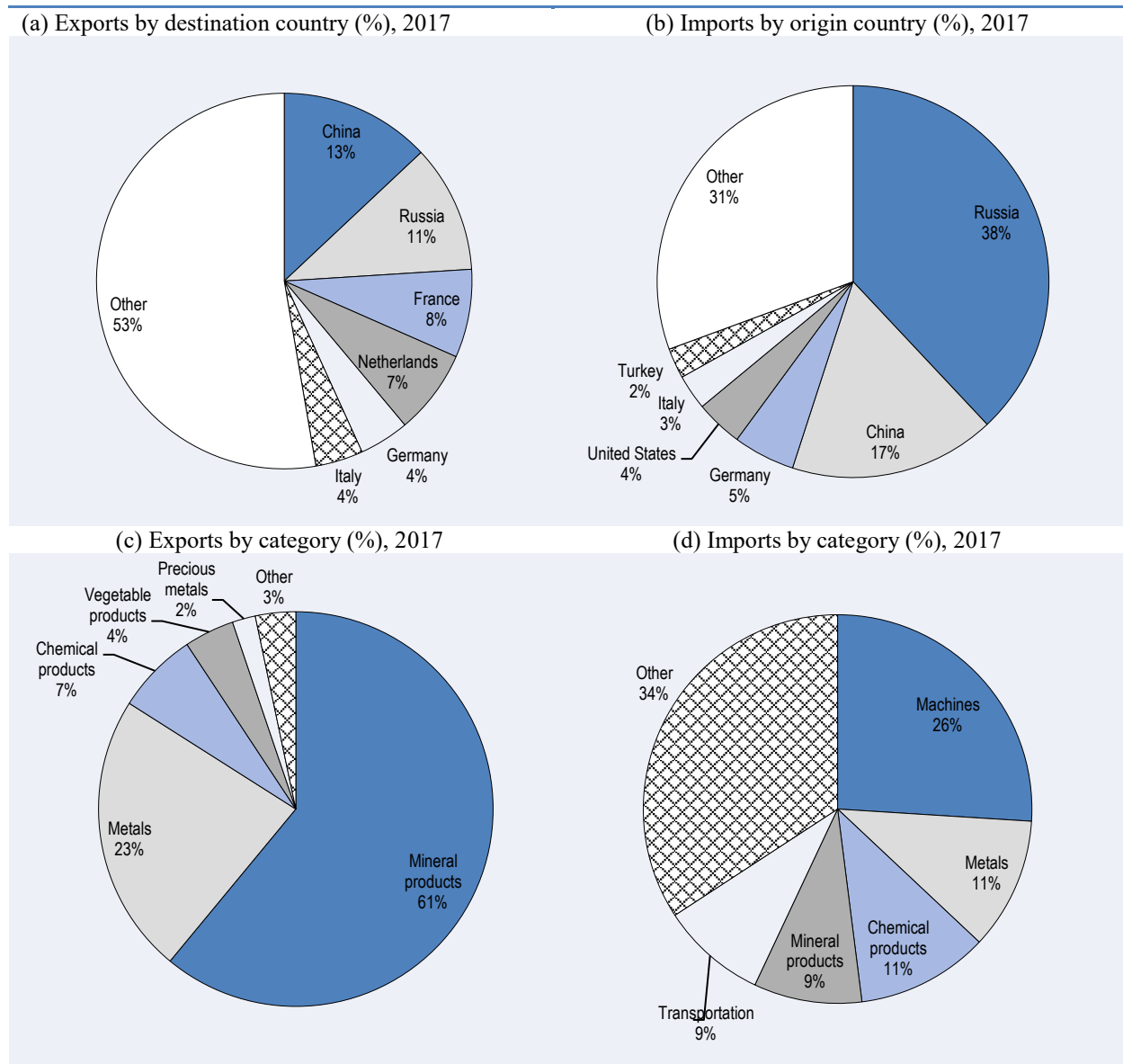
Although the country's post-independence population contracted throughout the 1990s, its population surpassed its 1991 peak of 16.5 million in 2011 and has since grown to over 18 million, and given its fertility rate of over 2.7 births per woman it is expected to grow further (World Bank, 2019^[1]). At 57% of the population, Kazakhstan's urbanisation is the highest in Central Asia (see Table 4.1).

Trade

In 2014, Kazakhstan signed the treaty forming the Eurasian Economic Union along with Belarus and the Russian Federation, and the bloc quickly expanded to include both Armenia and the Kyrgyz Republic. 41% of Kazakhstan's imports come from the Eurasian Economic Union countries, but almost all come from the Russian Federation, which accounts for 38%

of total imports (see Figure 4.1(b)). The European Union and the People’s Republic of China are also significant import origins, at 20% and 17% respectively. Kazakhstan’s relationship with the two regional trading blocs is reversed for its exports: 46% of exports go to the European Union, compared to 12% to the Eurasian Economic Union (again, almost exclusively to the Russian Federation: 11% of total exports) (see Figure 4.1(a)). China is Kazakhstan’s single largest export destination country, accounting for 13% of total exports.

Figure 4.1. Trade of Kazakhstan



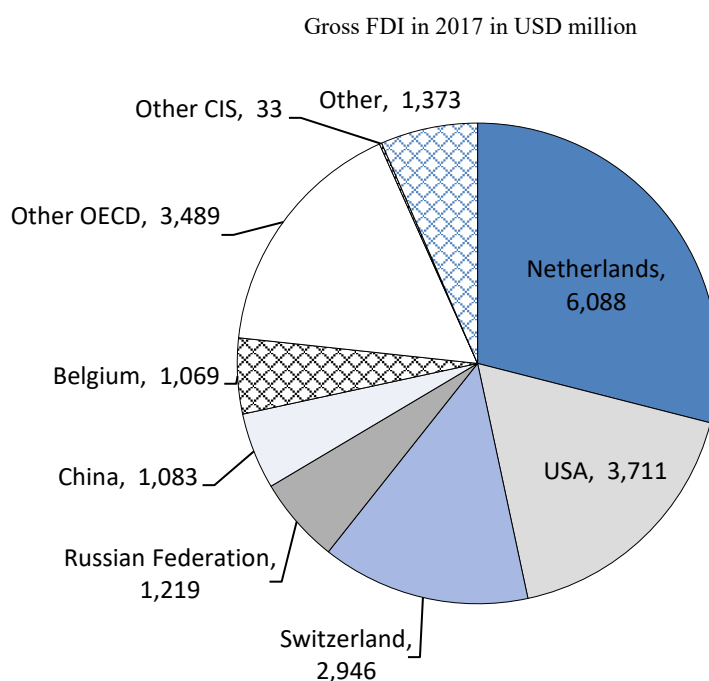
Source: Observatory of Economic Complexity (2017^[3]), *Kazakhstan: Exports, Imports and Trade Partners*, Observatory of Economic Complexity, <https://atlas.media.mit.edu/en/profile/country/kaz/>

Kazakhstan is a net exporter with a positive trade balance of USD 13.6 billion in 2017 (Observatory of Economic Complexity, 2017^[3]). Crude petroleum is by far the country's largest export at 45% of total exports by value. Extractives dominate Kazakhstan's exports with mineral products (including crude oil) and metals accounting for 61% and 23% of exports respectively, while precious metals make up a further 1.9% (see Figure 4.1(c)). Notably, crude exports (45%) dwarf the share of refined petroleum (2.7%) in exports. Kazakhstan's imports are not as concentrated in a single category, its main imports are machines (26%), metals (11%), chemical products (11%), mineral products (9%) and transportation (8.8%). Kazakhstan's trade by value declined between 2012 and 2016 in line with commodity price fluctuations, but recovered slightly in 2017.

