Green Finance and Investment

Sustainable Infrastructure for Low-Carbon Development in Central Asia and the Caucasus

HOTSPOT ANALYSIS AND NEEDS ASSESSMENT

OECD

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Foreword

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.

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Table of Contents

Foreword **3**

Reader's Guide **11**

Executive Summary **15**

Chapter 1. Overview **19**

1.1 The infrastructure gap in Central Asia and the Caucasus 20
1.2 The investment environment 30
1.3 Overview of current infrastructure projects, planned and under construction 33
Notes 37
References 37

Chapter 2. Investment in sustainable infrastructure in Azerbaijan **41**

Overview 42
2.1 State of play: economy, investment and climate change in Azerbaijan 43
2.2 Azerbaijan's infrastructure needs and current plans 49
2.3 Strengths and weaknesses of existing institutional set-up for sustainable infrastructure planning 62
References 65

Chapter 3. Georgia's sustainable infrastructure investments **71**

Overview 72
3.1 State of play: economy, investment and climate change in Georgia 73
3.2 Georgia's infrastructure needs and current plans 79
3.3 Strengths and weaknesses of existing institutional set-up for sustainable infrastructure planning 90
Notes 95
References 95

Chapter 4. Trends in Kazakhstan's sustainable infrastructure investments **101**

Overview 102
4.1 State of play: economy, investment and climate change in Kazakhstan 103
4.2 Kazakhstan's infrastructure needs and current plans 108
4.3 Strengths and weaknesses of existing institutional set-up for sustainable infrastructure planning 121
Notes 124
References 124

Chapter 5. Investment in sustainable infrastructure in the Kyrgyz Republic **127**

Overview 128
5.1. State of play: economy, investment and climate change in the Kyrgyz Republic 129
5.2. Kyrgyz Republic's infrastructure needs and current plans 135

5.3. Strengths and weaknesses of existing institutional set-up for sustainable infrastructure planning 141
References 145

Chapter 6. Mongolia's sustainable infrastructure investments 149

Overview 150
6.1. State of play: economy, investment and climate change in Mongolia 151
6.2. Mongolia's infrastructure needs and current plans 158
6.3. Strengths and weaknesses of existing institutional set-up for sustainable infrastructure planning 170
References 175

Chapter 7. Trends in Tajikistan's sustainable infrastructure investments 179

Overview 180
7.1. State of play: economy, investment and climate change in Tajikistan 181
7.2. Tajikistan's infrastructure needs and current plans 187
7.3. Strengths and weaknesses of existing institutional set-up for sustainable infrastructure planning 199
Notes 203
References 203

Chapter 8. Investment in sustainable infrastructure in Turkmenistan 207

Overview 208
8.1. State of play: economy, investment and climate change in Turkmenistan 209
8.2. Turkmenistan's infrastructure needs and current plans 214
8.3. Strengths and weaknesses of existing institutional set-up for sustainable infrastructure planning 221
Notes 224
References 224

Chapter 9. Uzbekistan's sustainable infrastructure investments 229

Overview 230
9.1. State of play: economy, investment and climate change in Uzbekistan 231
9.2. Uzbekistan's infrastructure needs and current plans 238
9.3. Strengths and weaknesses of existing institutional set-up for sustainable infrastructure planning 251
Notes 254
References 254

Annex A. Overview of selected sustainable infrastructure standards and norms 261

1. The need for sustainable infrastructure definitions, standards and tools 261
2. Navigating the multitude of principles, standards and norms 263
References 271

Tables

Table 1.1. Estimated Infrastructure Needs by Region, 2016-2030 (USD billion in 2015 prices) 20
Table 1.2. Selected infrastructure indicators in Central Asia and the Caucasus 25
Table 1.3. Regional Transport Corridors in Central Asia 28
Table 1.4. Selected economic indicators in Central Asia and the Caucasus 31

