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

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

PRELIMINARY VERSION

Lead authors and key contacts:
Douglas HERRICK, Policy Analyst, douglas.herrick@oecd.org
Alin HORJ, Policy Analyst, alin.horj@oecd.org
Virginie MARCHAL, Senior Programme Manager, virginie.marchal@oecd.org
Kumi KITAMORI, Head of the Green Growth and Global Relation division, kumi.kitamori@oecd.org

JT03451558

This document, as well as any data and map included herein, are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.
Disclaimer

This report is the preliminary version of the report “Sustainable infrastructure development for a low-carbon transition in Central Asia and the Caucasus: Mapping of potentially high-impact infrastructure projects and needs assessment”, that benefited from financial support from the International Climate Initiative (IKI) and Switzerland. It was prepared to be presented and discussed at the OECD GREEN Action Task Force Annual Meeting, that takes place 30 September – 1 October 2019, Paris. It is still undergoing quality checks and will benefit from additional comments from GIZ and countries in the region before being finalised.

This project is part of the International Climate Initiative (IKI). The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) supports this initiative on the basis of a decision adopted by the German Bundestag.

This report has been compiled within the GIZ program “Capacity Development for climate policy in the countries of South East, Eastern Europe, the South Caucasus and Central Asia, Phase III”

As a service provider with worldwide operations in the fields of international cooperation for sustainable development and international education work, GIZ works together with its partners to develop effective solutions that offer people better prospects and sustainably improve their living conditions. GIZ is a public-benefit federal enterprise and supports the German Government and a host of public and private sector clients in a wide variety of areas, including economic development and employment promotion, energy and the environment, and peace and security.
Executive Summary

Most economies of Central Asia and the Caucasus have seen unprecedented growth over the past two decades, reaping benefits of market reforms and taking advantage of relatively high commodity prices in hydrocarbon and metals. As they are now looking at diversifying their economies and integrating to global value chains to protect themselves from commodity price volatility, their existing infrastructure underperforms in its role to support inclusive economic development and connectivity in the region after decades of underinvestment (see Figure 1).

The Asian Development Bank estimates investment needs of around USD 492 billion (or 565 billion including climate-related needs), or USD 33 billion annually until 2030. Transportation infrastructure requires the most investment: Countries in Central Asia are among the world’s least economically integrated due to low density of settlement and economic activity, infrastructure bottlenecks, ageing road and rail networks and long distances to major markets, as well as numerous regulatory and policy barriers to cross-border flows. As these economies continue with their policy reforms towards market-oriented diversification, the need for effective and high-value infrastructure remains important.

Figure 1. Quality of infrastructure in selected countries of Central Asia and the Caucasus


1 The report covers five former Soviet republics of Central Asia (Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan and Uzbekistan) plus Mongolia, Azerbaijan and Georgia.

In addition to infrastructure investment within individual countries, regional connectivity stands high on the economic development agendas of most of the emerging economies of Europe and Asia. There is a variety of initiatives and plans for enhancing connectivity and integration across Europe and Asia. These include the EU’s TRACECA initiative and China’s Belt and Road Initiative (BRI), as well as various projects sponsored by India, the Central Asian states and other actors to promote connectivity in the region, such as the International North–South Transport Corridor or the proposed CAREC Corridors supported by the Asian Development Bank. These initiatives represent an opportunity to promote infrastructure projects compatible with sustainable development goals, or could lock in carbon-intensive technology and unsustainable development patterns for decades to come.

Many of the infrastructure projects planned and under construction in the region do not yet fully support countries’ long-term development and climate objectives. Transport projects are well integrated into regional initiatives and could increase regional connectivity in the long-term, but their impact on domestic connectivity, local development, environment and well-being remains uncertain. In the energy and industry sectors, projects tend to perpetuate the status quo, increasing the region dependency on fossil fuel and mineral extraction and limiting economic diversification. In fossil-fuel exporter countries, investment in technologies compatible with long-term decarbonisation pathways (e.g. renewable energy) remains marginal. In countries mainly relying on hydroelectricity for power generation, planned investments tend to ingrain dependency on water resources further, despite the potential long-term threat that climate change poses to water systems in a region particularly vulnerable to climate impacts.

Mainstreaming climate and development considerations in infrastructure investment decisions and strategies is needed and requires action on multiple fronts, from upstream sustainable infrastructure planning to project prioritisation, financing and delivery. The following improvements in existing institutional set-ups and strategic documents could help countries improve consistency between their long-term development goals and current investment plans:

- Developing mid-century low-emission development strategies, as encouraged by the Paris Agreement, to evaluate current projects and mid-term strategies against long-term visions and goals;
- Improving coordination between ministries to develop integrated and cross-sectoral infrastructure strategies that account for the trade-offs and synergies between different SDGs;
- Integrating environmental and social impacts in infrastructure project evaluation and prioritisation, through the systematic use of Environmental Impact Assessment and the adoption and implementation of international standards for sustainable infrastructure (see Annex);
- Strengthening capacities related to the planning, screening, provision and operation of sustainable infrastructure projects, at all levels of governments.
Preamble

This report presents key findings from an analysis of the strengths and weaknesses of existing institutional frameworks for strategic planning of sustainable infrastructure in eight countries of Central Asia and the Caucasus (Azerbaijan, Georgia, Kazakhstan, the Kyrgyz Republic, Mongolia, Tajikistan, Turkmenistan and Uzbekistan). It also provides an inventory of infrastructure projects, both planned and under construction, in the region, with the objective of assessing the extent to which infrastructure plans are consistent with long-term development, climate and environmental objectives.

Chapter 1 provides an overview of the challenges and opportunities related to infrastructure investment in the region.