Investment climate

Kazakhstan's investment climate is relatively strong to attract foreign investment. It receives the vast majority of foreign direct investment (FDI) in Central Asia, at over 71% of the regional total (UNECE, 2019^[5]). Kazakhstan is the only country in the region whose bonds have received investment-grade credit ratings from the top agencies. The Netherlands is Kazakhstan's most important investor, contributing 29% of Kazakhstan's FDI, followed by the United States (18%), Switzerland (14%), the Russian Federation (6%) and China (5%) (see Figure 4.2).

Figure 4.2. FDI in Kazakhstan by source country, 2018



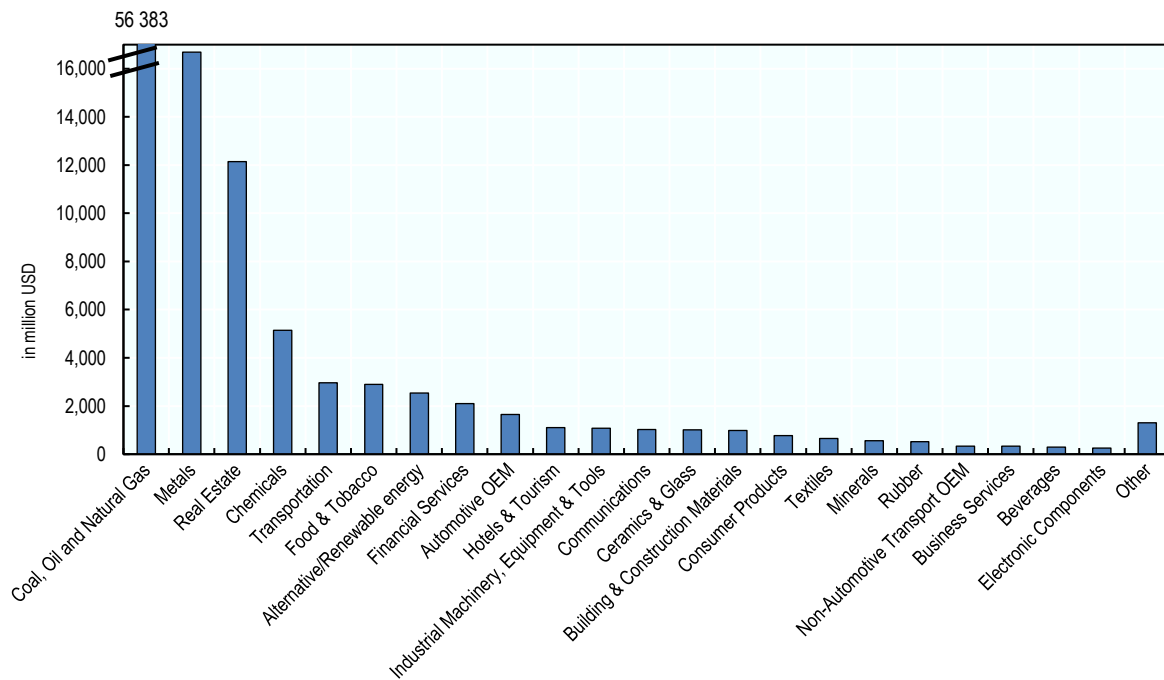
Source: National Bank of Kazakhstan (2018^[6]), *Валовый приток иностранных прямых инвестиций в Республику Казахстан от иностранных прямых инвесторов по странам* [Gross inflow of foreign direct investment to the Republic of Kazakhstan from foreign direct investors by country], National Bank of Kazakhstan, <https://nationalbank.kz/?docid=680&switch=rus>

Similarly to other countries in the region, foreign investors have mostly been interested in Kazakhstan's mineral resource wealth, with the majority of investment going towards coal,

oil and natural gas industries (49.5%), and the metal industry (14.6%). Meanwhile, infrastructure related industries such as transportation (2.6%) and renewable energy (2.2%) receive a smaller share of foreign direct investment (see Figure 4.3)

Figure 4.3. Greenfield FDI in Kazakhstan by economic activity, 2003-2017

Cumulated greenfield FDI capital between January 2003 and September 2017 in USD million



Note: Other includes Software & IT services; Plastics; Healthcare; Leisure & Entertainment; Aerospace; Pharmaceuticals; Paper, Printing & Packaging; Engines & Turbines; Medical Devices; Consumer Electronics Business Machines & Equipment; Semiconductors; Warehousing & Storage; Automotive Components; Wood Products.

Source: OECD based on fDi Markets (2019^[7]), *fDi Markets: the in-depth crossborder investment monitor (database)*, fDi Markets, <https://www.fdimarkets.com/>

The government has made improving Kazakhstan's investment climate and business environment a national priority, and its recent reforms have brought it closer to international standards on a number of metrics. For instance, Kazakhstan has removed foreign equity restrictions in air transport and fixed-line telecommunications, clearing the path for foreign ownership of firms. It has also become easier to hire foreign nationals in recent years, especially in the lead-up to Kazakhstan's admission to the World Trade Organisation in 2015. The government has also sought to improve the protection of foreign investments and provide effective dispute resolution mechanisms. Its simplified procedures relating to licencing and setting up a business have led to improved rankings in the World Bank's annual Doing Business report: Kazakhstan was 35th out of 190 countries in 2016 compared to 51st just one year before (IBRD, 2019^[8]). Recent legislative changes, including a new public private partnership law and improved concession legislation, are expected to boost investment in infrastructure development.

However, Kazakhstan still needs to implement governance reforms, particularly on transparency and accountability mechanisms. Policies supporting entrepreneurship, small

and medium enterprises (SMEs) and skills development are also insufficient, as shown by the SME sector's persistently modest share of the economy (OECD, 2018^[9]). Kazakhstan's legislative and regulatory frameworks still hamper efforts to attract FDI since they are not fully conducive to competition, and state monopolies still dominate certain parts of the energy sector (oil transport, electricity transmission) and the transport sector (ports, airports, railways). Unaddressed corruption and corporate governance shortcomings also continue to concern investors. Kazakhstan's efforts to improve the corporate responsibility of its businesses, including through awareness promotion of the OECD Guidelines for Multinational Enterprises, are key not only for an improved investment climate, but also for the promotion of firms that engage in sustainable business practices. Kazakhstan has made headway in improving the quality of investment in extractives and has expressed interest in improving procedures for taking environmental considerations into account, but human rights and labour relations remain difficult topics (OECD, 2017^[10]). However, Kazakhstan's updated Environmental Code, which would make the use of key tools for determining environmental consequences such as Environmental Impact Assessments (EIAs) and Strategic Environmental Assessments (SEAs) obligatory, is still awaiting adoption.

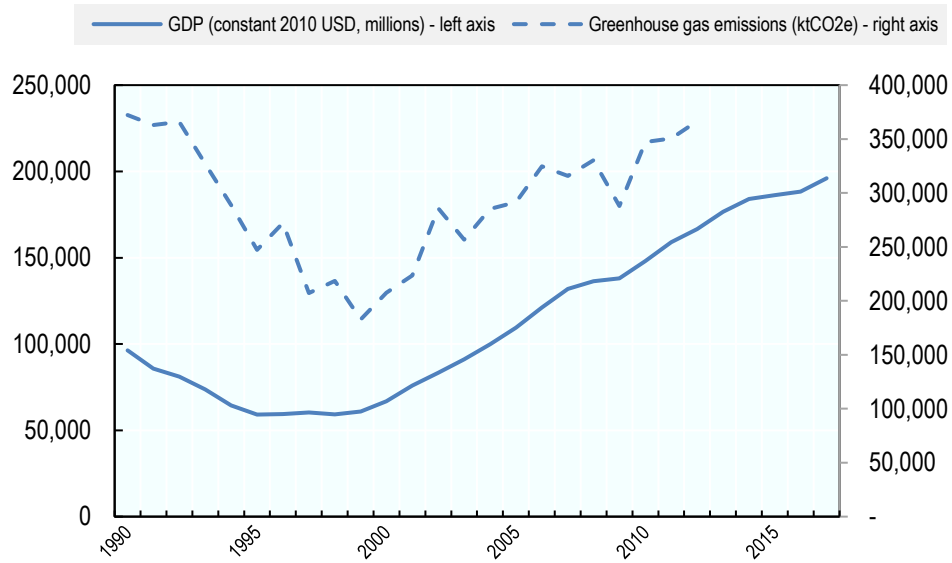
Unlike several other Central Asian countries, Kazakhstan's debt levels to external creditors are not considered risky and it maintains an investment-grade credit rating. Kazakhstan is a key participant in China's Belt and Road Initiative (BRI), but unlike many other participants, Kazakhstan has financed most of its BRI-related infrastructure projects with its own budget (Emerging Markets Forum, 2019^[11]). Kazakhstan has used BRI-linked Chinese finance as a complement to fit into its planning by linking it to its *Nurly Zhol* infrastructure development strategy (see section 4.3 for more information on Kazakhstan's strategic documents).