Table 2.1. Key indicators on Azerbaijan's economy 43
Table 2.2. Hotspot projects in the transport sector in Azerbaijan 55
Table 2.3. Hotspot projects in the energy sector in Azerbaijan 58
Table 2.4. Hotspot industry projects in Azerbaijan 61
Table 2.5. Main strategic documents in force 63
Table 2.6. Other relevant documents 65
Table 3.1. Key indicators on Georgia's economy 73
Table 3.2. Hotspot projects in the transport sector in Georgia 84
Table 3.3. Hotspot projects in the energy sector in Georgia – under construction 88
Table 3.4. Main strategic documents in force 92
Table 3.5. Other relevant documents 94
Table 4.1. Key indicators on Kazakhstan's economy 103
Table 4.2. Hotspot projects in the transport sector in Kazakhstan 113
Table 4.3. Hotspot projects in the energy sector in Kazakhstan 116
Table 4.4. Hotspot projects in the industry and mining sector in Kazakhstan 119
Table 4.5. Main strategic documents in force 123
Table 4.6. Other relevant documents 124
Table 5.1. Key indicators on the Kyrgyz Republic's economy 129
Table 5.2. Hotspot projects in the transport sector in the Kyrgyz Republic 138
Table 5.3. Hotspot projects in the energy sector in the Kyrgyz Republic 140
Table 5.4. Main strategic documents in force 144
Table 5.5. Other relevant documents 145
Table 6.1. Key indicators on Mongolia's economy 151
Table 6.2. Hotspot projects in the transport sector in Mongolia 162
Table 6.3. Hotspot projects in the energy sector in Mongolia 166
Table 6.4. Hotspot projects in the industry and mining sector in Mongolia 168
Table 6.5. Main strategic documents in force 172
Table 6.6. Other relevant documents 175
Table 7.1. Key indicators on Tajikistan's economy 181
Table 7.2. Hotspot projects in the transport sector in Tajikistan 190
Table 7.3. Hotspot projects in the energy sector in Tajikistan 194
Table 7.4. Hotspot projects in the industry and mining sectors in Tajikistan 197
Table 7.5. Main strategic documents in force 201
Table 7.6. Other relevant documents 203
Table 8.1. Key indicators on Turkmenistan's economy 209
Table 8.2. Hotspot projects in the transport sector in Turkmenistan 217
Table 8.3. Hotspot projects in the energy sector in Turkmenistan 219
Table 8.4. Hotspot projects in the industry sector in Turkmenistan 220
Table 8.5. Main strategic documents in force 222
Table 8.6. Other relevant documents 224
Table 9.1. Key indicators on Uzbekistan's economy 231
Table 9.2. Hotspot projects in the transport sector in Uzbekistan 242
Table 9.3. Hotspot projects in the energy sector in Uzbekistan 246
Table 9.4. Hotspot projects in the industry sector in Uzbekistan 249
Table 9.5. Main strategic documents in force 253
Table 9.6. Other relevant documents 254

Table A.1. Organisation structure of the Sustainable infrastructure tools navigator 264
Table A.2. Standards listed in the Sustainable Infrastructure Tool Navigator 265

Table A.3. Examples of internationally recognised instruments and standards related to sustainable infrastructure 269