Chapters 2 to 9 present country profiles that consist of three components:

1. a rapid assessment of the challenges and opportunities related to investment, climate and infrastructure;
2. an analysis of hotspot infrastructure projects, which are defined as infrastructure projects (planned and under construction) with potentially high environmental, social and economic impacts;
3. an overview of strengths and shortcomings in the existing framework for strategic infrastructure planning.

Due to limited data availability, the data points for the eight countries included in the present study are not always comparable. The authors have included the most recent data points available and, as much as possible, have used the same sources for each sector. When possible, other data points were included from national statistics offices from the most recent year available.

Methodology: building the database of infrastructure projects

The analysis draws on a database of infrastructure projects compiled by the OECD. The database covers eight countries (Azerbaijan, Georgia, Kazakhstan, the Kyrgyz Republic, Mongolia, Tajikistan, Turkmenistan and Uzbekistan) and five sectors:

- **Transport** (including airports, roads, railways, multimodal transportation hubs, transportation and logistics centres).
- **Energy** (including projects related to electricity generation, electric power transmission and distribution, upstream oil and gas, oil and gas pipelines).
- **Industry** (including manufacturing projects related to iron and steel production, cement plants, petrochemical plants, fabricated metal products, coke and refined petroleum).
- **Mining and quarrying** (including of metal ores such as gold, chrome, copper, zinc, iron, tin, uranium).
- **Water** (including water supply, water facilities, irrigation and drainage projects, rehabilitation).

The database covers infrastructure projects planned, under construction or completed in the period 2000 to 2018, and draws on the following sources of information:
International financial institutions and national development banks web sites:
Asian Development Bank (ADB); Asian Infrastructure Investment Bank (AIIB); European Bank for Reconstruction and Development (EBRD); European Investment Bank (EIB); Black Sea Trade and Development Bank (BSTDB); China Export-Import Bank; Development Bank of Kazakhstan (DBK); International Monetary Fund (IMF); OPEC Fund for International Development (OFID); World Bank; Kreditanstalt für Wiederaufbau (KfW).

Investment promotion agencies: Mongolia Invest; Kazakh Invest; Invest in Uzbekistan; Invest in Tajikistan; Investment Promotion Agency under the Ministry of Economy of the Kyrgyz Republic; Invest in Georgia.

Commercial databases: Bloomberg New Energy Finance, Dealogic, IJGlobal, Thomson ONE.

Public Datasets: Centre for Strategic and International Studies – Reconnecting Asia; EaP Transport Database; AidData.

Other sources: Sourcewatch; Institute for Energy Economics and Financial Analysis (IEEFA); Emerging Markets Forum; DAC/OECD Credit Reporting Database; Georgia Co-Investment Fund; Central Asia Regional Economic Cooperation Program (CAREC); International Tax and Investment Center (ITIC).

Note that the infrastructure estimates based on this database are uncertain, as there is no official tracking or collection of infrastructure investments at the national nor subnational level. There is no systematic tracking of comprehensive and comparable country-level data on infrastructure investments. While commercial databases and websites provide interesting insights on current projects and investments, the analysis is not comprehensive and can bring some inaccuracies. Data should be interpreted as indicating general trends rather than exact investment volumes. Main sources of uncertainties come from the following methodological challenges:

Comparability of data between different sources of information: there are no harmonised definitions of sectors or project status (planned, under construction, on-hold) across databases.

Double counting projects and their values: individual infrastructure projects can have several entries in a given database, both due to multiple phases of construction and the fact that single cross-border project’s components were assigned to two or more countries’ inventories. The database was reviewed several times to eliminate multiple entries for individual infrastructure projects from different data sources, but some double counting may still persist.

Underestimate of some infrastructure projects (small scale, private sector led): the quantitative analysis in the present study is based on projects that represent more than USD 10 million. There could also be a significant data gap on the financing volume of infrastructure projects that are not backed by multilateral development banks, as data related to private investments tend to be confidential or only available through commercial databases.

Accuracy of project status: Certain projects may be miscategorised due to limited information available at the project level, particularly on their status. Databases are not updated in real time and infrastructure projects’ statuses regularly change. Projects were re-categorised when inaccuracies became apparent through comments from country representatives or press articles. The
project status categories represent the status reported in the database as of July 2019.

Methodology: Selection of “hotspot” projects

Hotspot projects refer to infrastructure projects with potentially high impact in terms of economic, environmental and social outcomes. Those projects were selected against four criteria:

- **Scale:** The volume of dollars invested in an infrastructure project provides a proxy for potential economic and social benefits – or risks – associated with a given project (job creation, FDI). The database only contains large-scale infrastructure projects, with a minimum value of USD 10 million.

- **Environmental impact:** This criterion captures the extent to which infrastructure investment contributes to environmental objectives of the country. Projects with a potential high environmental impact include:
  a. projects that have a negative environmental impact and are incompatible with a low-carbon future (e.g. coal-fired power plants);
  b. projects that have a positive environmental impact and help countries engage on a low-emission future (e.g. renewable energy);
  c. projects that could potentially have a very high impact on the environment given their scale and their impact on landscapes (e.g. large hydro projects, trains lines, roads).

- **Connectivity impact:** The region has considerable room for improvement on connectivity with the rest of the world. The extent to which a project contributes to improving regional and domestic connectivity and integration is a proxy for its potential economic benefits.

- **Project status:** Project status categories in the database are ‘planned’, ‘under construction’, ‘completed’ or ‘cancelled’. This criterion assigns more value to projects where the government still has an opportunity to influence or mitigate negative impacts of projects on future development through cancellations, careful assessments or redesigns. These categories are ‘planned’ and ‘under construction’. Based on the information available from different databases and development partners, the project status has been clustered into different categories.