Climate change

Kazakhstan's total emissions only account for 0.68% of total global greenhouse gas emissions (World Bank, 2019^[1]). While Kazakhstan's greenhouse gas emissions dropped sharply following the breakup of the Soviet Union (by 50.9%), they have consistently risen since the early 2000s (see Figure 4.4). Kazakhstan is now on track to surpass their pre-independence peak, with greenhouse gas emissions only 1.6% smaller in 2012 compared to the levels in 1991. Over the same period, Kazakhstan's economy shrank by a third (1990-1995) and then steadily recovered, surpassing its 1990 by 2005 and, by 2017, doubling in size compared to 1990. As a result, the emissions intensity of Kazakhstan's economy decreased from 3.9 kgCO₂e per USD in 1990 to 2.2 kgCO₂e per USD in 2012 (World Bank, 2019^[1]). Over the same period, the country's per capita greenhouse gas emissions decreased from 22.8 tCO₂e in 1990 to 21.8 tCO₂e by 2012 (World Bank, 2019^[1]).

The energy sector is responsible for 78% of Kazakhstan's emissions, while agriculture and industrial processes account for much smaller shares at only 7% and 9% respectively (Government of Kazakhstan, 2017^[12]). Kazakhstan's reliance on coal contributes to its rapidly increasing greenhouse gas emissions and air pollution problems. Kazakhstan's agriculture and mining sectors are particularly vulnerable to the effects of climate change, as increasingly frequent hot weather and severe droughts threaten the availability of water (UNECE, 2019^[5]).

Figure 4.4. GHG emissions and GDP of Kazakhstan, 1990-2017



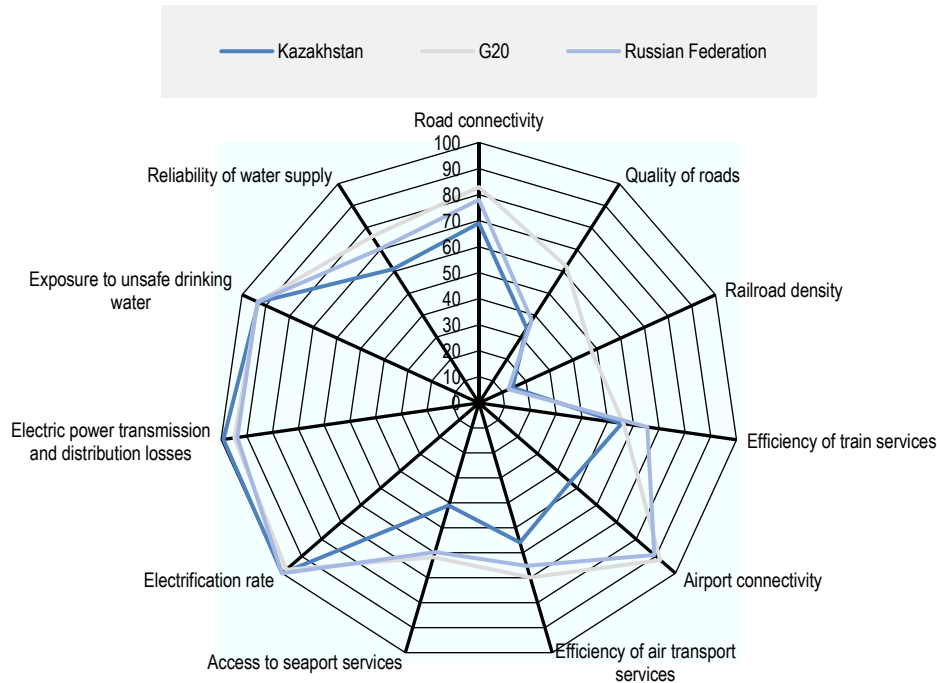
Source: World Bank (2019^[1]), *World Development Indicators (database)*, World Bank, <https://datacatalog.worldbank.org/dataset/world-development-indicators>

4.2. Kazakhstan's infrastructure needs and current plans

Compared to other countries in the region, Kazakhstan has relatively high-quality existing infrastructure (see Figure 4.5).

Figure 4.5. Quality of infrastructure in Kazakhstan

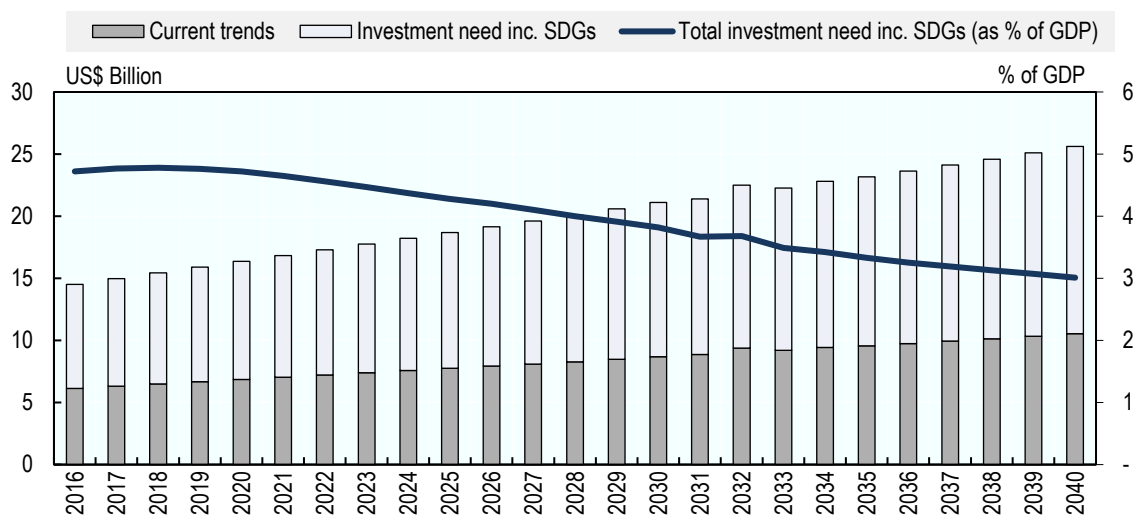
On a scale from 0 (worst) to 100 (best)



Source: World Economic Forum (2017^[13]), *The Global Competitiveness Report 2017-2018*, World Economic Forum, <http://www3.weforum.org/docs/GCR2017-2018/05FullReport/TheGlobalCompetitivenessReport2017%E2%80%932018.pdf>