Figures

Figure 1. Quality of infrastructure in selected countries of Central Asia and the Caucasus 16
Figure 1.1. Global connectivity 22
Figure 1.2. Logistics costs and trade openness 23
Figure 1.3. The World Bank's Logistic Performance Index, Infrastructure Indicator 24
Figure 1.4. GHG emissions by country, 1990-2012 26
Figure 1.5. Exporting manufacturing firms in Central Asia and the Caucasus identify transportation as a major constraint 27
Figure 1.6. Map of CAREC Economic Corridors 29
Figure 1.7. Chinese investments across Central Asia and the Caucasus, by sector 30
Figure 1.8. Greenfield FDI in Central Asia and the Caucasus by economic activity, 2003-2017 32
Figure 1.9. Investment projects in Central Asia and the Caucasus, by sector 33
Figure 1.10. Investment projects planned and under construction in Central Asia and the Caucasus countries, by sector 34
Figure 1.11. Transport projects planned and under construction in Central Asia and the Caucasus, by sub-sector 35
Figure 1.12. Electricity generation projects by fuel 36
Figure 2.1. Trade of Azerbaijan 45
Figure 2.2. Greenfield FDI in Azerbaijan by economic activity, 2003-2017 47
Figure 2.3. FDI in Azerbaijan by source country, 2009-2017 48
Figure 2.4. GHG emissions and GDP of Azerbaijan, 1990-2017 49
Figure 2.5. Quality of infrastructure in Azerbaijan 50
Figure 2.6. Investment projects in Azerbaijan, by sector 51
Figure 2.7. Inland transport infrastructure investment in Azerbaijan (2012-2016) 52
Figure 2.8. Transport projects in Azerbaijan, by sub-sector 54
Figure 2.9. Electricity generation by fuel (GWh, 2016) 56
Figure 2.10. Manufactured product categories by value, 2017 59
Figure 2.11. Industry projects in Azerbaijan, by sub-sector 60
Figure 3.1. Trade of Georgia 75
Figure 3.2. FDI in Georgia by source country, 2006-2017 76
Figure 3.3. Greenfield FDI in Georgia by economic activity, 2003-2017 77
Figure 3.4. GHG emissions and GDP of Georgia, 1990-2017 78
Figure 3.5. Quality of infrastructure in Georgia 79
Figure 3.6. Infrastructure projects in Georgia by sector 80
Figure 3.7. Inland transport infrastructure investment in Georgia (2002-2016) 81
Figure 3.8. Transport projects in Georgia by sub-sector 83
Figure 3.9. Electricity generation by fuel (GWh, 2016) 86
Figure 3.10. Electricity generation projects in Georgia, by fuel 87
Figure 3.11. Water projects in Georgia by sub-sector 90
Figure 4.1. Trade of Kazakhstan 104
Figure 4.2. FDI in Kazakhstan by source country, 2018 105
Figure 4.3. Greenfield FDI in Kazakhstan by economic activity, 2003-2017 106
Figure 4.4. GHG emissions and GDP of Kazakhstan, 1990-2017 108
Figure 4.5. Quality of infrastructure in Kazakhstan 109