Sustainable infrastructure standards

Annex 1 aims to raise awareness amongst policy-makers, infrastructure planners and decision-makers on the variety of tools and instruments available to help them better integrate the 2030 Agenda for Sustainable Development as well as climate and development goals into their strategic infrastructure planning and decision-making. It provides a list of selected international principles, standards and instruments applicable to sustainable infrastructure, with a specific focus on OECD standards and principles.

3 The database includes information on large-scale cross-border projects, which are defined as projects that are part of regional corridors or networks linking two or more countries in the region. Cross-border projects with components in two countries are assigned to both countries’ inventories (e.g. Uzbekistan-Kyrgyz Republic-China railroad is assigned both to the Kyrgyz Republic and Uzbekistan).
1. Sustainable infrastructure in Central Asia: challenges and opportunities

1.1. The infrastructure gap

*Poor quality infrastructure has hampered regional integration connectivity and economic development*

Despite increased levels of infrastructure investment in recent years, the infrastructure gap in Central Asia and Caucasus countries remains high, which impedes further development of trade and the economy. The region’s investment needs are 492 USD billion (6.8% of GDP) or an annual average of 33 USD billion between 2016-2030 (Table 1.1). The gap expands to 7.8% of GDP if climate change adjustments are taken into account (Fay et al., 2019[2]). In the 1990s and during most of the 2000s, infrastructure spending in Central Asia was typically under 0.5% of GDP which is significantly below international trends, especially for rapidly growing countries (Fay et al., 2019[2]). Current spending levels are at around 4% of GDP, and need to be scaled-up.

**Table 1.1. Estimated Infrastructure Needs by Region, 2016-2030 (USD billion in 2015 prices)**

<table>
<thead>
<tr>
<th>Region</th>
<th>Projected Annual GDP Growth</th>
<th>Baseline Estimates</th>
<th>Climate-adjusted Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Investment Needs</td>
<td>Annual Average</td>
<td>Investment Needs as % of GDP</td>
</tr>
<tr>
<td>Central Asia and Caucasus</td>
<td>3.1</td>
<td>492</td>
<td>33</td>
</tr>
<tr>
<td>East Asia</td>
<td>5.1</td>
<td>13 781</td>
<td>919</td>
</tr>
<tr>
<td>South Asia</td>
<td>6.5</td>
<td>5 447</td>
<td>365</td>
</tr>
<tr>
<td>Southeast Asia</td>
<td>5.1</td>
<td>2 759</td>
<td>184</td>
</tr>
<tr>
<td>The Pacific</td>
<td>3.1</td>
<td>42</td>
<td>2.8</td>
</tr>
<tr>
<td>Total Asia and the Pacific</td>
<td>5.3</td>
<td>22 551</td>
<td>1 503</td>
</tr>
</tbody>
</table>


Low levels of investments in infrastructure in Central Asia and the Caucasus region over an extended period have translated into limited regional integration and low participation in global value chains (GVCs). Intra-regional trade in Central Asia stands at 5% of total trade for oil exporters (ITF, 2019[4]) and 15% for oil importers in the region (Kunzel et al., 2019[5]), which remains very low by international standards and compares unfavourably to intra-Asia and intra-Europe exports, at 59% and 69% respectively (Sow, 2018[6]). Although trade openness has improved slightly in recent years, regional openness has generally been in decline due to the lack of infrastructure and the concentration of trade in a few products, but also the overall business climate...
and foreign exchange restrictions (Vera-Martin et al., 2019[7]). Such factors have also led to slower growth of participation in GVCs. The low participation in GVCs is more prominent among the oil exporters in the region as they mostly export raw materials such as fuels (UNESCAP, 2015[8]).

The increased trans-Eurasian overland transit, with over 6 000 trains carrying goods across the Eurasian continent since 2011, could be an important turning point for Central Asia and the Caucasus towards greater trade integration (AIIB, 2019[9]). Given that in recent years China has established itself as a more central player in the GVCs networks, and trade between China and Europe is currently averaging over USD 1 billion a day, opportunities exist for countries in sectors such as industrial and consumer goods, textiles, and machinery and equipment (Kunzel et al., 2019[5]). Trade openness and GVC participation, as well as export diversification and improved product quality could raise the income levels of countries in Central Asia and the Caucasus between 5-10 percentage points within the next five to 10 years (Kunzel et al., 2019[5]).

Overall, the connectivity of Central Asia and Caucasus countries depends on how well they are positioned in global logistics networks, infrastructure and services. Across the region, there is considerable scope to improve connectivity with the rest of the world. According to one measure of connectivity (defined in terms of access to global GDP), the connectivity gap of landlocked Central Asian countries is around 50% of that of Germany, which is one of the best performers, while the Caucasus fares marginally better (see Figure 1.1). Such a low level of connectivity is partly caused by long distance of these countries to global economic centres as well as the lack of effective and low-cost maritime connections (ITF, 2019[4]).