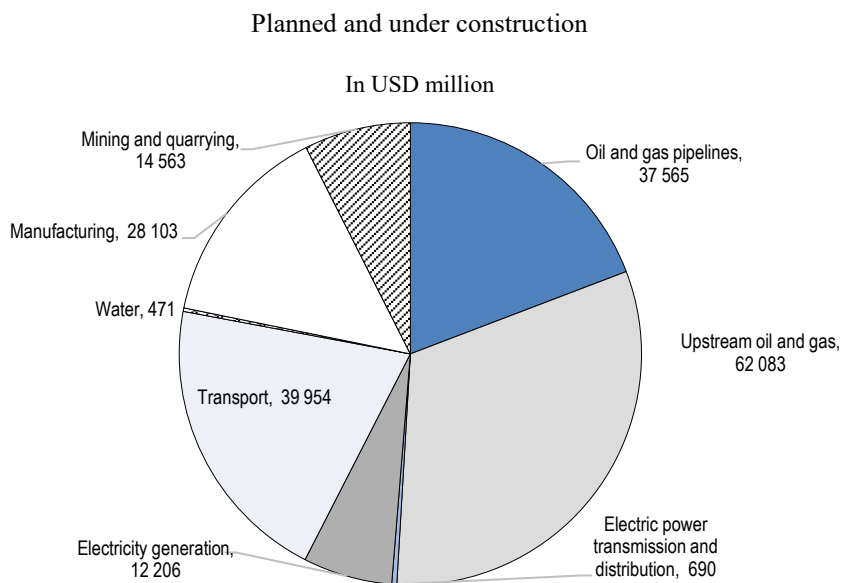
Kazakhstan's infrastructure needs are increasing in line with its expanding economy and growing population. Assuming its GDP grows at 4.3% per year, Kazakhstan will need to spend USD 292 billion (or 3.93% of GDP) on average in infrastructure until 2040 (see Figure 4.6). Compared to current levels of spending, this translates into an investment gap of USD 84 billion (1.11 % of GDP) across all sectors, but it is more prevalent in cross-border infrastructure, energy and road transport (Global Infrastructure Hub, n.d.^[14]). Not only is new infrastructure needed, but also proper maintenance and quality control of the existing assets is necessary. Approximately 75% of existing infrastructure requires replacement or rehabilitation (ADB, n.d.^[15]).

Figure 4.6. Infrastructure investment needs in Kazakhstan, 2016-2040



Source: Global Infrastructure Hub (n.d.^[14]), *Kazakhstan – Global Infrastructure Outlook*, Global Infrastructure Hub, <https://outlook.gihub.org/countries/Kazakhstan>

Figure 4.7. Infrastructure projects in Kazakhstan by sector



Notes: *Electricity generation* projects include natural gas-fired electric power plants, wind farms, solar plants, hydroelectric power plants, and coal-fired electric power plants. *Upstream oil and gas* projects include oil and gas field development projects. *Manufacturing projects* include petrochemical plants, cement plants, plants for the production of ferrosilicon, aluminium plants, polypropylene plants, metallurgical complexes, production of motor fuels, acid plants, steel plants, bioethanol plants.

Source: OECD analysis based on accessed databases as of June 2019.

Out of the 195.6 billion USD of investments tracked between 2000 and 2019, energy projects account for just over half of Kazakhstan’s planned and under construction infrastructure projects at around USD 112.5 billion USD (58%), while transport projects

make up 20%, manufacturing 14%, and mining and quarrying 7%. Water projects, which include both water supply projects as well as irrigation and water management are limited to only USD 471 million (see Figure 4.7).

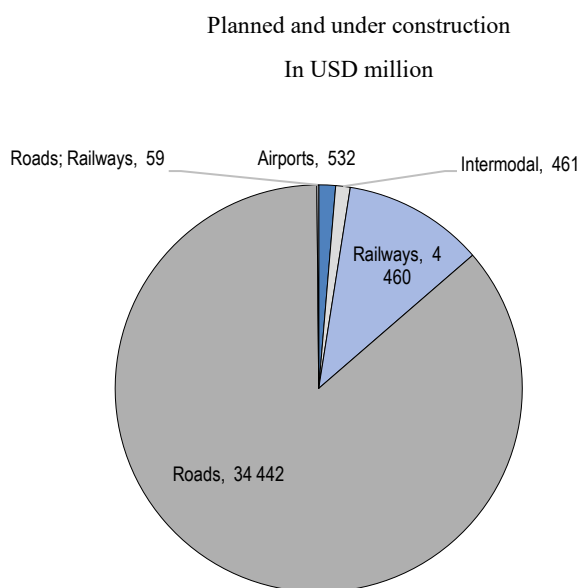
Transport

Kazakhstan's annual freight traffic exceeds 200 billion tonne-km, which accounts for more than 80% of regional¹ freight. Kazakhstan's strategic geographic position partially explains this concentration of freight traffic, since most goods bound for Central Asia from Europe and Asia need to pass through Kazakhstan. However, to maintain current network performance in terms of trade volume-capacity ratios, Kazakhstan's road capacity must reach 151% of today's levels by 2030 and 350% by 2050. For rail, Kazakhstan already has more than the required capacity for 2030, but needs to reach 138% of current levels by 2050 (ITF, 2019^[16]).

In the transport sector, Kazakhstan's planned infrastructure investments consist primarily of road projects, which account for 81% of investments (USD 34.4 billion). Rail accounts for a further 16%, while intermodal and air projects make up the remaining 2% and 1% respectively (see Figure 4.8). Both road and rail projects feature among the largest investments in the pipeline (see Table 4.2). Greenfield developments and refurbishments both figure among the largest road projects, while most large investments in rail are in modernisation of existing rail lines.

Among these projects, Kazakhstan's *Nurly Zhol* infrastructure development strategy explicitly names two – the Centre-East road corridor between Astana and Ust-Kamenogorsk (Öskemen) and the Centre-West corridor between Shalkar and Kandygash – as priorities. The Centre-West Corridor is expected to provide jobs and stimulate the development of small and medium enterprises. It will provide a main gateway to the west through the Caspian Sea and Caucasus to Europe, and to the Pacific port city of Lianyungang.

¹ Excluding Turkmenistan.

Figure 4.8. Transport projects in Kazakhstan by sub-sector

Notes: Intermodal projects include the creation of multimodal transportation hubs and logistics centres at dry ports.

Source: OECD analysis based on accessed databases as of June 2019.

In the road sector, the focus remains on the domestic road network, which comprises six international corridors with a total length of about 8 250 km that serve as international transit routes between China, the Kyrgyz Republic, Uzbekistan, Turkmenistan and the Russian Federation, onwards to Europe. Such projects are also part of international agreements, such as Central Asia Regional Economic Cooperation (CAREC) and the Transport Corridor Europe-Caucasus-Asia (TRACECA), however Kazakhstan has yet to fully exploit its strategic position to facilitate smooth trade across border and engage in regional and global value chains.

Kazakhstan seeks to assert itself as a regional transport hub, and given that four of CAREC's six corridors pass through its territory, it is strategically placed for such a role. The most important of these corridors are Corridor 1 – from China to the Russian Federation and Europe via the Kyrgyz Republic and Kazakhstan, and Corridor 2 – which runs from east to west between China and the Caucasus via the Kyrgyz Republic, Uzbekistan and Kazakhstan.

In the railway sector, Kazakhstan aims to improve express train services for both passenger and freight transportation between major cities, but more private investment is needed. Although there is some increasing evidence of private provision of transport and services, including through public-private partnerships (PPPs), it is currently very limited. Only recently, the Almaty Ring Road PPP is the first large project outside of the oil and gas sector financed with private capital (IFC, 2014_[17]).

Projects of this kind are vital for Kazakhstan to improve its infrastructure, in turn reducing transport costs which otherwise are very high. It costs around 177 USD for one tonne of goods to reach 20% of global GDP from Kazakhstan, meanwhile in Germany the same access can be achieved at a much smaller cost of approximately 30 USD (ITF, 2019_[16]).