Figure 4.6. Infrastructure investment needs in Kazakhstan, 2016-2040 110
Figure 4.7. Infrastructure projects in Kazakhstan by sector 110
Figure 4.8. Transport projects in Kazakhstan by sub-sector 112
Figure 4.9. Electricity generation by fuel (GWh, 2016) 114
Figure 4.10. Planned electricity generation projects in Kazakhstan, by fuel 115
Figure 4.11. Industrial projects in Kazakhstan by sub-sector 118
Figure 4.12. Mining projects in Kazakhstan, by mineral 120
Figure 4.13. Water projects in Kazakhstan by sub-sector 121
Figure 5.1. Trade of the Kyrgyz Republic 131
Figure 5.2. FDI in the Kyrgyz Republic by source country, 2017 132
Figure 5.3. Greenfield FDI in the Kyrgyz Republic by economic activity, 2003-2017 133
Figure 5.4. GHG emissions and GDP of the Kyrgyz Republic, 1990-2017 134
Figure 5.5. Quality of infrastructure in the Kyrgyz Republic 135
Figure 5.6. Infrastructure projects in Kyrgyz Republic by sector 136
Figure 5.7. Transport projects in the Kyrgyz Republic by sub-sector 137
Figure 5.8. Electricity generation by fuel (GWh, 2016) 139
Figure 5.9. Water projects in the Kyrgyz Republic by sub-sector 141
Figure 6.1. Trade of Mongolia 153
Figure 6.2. FDI in Mongolia by source country, 2011-2018 155
Figure 6.3. Greenfield FDI in Mongolia by economic activity, 2003-2017 156
Figure 6.4. GHG emissions and GDP of Mongolia (1990-2017) 157
Figure 6.5. Quality of infrastructure in Mongolia 158
Figure 6.6. Investment projects in Mongolia, by sector 159
Figure 6.7. Transport projects in Mongolia, by sub-sector 161
Figure 6.8. Electricity generation by fuel (GWh, 2016) 164
Figure 6.9. Electricity generation projects in Mongolia, by fuel 165
Figure 6.10. Mining projects in Mongolia 169
Figure 7.1. Trade of Tajikistan 183
Figure 7.2. FDI in Tajikistan by source country, 2007-2015 184
Figure 7.3. Greenfield FDI in Tajikistan by economic activity, 2003-2017 185
Figure 7.4. GHG emissions and GDP of Tajikistan, 1990-2017 186
Figure 7.5. Quality of infrastructure in Tajikistan 187
Figure 7.6. Infrastructure projects in Tajikistan by sector 188
Figure 7.7. Transport projects in Tajikistan by sub-sector 190
Figure 7.8. Electricity generation by fuel (GWh, 2016) 192
Figure 7.9. Electricity generation projects in Tajikistan, by fuel 193
Figure 7.10. Mining and industrial production of Tajikistan, 2011-2015 196
Figure 7.11. Industry and mining projects in Tajikistan by sub-sector 197
Figure 7.12. Water projects in Tajikistan by sub-sector 199
Figure 8.1. Trade of Turkmenistan 210
Figure 8.2. FDI in Turkmenistan by source country, 2012 212
Figure 8.3. Greenfield FDI in Turkmenistan by economic activity, 2003-2017 213
Figure 8.4. GHG emissions and GDP of Turkmenistan, 1990-2017 214
Figure 8.5. Infrastructure projects in Turkmenistan by sector 215
Figure 9.1. Trade of Uzbekistan 232
Figure 9.2. OECD Trade Facilitation Indicators 234
Figure 9.3. FDI in Uzbekistan by source country, 2017 236
Figure 9.4. Greenfield FDI in Uzbekistan by economic activity, 2003-2017 237
Figure 9.5. GHG emissions and GDP of Uzbekistan, 1990-2017 238
Figure 9.6. Infrastructure projects in Uzbekistan, by sector 239

Figure 9.7. Transport projects in Uzbekistan by sub-sector....241
Figure 9.8. Electricity generation in Uzbekistan by fuel 244
Figure 9.9. Electricity generation projects in Uzbekistan, by fuel....245
Figure 9.10. Industrial production of Uzbekistan, 2012-2015....247
Figure 9.11. Industry projects in Uzbekistan, by sub-sector....248
Figure 9.12. Water projects in Uzbekistan....251

Boxes

Box A.1. Defining sustainable infrastructure....263

Reader's Guide

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**:[1] 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

[1] 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).

provides a list of selected international principles, standards and instruments applicable to sustainable infrastructure, with a specific focus on OECD standards and principles.