Central Asian countries are relative outliers in terms of their logistics performance compared to other peers, leading to limited participation in regional and global value chains (see Figure 1.2). The cost of shipping a container via an overland route via Kazakhstan is over 8 000 USD per twenty-foot equivalent unit (TEU), while maritime transportation costs only 1 161 USD per TEU. Unlike other parts of the Asia-Pacific, investments in Central Asia rarely take part in global supply chains due to the lack of regional co-operation and transport infrastructure, as well challenges with crossing borders (ADBI, 2014[10]). For example, foreign investments in non-extractive industries are only 18% of the total FDI portfolio in Central Asia, compared to 42% of the global levels (BCG, 2018[11]).
Figure 1.1. Global connectivity

Access to global GDP (%)


Figure 1.2. Logistics costs and trade openness

Although in recent years most countries in Central Asia and the Caucasus have improved their logistics performance under the indicator of “quality of infrastructure” (e.g. ports, roads, airports, information technology) in the World Bank’s *Logistic Performance Index*, numerous infrastructure bottlenecks remain. Uzbekistan performed better than its peers between 2010 and 2018, followed by Kazakhstan and the Kyrgyz Republic (see Figure 1.3). Kazakhstan’s performance declined from 2.66 in 2010 to 2.55 in 2018 on a scale from 1 (worst) to 5 (best). While it has increased its performance compared to 2010, Mongolia’s infrastructure is perceived as the weakest in the region. In general, low-quality infrastructure leads to high costs of transportation, which hampers competitiveness. With few exceptions such as Azerbaijan and Georgia, economies of the region still face some important infrastructure shortcomings as reflected in a number of infrastructure indicators and perception assessments (see Table 1.2). Such shortcomings are also the result of an inadequate investment environment.

**Figure 1.3. The World Bank’s Logistic Performance Index, Infrastructure Indicator**

(score from 1 to 5 (best))

With regards to the energy sector, most countries have achieved universal access to energy except Mongolia. However, energy infrastructure assets are generally of poor quality due to underinvestment in maintenance and replacement of existing facilities in the past decade: losses along the electric grid are high, and power outages frequent. Coal and other fossil fuels remain the main source of energy in many countries, leading to high greenhouse gas emissions and poor air quality in urban areas of Kazakhstan and Mongolia for instance.
Table 1.2. Selected infrastructure indicators in Central Asia and the Caucasus

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Azerbaijan</th>
<th>Georgia</th>
<th>Kazakhstan</th>
<th>Kyrgyz Republic</th>
<th>Mongolia</th>
<th>Tajikistan</th>
<th>Turkmenistan</th>
<th>Uzbekistan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Energy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity production from coal sources (% of total) 2015</td>
<td>0</td>
<td>0</td>
<td>71.6</td>
<td>13.2</td>
<td>92.7</td>
<td>1.5</td>
<td>0</td>
<td>4.1</td>
</tr>
<tr>
<td>Electric power transmission and distribution losses (% of output) 2014</td>
<td>14</td>
<td>6</td>
<td>7</td>
<td>24</td>
<td>15</td>
<td>17</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>Quality of electricity supply (1-7 (best), WEF 2017-2018)</td>
<td>5.5</td>
<td>5.0</td>
<td>4.6</td>
<td>3.6</td>
<td>4.0</td>
<td>3.7</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Water and sanitation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved water source (% of population with access) 2015</td>
<td>87</td>
<td>100</td>
<td>92.9</td>
<td>90</td>
<td>64.4</td>
<td>73.8</td>
<td>60.4*</td>
<td>87.3**</td>
</tr>
<tr>
<td>Improved sanitation facilities (% of population with access)</td>
<td>89.3</td>
<td>86.3</td>
<td>97.5</td>
<td>93.3</td>
<td>59.7</td>
<td>95</td>
<td>N/A</td>
<td>100</td>
</tr>
<tr>
<td><strong>Transport</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality of roads, 1-7 (best), WEF 2017-2018</td>
<td>4.8</td>
<td>3.8</td>
<td>2.9</td>
<td>2.7</td>
<td>3.1</td>
<td>4.1</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Quality of railroad infrastructure, 1-7 (best), WEF 2017-2018</td>
<td>4.7</td>
<td>3.8</td>
<td>4.1</td>
<td>2.4</td>
<td>2.8</td>
<td>3.7</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Quality of port infrastructure, 1-7 (best), WEF 2017-2018</td>
<td>4.7</td>
<td>4.1</td>
<td>3.2</td>
<td>1.4</td>
<td>1.4</td>
<td>2.0</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Quality of air transport infrastructure,</td>
<td>5.6</td>
<td>4.3</td>
<td>4.0</td>
<td>3.1</td>
<td>3.2</td>
<td>4.3</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Since the dissolution of the Soviet Union, most of the countries in Central Asia and the Caucasus have remained heavily dependent on oil and fossil fuel-based industries. The energy sector is responsible for the majority of greenhouse gas emissions in the region (73%), followed by LULUCF (8%) and the agricultural sector (7%) (FAO, 2018[15]). The largest greenhouse gas emitter in Central Asia and the Caucasus is Kazakhstan (see Figure 1.4), emitting 0.68% of total global greenhouse gas emissions. Other countries in the region such as the Kyrgyz Republic, Georgia and Tajikistan emit a very small share of total global greenhouse gases, the lowest being in Tajikistan at 0.026%. (World Bank, 2019[13]), as it relies mainly on hydropower for their energy supply. However, those countries are particularly vulnerable to climate change that poses a great threat on water availability, and subsequently on their future energy security and agricultural sector, with potential cross-border disputes over water availability in the future.

![Graph showing GHG emissions by country, 1990-2012](https://data.worldbank.org/indicator/EN.ATM.GHGT.ZG)


**The lack of connectivity infrastructure is also a major constraint to exporting manufacturing firms**

Bottlenecks in logistics and transport infrastructure in the region are a major impediment to more intra-regional trade and investment. In particular, such bottlenecks impede
further growth of manufacturing firms, both domestic and foreign. According to the World Bank Enterprise Survey, over 22% of exporting firms identify transportation as a major constraint to their current operations (see Figure 1.5). The survey also reveals numerous differences at the country level in the region, where transport infrastructure is a major concern across the board. Compared to firms focused on the domestic market, exporting manufacturing firms face significantly more constraints to their operations in the region, particularly in Tajikistan (38% for exporters compared to 12% for non-exporters), Mongolia and Georgia (32%), the Kyrgyz Republic (23%), Kazakhstan (21%). There is no data available for Azerbaijan and Kazakhstan.