Table 4.2. Hotspot projects in the transport sector in Kazakhstan

(a) Under construction					
Name	Sub-sector	Description	Project value (USD million)	Funding source	Type of investment
South West Roads: Western Europe-Western China International Transit Corridor (CAREC 1B & 6B)	Road	The project is a major corridor connecting Kazakhstan with China in the southeast, and to the border with Russia for a total of 2 787 km. It aims to improve Kazakhstan's transport efficiency, as well as road management and traffic safety.	4 250	IBRD	Brownfield
East-West Roads Project (Almaty-Korgos Section): Western Europe - Western China International Transit Corridor (CAREC - 1b)	Road	The project connects Kazakhstan's Khorgos Dry port with its Chinese counterpart Horgos via an ultra-modern 4-lane highway.	2 136	IBRD	Greenfield
Astana Light Rail	Rail	The project will connect key locations in Astana and will terminate at Astana Nurly Zhol railway station. It is part of Nurly Zhol and linked to China's Belt and Road Initiative.	1 800	CDB; Government	Greenfield
Centre-East, Astana – Ust-Kamenogorsk	Road	The project covers the reconstruction of a 932-km roadway between Center-East, Astana-Ust-Kamenogorsk.	949	Government	Brownfield
Almaty – Ust-Kamenogorsk	Road	The project entails the reconstruction of the road Almaty-Ust-Kamenogorsk (851 km), which is considered of national importance.	655	Project finance	Brownfield
(b) Planned					
Name	Sub-sector	Description	Project value (USD million)	Funding source	Type of investment
Railway Modernisation Improvement Project	Rail	The project is part of the ADB's Country Operations Business Plan for Kazakhstan 2019-2021 and it is planned for 2021.	1 000	ADB	Brownfield
Centre–West Road Corridor (Shalkar–Kandyagash)	Road	The project is a road link connecting the centre with the west of Kazakhstan, and the main gateway to the west to Europe, and to the east to China (central to BRI and Nurly Zhol)	1 000	Government, ADB	Greenfield
Road development project (Kyzylorda – Zhezkazgan)	Road	The project is part of the ADB's Country Operations Business Plan for Kazakhstan 2019-2021 and it is planned for 2021.	1 000	ADB	N/A
Almaty-Aktogay Rail Electrification	Rail	The project was announced in 2008 and construction is expected to start in 2020.	984	N/A	Brownfield
Almaty Ring Road PPP, Kazakhstan	Road	The project is a key link in the Western China – Western Europe transnational highway. It is also the first large-scale, capital-intensive, privately financed infrastructure project outside of the oil and gas sector.	740	IFIs	Greenfield

Note: Refer to the Preamble for the present report's definition of 'hotspot' and other information on how the projects above were selected and prioritised. ADB = Asian Development Bank; CDB = China Development Bank; IBRD = International Bank for Reconstruction and Development.

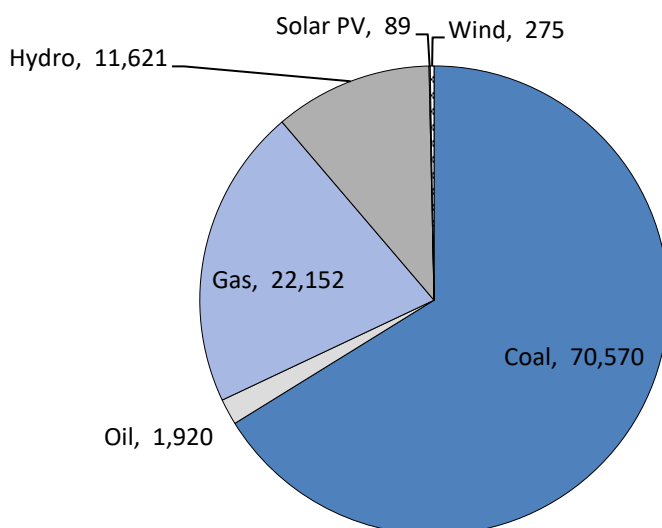
Source: OECD analysis based on accessed data from ADB (2019^[18]), IJGlobal (2019^[19]), CSIS (2019^[20]), Dealogic (2019^[21]), World Bank (2019^[22]) as of June 2019.

Energy

In the energy sector, the entire population has access to electricity, and its electric power transmission and distribution systems are relatively better than other countries in the

region, leading to losses of only 4.9% of generated electricity compared to 17.1% in Tajikistan and 19.7% in the Kyrgyz Republic (World Economic Forum, 2017^[13]). With its large reserves of hydrocarbons and robust oil and gas industries, Kazakhstan does not face the same energy security and self-sufficiency concerns as its neighbours. It is a net exporter of coal (11.77 Mtoe in 2017), oil (64.6 Mt in 2016) and natural gas (6.43 Mtoe in 2017). Its electricity exports and imports are approximately balanced: Kazakhstan exported as much as it imported in 2015, whereas its net exports equalled 0.11 Mtoe in 2016 (IEA, 2018^[23]). Coal-fired power plants (primarily using low-quality coal with a high ash content) generate two-thirds of Kazakhstan's electricity, with the remaining third derived from natural gas (21%), hydro (11%) and oil (2%) (see Figure 4.9). Renewable sources jointly account for less than 1% of electricity generation, with 275 GWh of wind power and 89 GWh solar photovoltaic.

Figure 4.9. Electricity generation by fuel (GWh, 2016)



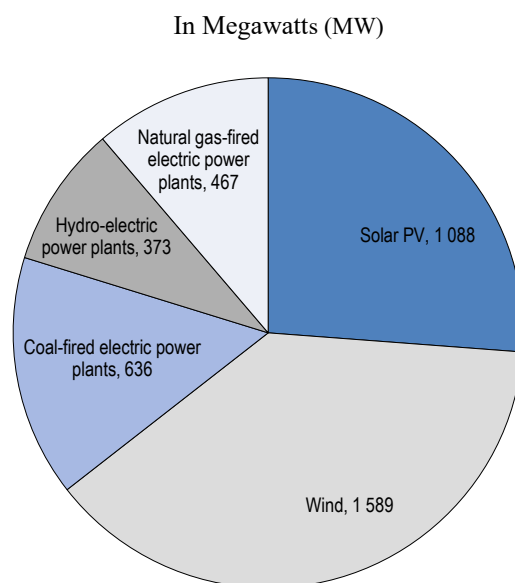
Source: International Energy Agency (2018^[23]), *IEA World Energy Balances 2018*, International Energy Agency, <https://webstore.iea.org/world-energy-balances-2018>

In terms of investment projects in electricity generation under construction and planned, Figure 4.10 shows that 38% of the investments by capacity are in wind power plants (or 1 589 MW), followed by solar PV with 26% (or 1 088 MW) and coal-fired plants with 15% (636 MW). Natural gas-fired electric power plants and hydro-electric power plants account for 11 and 9% respectively of planned investment projects in electricity generation. Most of Kazakhstan's hotspot energy projects link to the upstream oil and gas industry and distribution networks (Table 4.3).

One of the country's largest projects currently under construction is the Central Asia–China Gas Pipeline (Kazakhstan section), which is expected to be the largest gas transmission system in Central Asia. It will have significant implications on Kazakhstan's energy security. In the oil industry, the expansion of the Tengiz oil field will increase existing production capacity by 43% (NS Energy, n.d.^[24]). The overwhelming dominance of the oil and gas industry in the energy sector's planned infrastructure projects is in line with

Kazakhstan's historical reliance on its hydrocarbon reserves. However, evidence of continued oil-based development contradicts the country's economic diversification goals as expressed in Kazakhstan's strategic documents, including the country's energy diversification and green transition goals outlined in the *Concept for a Transition towards a Green Economy*.

Figure 4.10. Planned electricity generation projects in Kazakhstan, by fuel



Source: OECD analysis based on accessed databases as of June 2019.