**Figure 1.5. Exporting manufacturing firms in Central Asia and the Caucasus identify transportation as a major constraint**

As % of manufacturing firms

Note: Survey data from 2013. No data available from Turkmenistan. Exporting firms include firms with direct exports with 10% or more of sales; domestic firms include non-exporters.


**Regional initiatives are an opportunity to close the gap**

The need to address infrastructure bottlenecks and to enhance connectivity is also acknowledged in the development of regional strategies (ADB, 2017[3]). A number of sub-regional projects, programmes and strategies intend to increase connectivity and spur competitiveness (see Table 1.3) (OECD, 2018[17]). This includes the European Union’s Transport Corridor Europe-Caucasus-Asia (TRACECA), as well as other regional initiatives such as the International North–South Transport Corridor or the proposed Central Asian Regional Economic Cooperation (CAREC) corridors. Such regional programmes aim to provide sufficient infrastructure to ensure a high level of transport connectivity and integration into different modes of transport (OECD, 2018[17]).
Table 1.3. Regional Transport Corridors in Central Asia

<table>
<thead>
<tr>
<th>Project name</th>
<th>Amount of investment (in USD billion)</th>
<th>Countries or continents covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belt and Road Initiative (BRI)</td>
<td>900 – 8 000</td>
<td>Europe, Asia, Africa</td>
</tr>
<tr>
<td>The Central Asia Regional Economic Cooperation (CAREC) Program</td>
<td>31.5</td>
<td>Afghanistan, Azerbaijan, People's Republic of China, Georgia, Kazakhstan, the Kyrgyz Republic, Mongolia, Pakistan, Tajikistan, Turkmenistan, Uzbekistan.</td>
</tr>
<tr>
<td>Transport Corridor Europe Caucasus Asia (TRACECA)</td>
<td>0.16</td>
<td>Armenia, Azerbaijan, Bulgaria, Georgia, Kazakhstan, the Kyrgyz Republic, Iran, Moldova, Romania, Turkey, Ukraine, Uzbekistan, Tajikistan, Turkmenistan, plus the member states of the European Union.</td>
</tr>
<tr>
<td>Trans-Asian Railway (TAR)</td>
<td>75.6</td>
<td>Afghanistan, Armenia, Azerbaijan, Bangladesh, Belarus, Bhutan, Brunei, Cambodia, China, India, Indonesia, Iran, Kazakhstan, Laos, Mongolia, Nepal, Pakistan, South Korea, Russia, Sri Lanka, Tajikistan, Thailand, Turkey, Turkmenistan, Uzbekistan, Vietnam.</td>
</tr>
</tbody>
</table>


The most comprehensive of these strategies, the CAREC programme, is a USD 31.5 billion initiative led by the Asian Development Bank that focuses on identifying and developing six main transport and trade corridors for long-term investments (see Figure 1.6). Its goal is similar to other regional initiatives in Asia to strengthen transnational economic corridors such as the Greater Mekong Subregion (GMS) and the South Asia Subregional Economic Cooperation (SASEC) Programme (ADB, 2015[18]). Yet, compared to other regions in Asia, CAREC’s recipient countries remain less integrated in terms of trade and investment (AIIB, 2019[9]). The six CAREC corridors are (see Figure 1.5):

- **Corridor 1**: Europe–East Asia (Kazakhstan, the Kyrgyz Republic, and Xinjiang Uygur Autonomous Region);
- **Corridor 2**: Mediterranean–East Asia (Afghanistan, Azerbaijan, Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan Uzbekistan, and Xinjiang Uygur Autonomous Region);
- **Corridor 3**: Russian Federation–Middle East and South Asia (Afghanistan, Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan);
- **Corridor 4**: Russian Federation–East Asia (Inner Mongolia Autonomous
Region and Xinjiang Uygur Autonomous Region in the People’s Republic of China, and Mongolia);

- **Corridor 5**: East Asia–Middle East and South Asia (Afghanistan, the Kyrgyz Republic, Pakistan, Tajikistan, and Xinjiang Uygur Autonomous Region).

- **Corridor 6**: Europe–Middle East and South Asia (Afghanistan, Kazakhstan, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan) (ADB, 2014[19])

![Figure 1.6. Map of CAREC Economic Corridors](https://www.carecprogram.org/?page_id=31)


Another significant global infrastructure initiative with significant implications for Central Asia and the Caucasus is China’s Belt and Road Initiative (BRI). Proposed in 2013, the BRI aims to improve global connectivity and co-operation. While the scope of the BRI is still not yet clearly defined, there are two main components involving investments in infrastructure, namely the Silk Road Economic Belt (the overland “Belt”) and the New Maritime Silk Road (the sea routes constituting the “Road”) (Freund and Ruta, 2018[21]). The Belt will link China to Central and South Asia and onward to Europe, while the Road will better connect China with Southeast Asia, the countries of the Persian Gulf, East and North Africa and to Europe. The BRI could significantly
improve trade, investment and living conditions for citizens in the region. However, this will only occur if China and the individual recipient countries implement deeper policy reforms aimed at improving transparency, expanding trade, improving debt sustainability, while mitigating environmental, social and governance risks (World Bank, 2019[22]). As part of the BRI, there are six proposed overland economic corridors (see Figure 1.7):

1. China–Mongolia–Russia Economic Corridor
2. New Eurasian Land Bridge
3. China–Central Asia–West Asia Economic Corridor
4. China–Indochina Peninsula Economic Corridor
5. China–Pakistan Economic Corridor
6. Bangladesh–China–India–Myanmar Economic Corridor

Figure 1.7. Map of China’s Belt and Road Initiative (BRI)

In recent years, the economies of Central Asia and the Caucasus became large recipients of Chinese investments, with over USD 60.8 billion of investments between 2005 and 2018 (Figure 8.9). The China Global Investment Tracker, a database that tracks investment projects by China worldwide, shows that most of these investments in the region focus on the energy sector, accounting for over 68% (or USD 41 billion) of total investments. The transport sector, by contrast, has received only 11% of total Chinese investments, followed by metals (10%) and chemicals (7%). The largest recipient of Chinese investments in the region is Kazakhstan, with over USD 32.6 billion, including
with major investments as part of the BRI since 2013, followed by Turkmenistan and Mongolia with each USD 6.8 and 6.2 billion.