Table 4.3. Hotspot projects in the energy sector in Kazakhstan

(a) Under construction					
Name	Sub-sector	Description	Project value (USD million)	Funding sources	Type of investment
Kurmangazy Oil Field Project	Upstream oil and gas	The project is an offshore oil field located in the Kazakh section of the Caspian Sea between Russia and Kazakhstan. With estimated reserves of 1.1 to 1.6 billion cubic metres, the project is considered the third largest oil field of Kazakhstan. Construction of the project resumed in late 2018.	23 000	Rosneft-Kazakhstan Ltd (Russia) and KazMunayGaz (Kazakhstan)	Greenfield
Tengiz Oilfield Production Expansion Project (FGP-WPMP)	Upstream oil and gas	The project is located in northwestern Kazakhstan covering 2 500 km ² . As one of the world's deepest oilfields, the project will increase crude oil production by 260 000 barrels per day, bringing total production to about 1 million bpd.	16 125	Project finance	Brownfield
Central Asia Gas Pipeline (Kazakhstan Section)		The project is the largest gas transmission system in Central Asia running from Turkmenistan to China through Uzbekistan and Kazakhstan.	7 500	CNPC; Türkmengaz; Uzbekneftegas; KazMunayGas	Greenfield

	Oil and gas pipeline	Currently, there are three lines of 1 830 km from Turkmenistan to China through Uzbekistan and Kazakhstan. A fourth line (D) of around 1 000 km is expected to be completed in 2020.			
Northern Route Pipeline to Novorossiysk	Oil and gas pipeline	The USD 2.6 billion project entails the construction of an oil pipeline that runs from the Tengiz oilfield in Kazakhstan across the Caspian Sea to Novorossiysk.	2 600	N/A	Greenfield
Ekibastuzskaya GRES-2 Expansion Power Plant	Coal-fired power plant	The project entails the construction of a third 636 MW unit at the Ekibastuz GRES-2 Power Station, a coal-fired power plant, which already has a capacity of 1 000 MW. Overall, the project generates 12% of all Kazakhstan's electricity with about 75% of energy produced being exported to Russia. The new unit is expected to be completed by 2024.	1 200	EDB, Vnesheconombank and CDB	Greenfield
(b) Planned					
Name	Sub-sector	Description	Project value (USD million)	Funding	Type of investment
Kashagan Oil Field Development	Upstream oil and gas	The Kashagan Oil Field is located 80 km southeast of Atyrau in the Kazakh Caspian sea territory. The oil field is estimated to hold up to 38 billion barrels of oil, with other estimates suggesting reserves of 50 billion barrels, which would make it the second largest oil field in the world. Appraisal drilling has already been successfully carried out with production estimated at 20 000 barrels per day of 42-45 degree API oil.	15 000	Agip Azerbaijan BV, British Gas PLC, ExxonMobil Canada Ltd, Royal Dutch/Shell Group, TotalFinaElf, Indonesia Petroleum Ltd, ConocoPhillips (UK) Ltd, Natl Co Kazmunaygaz JSC	Greenfield
Balkhash Coal Fired Power Plant	Coal-fired electric power plants	The Balkhash Coal Fired Power Plant will consist of two 660 MW units producing 9 209 billion kilowatt hours of electricity annually, which will account for an estimated 9% of Kazakhstan's power output. The plant will be situated on the southwest bank of Lake Balkhash and will be supplied with coal from Ekibastuz coal basin.	4 500	KEPCO, Samsung C&T Corp, Samruk Holdings JSC	Greenfield
Beineu Bozoi Shymkent Pipeline	Oil and gas pipeline	This project involves the development of an oil and gas pipeline that connects all of Kazakhstan's existing pipelines, creating a single oil and gas transportation system spanning 1 477 km. This pipeline will eliminate Kazakhstan's dependence on any imported gas.	2 500	KazTransGaz, Trans-Asia Gas Pipeline Company Ltd.	Brownfield
Eskene-Kuryk Oil Pipeline	Oil and gas pipeline	The Eskene-Kuryk Oil Pipeline will have a capacity of 600 000 barrels per day. The pipeline will originate in Eskene, located in the Atyrau region, and terminate at an oil terminal in Kuryk port on the Caspian coast. The	1 500	KazTransOil	Greenfield

project was announced in 2008 and is expected to be completed in 2023.

Note: Refer to the Preamble for the present report's definition of 'hotspot' and other information on how the projects above were selected and prioritised. CDB = China Development Bank; CNPC = China National Petroleum Corporation; EDB = Eurasian Development Bank

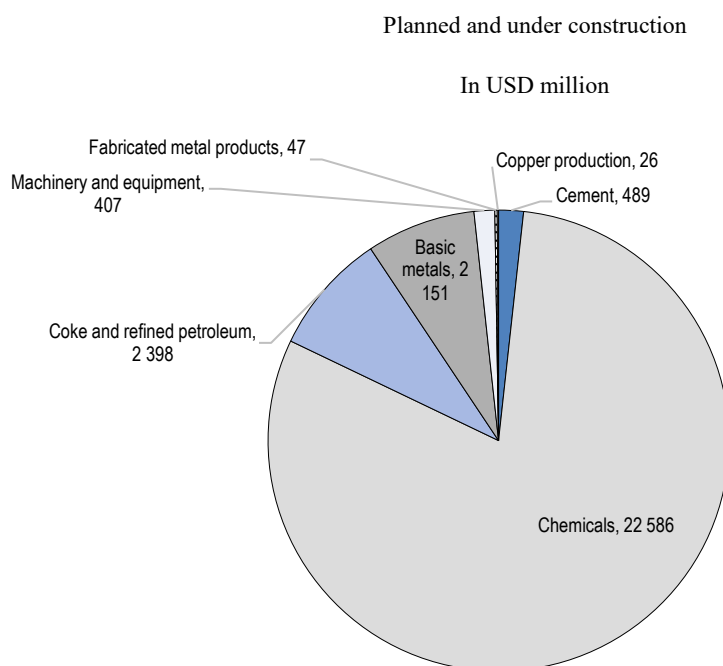
Source: Oil and Gas Journal (2005^[25]), SourceWatch (2017^[26]); ADB (2019^[18]), IJGlobal (2019^[19]), CSIS (2019^[20]), Dealogic (2019^[21]), World Bank (2019^[22]) as of June 2019.

Industry and mining

The industry sector's infrastructure pipeline is about two-thirds manufacturing projects (64%, see Figure 4.11) and one-third mining and quarrying (36%, see Figure 4.12). This is not in line with Kazakhstan's stated priority of economic diversification (see section 4.3 for more information on Kazakhstan's strategic documents).

Most of the manufacturing projects are in petrochemical production or mining (see Table 4.4) and target China and the Russian Federation as export markets. For example, a significant project under construction is the Tymlai Mining, Chemical and Metallurgical Complex, a USD 5 billion mining and processing plant at the Tymlai ore field and a chemical metallurgical plant in the special economic zone (SEZ) of Pavlodar. The plant is of strategic importance to supply raw materials for industries using steel and titanium dioxide. Another significant project that is planned is the production of the base oil production plant in Turkestan Oblast, which will produce 183 000 tonnes of export base oil annually for export.

Given the preponderance of mining and petrochemicals among Kazakhstan's planned projects, current investment plans are not in line with national government's long-term developmental aspirations for a competitive economy, which aims at moving towards higher value-added manufacturing. According to the ADB, only around 7.8% of Kazakhstan's exports is made up of foreign inputs. Compared to a neighbouring hydrocarbon exporter, the Russian Federation, Kazakhstan displays low level of integration in international production networks, and there is significant scope to better integrate Kazakhstan's economy into global value chains (GVCs) (ADB, 2018^[27]).

Figure 4.11. Industrial projects in Kazakhstan by sub-sector

Note: Chemicals projects include phosphate fertiliser plants, petrochemical production plants, gas chemical complexes, sulphuric acid plants, dry cyanide sodium production. *Coke and refined petroleum* projects include the construction of base-oil production plants, extraction and processing of coking coal, and construction of a liquefied natural gas plant. *Basic metals* projects includes the construction of hydrometallurgical plants, ferroalloy plants, iron ore projects, plants for production of primary aluminium. *Fabricated metal products* include plants for the production of welded pipes and production of metal powder

Source: OECD analysis based on accessed databases as of June 2019.