Figure 1.8. Chinese Investments across Central Asia and the Caucasus, by sector

![Image of Figure 1.8]

Note: Other includes projects in agriculture; tourism; real estate (construction and property); industry; banking; and timber.

1.2. The investment environment

The investment climate is improving in the region but private sector participation needs to be scaled-up

In recent years, many countries in Central Asia and the Caucasus have become more attractive destinations for investment. Their improving investment climates are reflected in selected indicators in Table 1.4. According to the World Bank Doing Business indicators, the region has made progress in the areas of fiscal, regulatory and political reforms. Increased electricity access, coupled with strengthened rule of law and better corporate tax regulations have further improved the confidence of investors to invest in individual countries in the region. For instance, Georgia has become one of the most open economies in the world in terms of ease of doing business, ranking 6th worldwide in 2019. Azerbaijan and Kazakhstan also performed relatively better than their regional peers in 2019, ranking 25th and 28th worldwide.

In most countries, further reforms are needed to further leverage domestic and international private investment. Business entry rates in the Central Asia and the Caucasus region are much lower than in other regions and even lower than in sub-Saharan Africa (IMF, 2018[25]). Among the most common challenges to doing business in the region is access to finance, tax rates and regulation, inflation and corruption.
Promoting more private sector participation and opening up to more trade and investment could allow access to cheaper goods and services, as well as more diversification and competition (IMF, 2018[25]).

Table 1.4. Selected economic indicators in Central Asia and the Caucasus

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Azerbaijan</th>
<th>Georgia</th>
<th>Kazakhstan</th>
<th>Kyrgyz Republic</th>
<th>Mongolia</th>
<th>Tajikistan</th>
<th>Turkmenistan</th>
<th>Uzbekistan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real GDP growth (year-on-year change, 2019)</td>
<td>1.4%</td>
<td>4.6%</td>
<td>3.2%</td>
<td>3.8%</td>
<td>6.3%</td>
<td>5%</td>
<td>6.3%</td>
<td>5.1%</td>
</tr>
<tr>
<td>GDP per capita (USD, current price, 2018)</td>
<td>4 721</td>
<td>4 345</td>
<td>9 331</td>
<td>1 220</td>
<td>4 104</td>
<td>827</td>
<td>6 967</td>
<td>1 532</td>
</tr>
<tr>
<td>FDI, net inflows (as % of GDP)</td>
<td>3.0%</td>
<td>7.3%</td>
<td>0.1%</td>
<td>-1.4%</td>
<td>16.7%</td>
<td>2.9%</td>
<td>6.1%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Ease of Doing Business Rank</td>
<td>25</td>
<td>6</td>
<td>28</td>
<td>70</td>
<td>74</td>
<td>60</td>
<td>N/A</td>
<td>76</td>
</tr>
<tr>
<td>Number of procedures to start a business (women, 2019)</td>
<td>3</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>8</td>
<td>4</td>
<td>N/A</td>
<td>3</td>
</tr>
<tr>
<td>Number of days to start a business (women, 2019)</td>
<td>3.5</td>
<td>2</td>
<td>5</td>
<td>10</td>
<td>11</td>
<td>11</td>
<td>N/A</td>
<td>4</td>
</tr>
<tr>
<td>Ability to trade across borders across Borders (0 to 100 best performance, 2019)</td>
<td>77.4</td>
<td>90.3</td>
<td>70.36</td>
<td>80.74</td>
<td>66.89</td>
<td>59.06</td>
<td>N/A</td>
<td>49.79</td>
</tr>
<tr>
<td>Transparency, accountability and corruption in the public sector rating (1= most corrupt, 6 = least corrupt, 2017)</td>
<td>2.5</td>
<td>3.5</td>
<td>N/A</td>
<td>3</td>
<td>3.5</td>
<td>2.5</td>
<td>N/A</td>
<td>2</td>
</tr>
</tbody>
</table>


*Shifting investments away from fossil fuel and mineral resources extraction*

Many countries of the region are trying to diversify their economies, limiting their dependence over fossil fuels and extractive industries. But a review of greenfield foreign
direct investments in the region shows that FDIs are still disproportionately flowing to extractive and fossil fuel projects. Between 2003 and 2017, greenfield FDIs in the region accounted for over USD 228.8 billion, 43% of which belonged into coal, oil and natural gas sectors (see Figure 1.9). These sectors are the most attractive for greenfield FDI across almost all countries. Kazakhstan attracted the largest share with USD 56.4 billion, followed by Azerbaijan and Uzbekistan with 16.2 and 13 USD billion respectively. Although at a much lower scale, investments into metals accounted for a total of USD 34.3 billion (or 15% of the total), followed by real estate at 7% (or USD 15.5 billion). Infrastructure-related investments, particularly in the transport sector attracted close to USD 12.9 billion (or 6% of total greenfield FDI), while the building and construction sector only accounted for 2% (USD 4.4 billion). Other sectors that attracted greenfield FDI were chemicals (5%), financial services (4%) and alternative/renewable energy (3%). The limited FDI in the alternative/renewable sector shows that there is significant scope for foreign investors to enter these markets provided that the right incentives and business environment are in place.