Table 4.4. Hotspot projects in the industry and mining sector in Kazakhstan

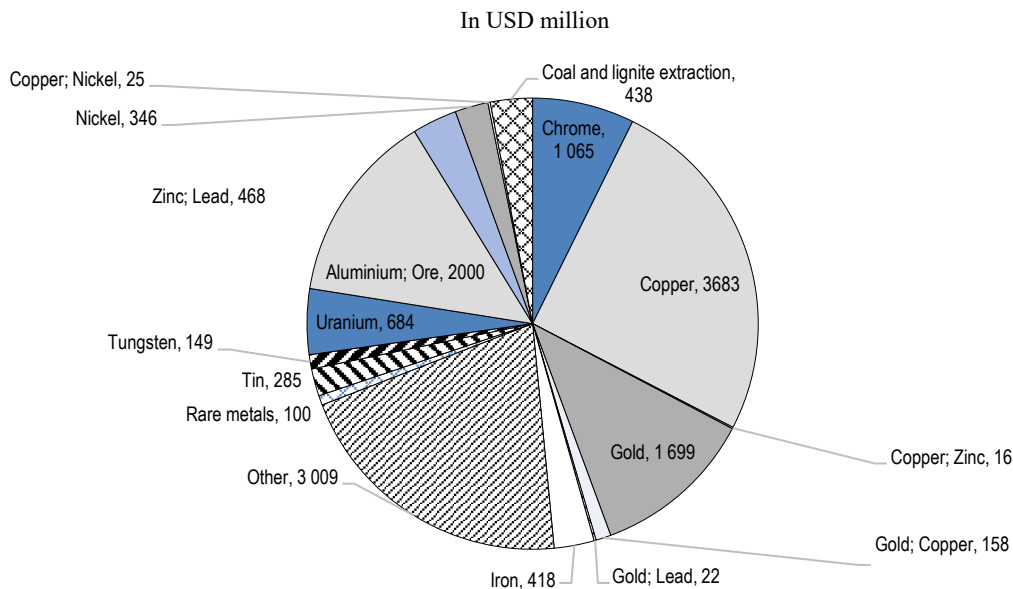
(a) Under construction					
Name	Sub-sector	Description	Project value (USD million)	Funding source	Type of investment
Kazakhstan Petrochemical Complex	Chemicals	The first stage of the project consists in the construction of a polypropylene production facility. As part of the second stage, a polyethylene plant will be built.	5 000	DBK; Eximbank of China	Greenfield
Construction of Aktogay mining and processing plant in the East Kazakhstan region	Copper	It is a sulphide ore processing plant as part of the construction of the Aktogay mining and processing enterprise in the East Kazakhstan region.	2 200	Eximbank of China	N/A
Atyrau Petrochemical Complex Development	Chemicals	Part of Government's initiative to develop to country's petrochemical industry.	2 000	Eximbank of China, KazMunayGaz, Sat & Company	Greenfield

ENRC iron ore project	Iron	Financed by China's Development Bank as part of a 2 billion USD loan to the Samruk-Kazyna Fund.	1 600	CDB	N/A
Construction of Polypropylene Plant in Atyrau	Chemicals	Financed by China's Exim Bank and the Kazakhstan Development Bank to build a gas chemicals plant near Atyrau.	1 380	DBK; Eximbank of China	Greenfield
(b) Planned					
Name	Sub-sector	Description	Project value (USD million)	Funding source	Type of investment
Construction of Tymbai Mining, Chemical and Metallurgical Complex	Multiple	The project is of strategic importance to supply raw materials for industries using steel and titanium dioxide.	2 590	N/A	Greenfield
Construction of gas chemical complex on the Karachaganak field	Chemicals	The chemical complex will process separated and stabilized gases containing acid gas.	1 700	N/A	Greenfield
Construction of the base oil production plant in Turkestan Oblast	Refined petroleum	The project is expected to help Kazakhstan export base oil to foreign markets such as China by reaching a volume of exports around 183 000 tonnes per year.	729	N/A	Greenfield
Steel production at the Velikhovskoye deposit in Aktobe Oblast	Base metal	The project is expected to increase supply of products to Russia and China.	550	N/A	Greenfield
Extraction and processing of coking coal from Samarskoye deposit	Coking coal	The project is expected to supply the industrial sector's increasing demand for quality raw materials for the production of coke.	438	N/A	Greenfield

Note: Refer to the Preamble for the present report's definition of 'hotspot' and other information on how the projects above were selected and prioritised. CDB = China Development Bank; DBK = Development Bank of Kazakhstan

Source: OECD analysis based on accessed data from ADB (2019^[18]), IJGlobal (2019^[19]), CSIS (2019^[20]), Dealogic (2019^[21]), World Bank (2019^[22]), and Kazakh Invest National Company (2019^[28]) as of June 2019.

Figure 4.12. Mining projects in Kazakhstan, by mineral



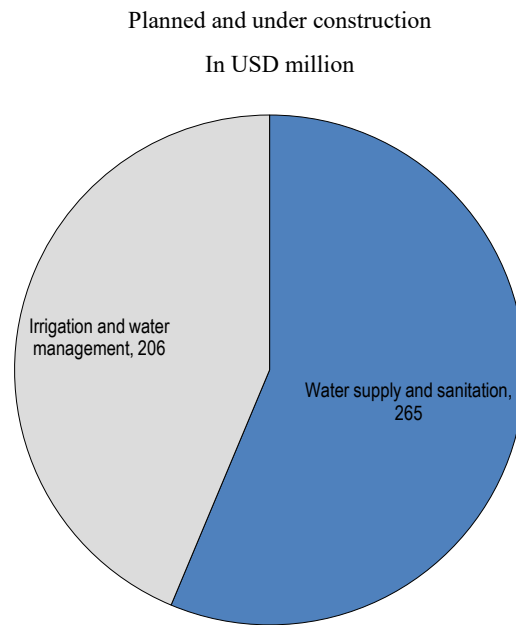
Source: OECD analysis based on accessed databases as of June 2019.

Water

Kazakhstan's population is the least exposed to unsafe drinking water in the region at 8.8%, compared to 13.3% in the Kyrgyz Republic and 12.4% in Tajikistan. Kazakhstan's water supply is slightly more reliable than Tajikistan's (rated 61 out of 100 compared to 60.4) and considerably more reliable than the Kyrgyz Republic's or Mongolia's (rated 52.5 and 52.4 respectively). However, it is less reliable than in Azerbaijan and Georgia, whose water supply systems are rated 65.7 and 67.5 respectively (World Economic Forum, 2017^[13]).

Kazakhstan seeks to further improve its water supply systems and therefore has numerous under construction and planned water projects which are estimated to be worth USD 471.1 million. Out of the large volume of projects 56.3% of them will focus specifically on developing Kazakhstan's water supply and sanitation. The remaining 43.7% of projects aim to aid with the progression of irrigation and water management in the country (see Figure 4.13).

These projects are reflected in Kazakhstan's development strategies, for example *Kazakhstan-2050* and the *Concept for the Transition towards a Green Economy* aim to solve problems associated with water supply and irrigation water, in order to increase Kazakhstan's water security. More specific strategies such as the *State Programme on Development of the Agro-Industrial Complex for the period 2017-2021* intend to increase water recycling and recirculation in the industrial sector as well as decreasing overall water use by 2021 (see Table 4.5).

Figure 4.13. Water projects in Kazakhstan by sub-sector

Source: OECD analysis based on accessed databases as of June 2019.

4.3. Strengths and weaknesses of existing institutional set-up for sustainable infrastructure planning

Strategic planning and links between long-term goals, infrastructure plans and environmental considerations

Kazakhstan's government has established long-term development strategies such as *Kazakhstan-2050* and *Concept for the Transition towards a Green Economy* (which contains goals to 2020, 2030 and 2050) (see Table 4.5). These strategies define quantitative objectives, with a focus on growth and economic diversification away from Kazakhstan's historical reliance on extractive industries. Kazakhstan's ambition, however, has not translated into actions on the same scale as its goals. For example, the Concept's goal to increase the share of wind and solar in electricity generation to 3% by 2020 will clearly not be met, since these sources still account for far less than 1% of electricity generation today. Similarly, the Concept's goal of decreasing CO₂ emissions in the energy sector to 2012 levels by 2020 looks unlikely, with 2016 levels 10% higher than in 2012 and trending upwards.