Figure 1.9. Greenfield FDI in Central Asia and the Caucasus by economic activity, 2003-2017.

Note: Other includes Pharmaceuticals; Non-Automotive Transport OEM; Leisure & Entertainment; Rubber; Beverages; Software & IT services; Electronic Components; Automotive Components; Aerospace; Engines & Turbines; Healthcare; Business Machines & Equipment; Paper, Printing & Packaging; Medical Devices; Biotechnology; Semiconductors; Wood Products.

1.3. Overview of current infrastructure projects, planned and under construction

The database put together for this analysis tracks around USD 546 billion of planned and under construction infrastructure projects in the eight countries - Azerbaijan, Georgia, Kazakhstan, the Kyrgyz Republic, Mongolia, Tajikistan, Turkmenistan and Uzbekistan. Energy projects account for more than half (53% or USD 289 billion), followed by manufacturing projects (22% or USD 117.9 billion) and transport (17% or USD 94.2 billion) (see Figure 1.10). Finally, water projects only account for 1%, or USD 4.9 billion of total investments and they primarily relate to water supply and sanitation projects. Within energy investments, upstream oil and gas projects account for over 42% (or USD 122.7 billion), followed by electricity generation projects (30% or USD 88 billion) and oil and gas pipelines (22% or USD 62.9 billion). Finally, electric power transmission and distribution investments account for 5% (or USD 15.3 billion).

Figure 1.10. Investment projects in Central Asia and the Caucasus, by sector

![Investment projects in Central Asia and the Caucasus, by sector](image)

Notes: Electricity generation projects include natural gas-fired electric power plants, wind farms, solar plants, hydroelectric power plants, and coal-fired electric power plants. Electric Power Transmission and Distribution projects include district heating projects, central transmission and distribution networks, double circuit transmission lines. 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 plans, metallurgical complexes, production of motor fuels, acid plants, steel plants, bioethanol plants, and other transport equipment. Transport projects include intermodal projects, railways and roads. Water projects include water supply and sanitation as well as irrigation and water management.

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

The top two countries in Central Asia and the Caucasus in terms of infrastructure investments are Kazakhstan (33%) and Azerbaijan (23%). Mongolia and Uzbekistan

---

4 Energy projects include oil and gas pipelines, upstream oil and gas projects, electric power transmission and distribution projects, as well as electricity generation projects.
both attract 11% of total investments, followed by Georgia (7%), Tajikistan and Turkmenistan (6% each), and the Kyrgyz Republic (3%).

**Figure 1.11. Investment projects planned and under construction in Central Asia and the Caucasus countries, by sector**

![Bar chart showing investment projects planned and under construction in Central Asia and the Caucasus countries, by sector.](image)

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

**Transport**

Transport infrastructure projects in the database account for around USD 94.2 billion, and consist mostly of road projects of around USD 56.8 billion or 60% of total transport investments (see Figure 1.12). Investments in railways come second at around USD 29.8 billion (or 32%), followed by port projects totalling USD 3.9 billion (4%). While roads attracted the majority of transport investments in the region, railways will also require significant investments flows in the coming years to maintain and improve performance. It is estimated that the region will need around USD 38 billion up to 2030 to upgrade rails and build new lines (AIIB, 2019[9]). Better rail connectivity in the form of new investments in technology and improved logistics could reduce existing bottlenecks, such as track gauge differences and further enhance the region’s participation in regional and global value chains.
Figure 1.12. Transport projects planned and under construction in Central Asia and the Caucasus, by sub-sector

In USD million

- Roads, 56 801
- Railways, 29 770
- Intermodal, 743
- Airports, 987
- Ports, 3 854

Notes: Intermodal projects include the development of logistics centres. Source: OECD analysis based on accessed databases as of June 2019

Energy

In terms of investment projects in electricity generation in the region, around 50% of the investments by capacity are in hydro-power plants (or 20 339 MW), while coal and natural gas-fired electric power plants account for 40% of the total. Other renewable projects such as solar photovoltaic (PV) and wind account for 10% of electricity generation (see Figure 1.13). The hydropower projects are primarily concentrated in Georgia and Tajikistan, which have high hydropower potential. These countries’ focus on hydroelectric power plants is in line with their governments’ objectives to develop power generation capacity to sell excess electricity to neighbouring countries. Despite the relatively low investments in other renewable energies, some countries in the region identify the use of renewable energy sources as an important component of their sustainable development strategies. At the national level, prominent examples include Kazakhstan’s Concept for the Transition towards a Green Economy and Uzbekistan’s Action Strategy on Five Priority Directions 2017-2021.
Figure 1.13. Electricity generation projects by fuel

Note: Renewable energy includes solar PV and wind, while coal and natural gas includes coal-fired electric power plants and natural gas-fired electric power plants.


Agency for Statistics under the President of the Republic of Tajikistan (2017), Таджикистан в цифрах [Tajikistan in figures], http://stat.ww.tj/e37b548394b7b88961c832850b383539_1508737633.pdf.


Asia Regional Integration Center (2008), Mongolia-Republic of Korea Free Trade Agreement, https://aric.adb.org/fta/korea-mongolia-free-trade-agreement.


Chamber of Commerce and Industry of the Republic of Tajikistan (n.d.), *Аналитические данные о притоке иностранных инвестиций в экономику Республики Таджикистан в период 2007-2015 г.* [Analytical data on foreign investment inflow into the economy of the Republic of Tajikistan for the period 2007-2015], http://tp.tj/business-guide2017/rus/pdf/%D0%90%D0%BD%D0%B0%D0%BB%D0%B8%D1%82%D0%B8% D1%87%D0%B5%D1%81%D0%BA%D0%B8%D0%B5%20%D0%B4%D0%B0%D0%BD%D0% BD%D1%8B%D0%B5%20%D0%BE%20%D0%BF%D1%80%D0%B8%D1%82%D0%BE%D0%BA%D0%B5%20%D0%B8%D0%BD%D0%BE%D1%81%D1%82%D1%80%D0% .


Climate Watch (2019), *Data for Climate Action: Turkmenistan*, https://www.climatewatchdata.org/countries/TKM.


EU Neighbours (2018), *Azerbaijan is developing its Energy Strategy and Law on Energy efficiency: but what do they mean for the country?*,


European Commission (2017), *EU-Georgia Trade: Deep and Comprehensive Free Trade Area (DCFTA)*, European Commission,


FAO (2018), *Regional Analysis of the Nationally Determined Contributions of Countries in Southern-Eastern Europe and Central Asia*, FAO, Rome,


fDi Markets (2019), *fDi Markets: the in-depth crossborder investment monitor (database)*,
https://www.fdimarkets.com/.

Financial Tribune (2017), *Georgia, Iran, Azerbaijan to Launch Transport Corridor*,

Freund, C. and M. Ruta (2018), *Overview: BRI at a Glance*, World Bank,

Ganiev, B. and Y. Yusupov (2012), *Uzbekistan: Trade Regime and Recent Trade Developments*, University of Central Asia,


Unclassified


Kyrgyz Temir Zholu (n.d.), *Все станции [All stations]*, http://kjd.kg/ru/station/.


Ministry of Justice of the Kyrgyz Republic (2016), СТРАТЕГИЯ: управления государственным долгом Кыргызской Республики на 2016-2018 годы, 


National Bank of Kazakhstan (2018), 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], https://nationalbank.kz/?docid=887&switch=russian.


News of Uzbekistan (2019), В Узбекистане создается Министерство транспорта [In Uzbekistan the Ministry of Transport is being created], https://nuz.uz/politika/38538-v-uzbekistane-sozdaetsya-ministerstvo-transporta.html.


SES Professionals (n.d.), Overview of Mongolia’s Mining Industry, 


SourceWatch (2019), Tevshiin Gobi Power Station, 

SourceWatch (2017), Ekibastuz-2 Power Station, 

Sow, M. (2018), Figures of the week: Africa’s intra- and extra-regional trade, Brookings, 

State Agency of Environmental Protection and Forestry under the Government of the Kyrgyz Republic (2013), Климатический профиль Кыргызской Республики [Climate Profile of the Kyrgyz Republic],

State Great Hural of Mongolia (2016), Mongolia Sustainable Development Vision 2030, 

State News Agency of Turkmenistan (2019), На правительственном заседании рассмотрены проекты ряда программ отраслевого развития [The government meeting reviewed projects of a number of sectoral development programs],

State News Agency of Turkmenistan (n.d.), Законодательство [Legislation], 

Strommashina (n.d.), The Cement Industry of Uzbekistan, 

Sustainable Infrastructure Tool Navigator (n.d.), Sustainable Infrastructure Tools, 
https://sustainable-infrastructure-tools.org/?s=&used_by=Project+Team&used_by=Developers&used_by=Operators.


TRACECA (n.d.), *Country Report on Infrastructure and Finance Tajikistan*,

[210]


[73]

Trans-Caspian Pipeline (n.d.), *The European Commission’s Connecting Europe Facility is funding the PRE- FEED, Reconnaissance Surveys and Strategic and Economic Evaluations of the Trans-Caspian Pipeline*, http://www.w-stream-transcaspian.com/.

[74]


[288]

Turkmen Portal (2019), В Туркменистане созданы Министерство сельского хозяйства и охраны окружающей среды и Госкомитет водного хозяйства [Turkmenistan has created the Ministry of Agriculture and Environmental Protection and the State Committee for Water Management], https://turkmenportal.com/blog/17300/v-turkmenistane-sozdany-ministerstvo-selskogo-hozyaistva-i-ohrany-okruzhayushchei-sredy-i-goskomitet-vodnogo-hozyaistva.

[247]


[244]


[240]

UN Environment (2019), *Integrated Approaches to Sustainable Infrastructure*, UN Environment, Geneva,

[294]


[103]


[160]


[204]

UNDP (2012), Национальная стратегия Туркменистана по изменению климата [Turkmenistan’s National Climate Change Strategy], UNDP, New York,

[236]


World Bank (2016), *Systematic Country Diagnostic for Uzbekistan*, World Bank, Washington DC, [https://openknowledge.worldbank.org/bitstream/handle/10986/24588/Uzbekistan000S0c0country0diagnostic.pdf?sequence=1&isAllowed=y](https://openknowledge.worldbank.org/bitstream/handle/10986/24588/Uzbekistan000S0c0country0diagnostic.pdf?sequence=1&isAllowed=y).

World Bank (2015), *Azerbaijan Systematic Country Diagnostic*, World Bank, Washington DC, [https://openknowledge.worldbank.org/bitstream/handle/10986/23105/Azerbaijan000S00country0diagnostic0.pdf?sequence=1&isAllowed=y](https://openknowledge.worldbank.org/bitstream/handle/10986/23105/Azerbaijan000S00country0diagnostic0.pdf?sequence=1&isAllowed=y).


https://www.wto.org/english/thewto_e/acc_e/a1_ouzbekistan_e.htm.

[250]


[97]

Zakon.kz (2019), *Что думают эксперты о создании Министерства экологии Казахстана* [What do experts think about the creation of the Ministry of Ecology of Kazakhstan],

[152]