A significant gap exists between goals and efforts made to achieve them, and directing more resources to screening mechanisms that would ensure that project-level infrastructure investment decisions contribute to long-term development and climate objectives would allow Kazakhstan to achieve its stated ambitions. Project-level screening mechanisms should also be complemented with systems-level planning for infrastructure planning, to ensure that infrastructure investment decisions align with national sustainable development plans.

Kazakhstan's existing legislation clearly defines a three-tier system of strategic planning documents. Long-term national development strategies like *Kazakhstan-2050* occupy the top tier, and its objectives are cascaded through lower-tier mid-term strategies (*Strategic Development Plan to 2025*), five-year programmes, sectoral strategies and subnational development plans. The clarity and simplicity of the system ease communication of government priorities to both citizens and investors.

Kazakhstan's primary infrastructure development strategy, *Nurly Zhol*, its *State Programme for Industrial-Innovative Development 2015-2019* and the *Concept for the Transition towards a Green Economy 2013-2020* define budgets for their implementation. *Nurly Zhol* includes a list of projects and policies along with estimated funds required, the State Programme defines an annual budget for the programme and the Concept estimates the cost of measures it includes.

Despite the advanced development of its strategic planning system, Kazakhstan does not yet legally require strategic environmental assessments (SEAs) of strategies' potential impacts. The government should develop legislation in line with the UNECE Protocol on Strategic Environmental Assessment to the Espoo Convention. Kazakhstan, with the help of UNECE, began work on legislation related to SEA in its new Environmental Code in 2018, but it has not yet been adopted.

This shift to increasing environmental considerations within Kazakhstan's government could potentially begin by evaluating the implementation of the *Concept for the Transition to a Green Economy*, as its first phase of targets end in 2020, which provides an excellent opportunity to reassess and revise the Concept. The government is currently preparing the revised draft, which is supposed to include Kazakhstan's commitments under the Paris Agreement, the Sustainable Development Goals (SDGs) and the OECD Green Growth

Declaration. The government could consider seizing the opportunity to integrate all of its environment- and climate-related strategic documents into the revised Concept to produce a single, comprehensive strategy.

Institutional set-up and decision making processes

The institutional capacity of Kazakhstan's government bodies is greater than in neighbouring countries, but better coordination mechanisms are necessary to create an integrated infrastructure planning system that could screen and prioritise infrastructure projects according to long-term development and climate goals. The adoption of the new Environmental Code making EIAs and SEAs mandatory could be a first step towards such a system.

Until recently, the institutional set-up of Kazakhstan's government lacked robust impartial state bodies on environment and water. The ministries currently responsible for Kazakhstan's environmental protection and water policies were the Ministry of Energy and the Ministry of Agriculture respectively, where they faced strong competing interests from powerful industries in the energy and agriculture sectors.

In June 2019, Kazakhstan underwent several institutional reconfigurations, one of which was the creation of a new Ministry of Ecology, Geology and Natural Resources comprising the environment- and water-related divisions formerly housed in the Ministry of Energy and the Ministry of Agriculture. It is also responsible for the mining sector, a portfolio formerly held by the Ministry of Industry and Infrastructure Development (The Astana Times, 2019^[29]). This new independent institution could provide an opportunity to better mainstream environmental concerns into mining and energy decisions (Zakon.kz, 2019^[30]).

List of relevant strategic documents

Table 4.5. Main strategic documents in force

	Status	Time Horizon	Sectoral Coverage	Main objectives
First Nationally Determined Contribution (NDC)	Submitted in 2016	2016-2030	Economy-wide	<ul style="list-style-type: none"> • Unconditional Target: 15% reduction in greenhouse gas emissions by 31 December 2030, compared to 1990. • Conditional Target: 25% reduction in greenhouse gas emissions by 31 December 2030, compared to 1990 • Main sectors targeted for emission reduction: Energy sector (transition to renewable energy sources), Transport sector (aim to achieve a sustainable transport system) • Main adaptation tool: Concept on Transition to Green Economy, and other national strategies listed below
"Kazakhstan-2050"	Adopted in 2012	2012-2050	Governance, planning, economy, energy, water	<ul style="list-style-type: none"> • Create a favourable investment climate to boost economic capacity • Formulates target to become one of the 30 most developed countries by 2050 • Target to increase its share in alternative and renewable energy sources in total energy consumption by 50% by 2050 • Solve problems associated with water supply by 2020 and irrigation water by 2040
Strategic Plan for Development until 2025	Adopted in 2018	2018-2025	Governance, planning, economy, energy, water, industry	<ul style="list-style-type: none"> • Achieve commitments under the Paris Agreement • Consideration of green financing and investment, as well as promoting investment in green technology • Decarbonisation of the economy

				<ul style="list-style-type: none"> • Increased efficiency in the use and protection of water resources • Development of renewable energy sources and conventional energy sources • Development of low waste economy and waste management • Conservation of biodiversity
Concept on Transition to Green Economy	Adopted in 2013	2013-2020	Governance, economy, water	<ul style="list-style-type: none"> • Raise efficiency of the use of resources and resource management • Modernise existing infrastructure and construct new infrastructure • Increase the well-being of the population and the quality of the environment • Increase water security
“Nurly Zhol” for the period 2015-2019	Adopted in 2015	2015-2019	Transport, industry, energy, education, housing, tourism	<ul style="list-style-type: none"> • Develop infrastructure in various sectors • Promote creation of transport corridors (e.g. China-Kazakhstan-West Asia corridor) • Stimulate trade
State Programme of Industrial and Innovative Development for the period 2015-2019	Adopted in 2014	2015-2019	Industry	<ul style="list-style-type: none"> • Increase environmental requirements for the metallurgic industry
Concept for Development of the Fuel and Energy Sector until 2030	Adopted in 2014	2014-2030	Energy, industry	<ul style="list-style-type: none"> • Increase energy security • Modernisation of existing infrastructure and building new energy generation capacities • Development of internal markets and competition • Introduce modern technology to increase energy efficiency • Target to decrease energy intensity of GDP by 25% in 2020 from the 2008 level
State Programme on Development of the Agro-Industrial Complex for the period 2017-2021	Adopted in 2017	2017-2021	Water, industry	<ul style="list-style-type: none"> • Target to increase water recycling in industry from 0.69 km³ in 2015 to 0.77 km³ in 2021 • Target to increase water recirculation in industry from 7.3 km³ in 2015 to 7.62 km³ in 2021 • Target to decrease water use for every 1 ha of irrigated land by 20% to the level of 2015
“Digital Kazakhstan”	Adopted in 2017	No defined timeframe	Water	<ul style="list-style-type: none"> • Support in building a unified state information system for environmental and natural resource monitoring • Introduce automatic monitoring of fisheries, biodiversity and water resources

Table 4.6. Other relevant documents

	Status	Time Horizon	Sectoral Coverage
Programme to Attract Investment: "National Investment Strategy"	Adopted in 2017	No defined timeframe	Multi-sector
Unified Programme for Support and Development of Business: "Roadmap for business 2020"	Adopted in 2015	2015-2020	Multi-sector
State Programme for Management of Water Resources	Adopted in 2014, invalidated in 2017	2014-2020	Water
"Zhasyl Damu"	Adopted in 2010, invalidated in 2014	2010-2014	Multi-sector
"Energy Saving-2020"	Adopted in 2013, invalidated in 2016	2013-2020	Energy
Programme for Modernisation of the Solid Waste Management System for the period 2014-2050	Adopted in 2014, invalidated in 2016	2014-2050	Industry
"Productivity 2020"	Adopted in 2011, invalidated in 2016	2011-2020	Industry

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