Executive Summary

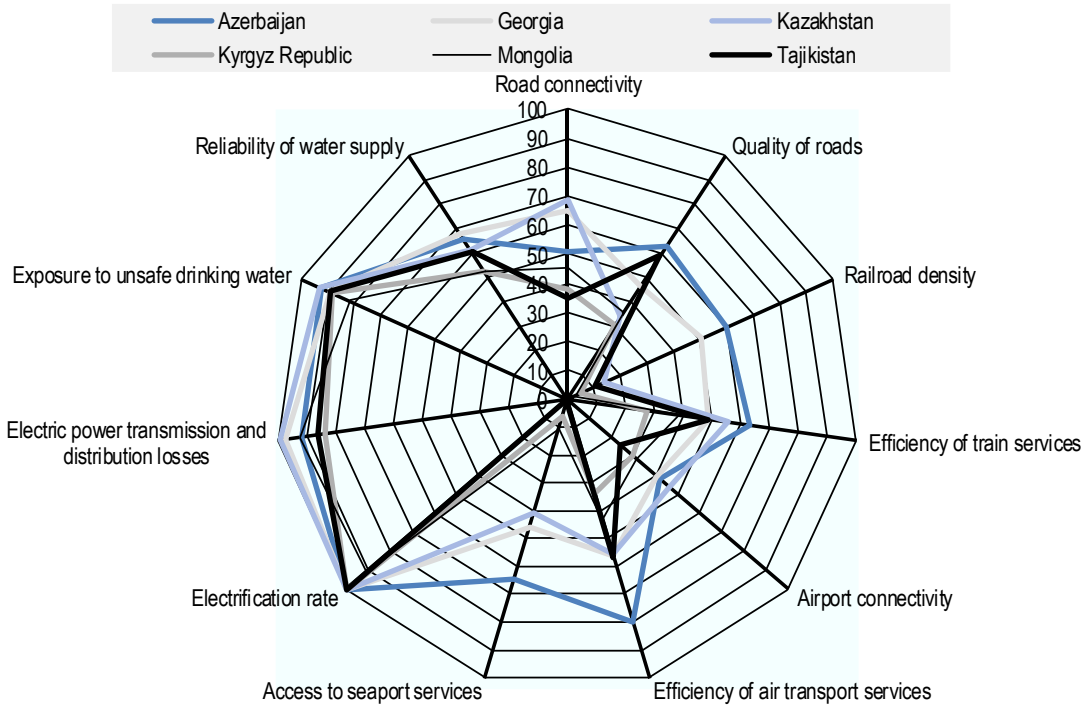
Most economies of Central Asia and the Caucasus[2] have seen unprecedented growth over the past two decades, reaping benefits of market reforms and taking advantage of relatively high commodity prices in hydrocarbon and metals. As they are now looking at diversifying their economies and integrating to 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.[3] 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.

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

[3] ADB (2017), *Meeting Asia's Infrastructure Needs*, Asian Development Bank, Manila, https://www.adb.org/sites/default/files/publication/227496/special-report-infrastructure.pdf.

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



Source: World Economic Forum (2017[1]), *The Global Competitiveness Report 2017-2018*, World Economic Forum, http://www3.weforum.org/docs/GCR2017-2018/05FullReport/TheGlobalCompetitivenessReport2017%E2%80%932018.pdf

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.

Chapter 1. Overview

This chapter presents the regional situation of infrastructure investments in Central Asia and the Caucasus, including the gap between growing infrastructure needs and sluggish investment flows, and the resulting challenges for trade integration and regional connectivity. It describes regional infrastructure development initiatives, including the CAREC corridors and the Belt and Road Initiative, and their potential role in improving connectivity. The chapter also discusses the role of private sector investments and the climate change-related risks and opportunities of current infrastructure investment patterns. Lastly, it presents the makeup of current infrastructure investments in eight countries in Central Asia and the Caucasus (Azerbaijan, Georgia, Kazakhstan, the Kyrgyz Republic, Mongolia, Tajikistan, Turkmenistan, Uzbekistan), focusing on the transport and energy sectors.

1.1 The infrastructure gap in Central Asia and the Caucasus

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[1]).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[1]). 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)

	Projected Annual GDP Growth	Baseline Estimates			Climate-adjusted Estimates		
		Investment Needs	Annual Average	Investment Needs as % of GDP	Investment Needs	Annual Average	Investment Needs as % of GDP
Central Asia and Caucasus	3.1	492	33	6.8	565	38	7.8
East Asia	5.1	13 781	919	4.5	16 062	1 071	5.2
South Asia	6.5	5 447	365	7.6	6 347	423	8.8
Southeast Asia	5.1	2 759	184	5.0	3 147	210	5.7
The Pacific	3.1	42	2.8	8.2	46	3.1	9.1
Total Asia and the Pacific	**5.3**	**22 551**	**1 503**	**5.1**	**26 166**	**1 744**	**5.9**

Source: ADB (2017[2])(2017), *Meeting Asia's Infrastructure Needs*, Asian Development Bank, Manila, https://www.adb.org/sites/default/files/publication/227496/special-report-infrastructure.pdf

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[3]) and 15% for oil importers in the region (Kunzel et al., 2019[4]), which remains very low by international standards and compares unfavourably to intra-Asia and intra-Europe exports, at 59% and 69% respectively (Sow, 2018[5]). 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[6]). 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[7]).

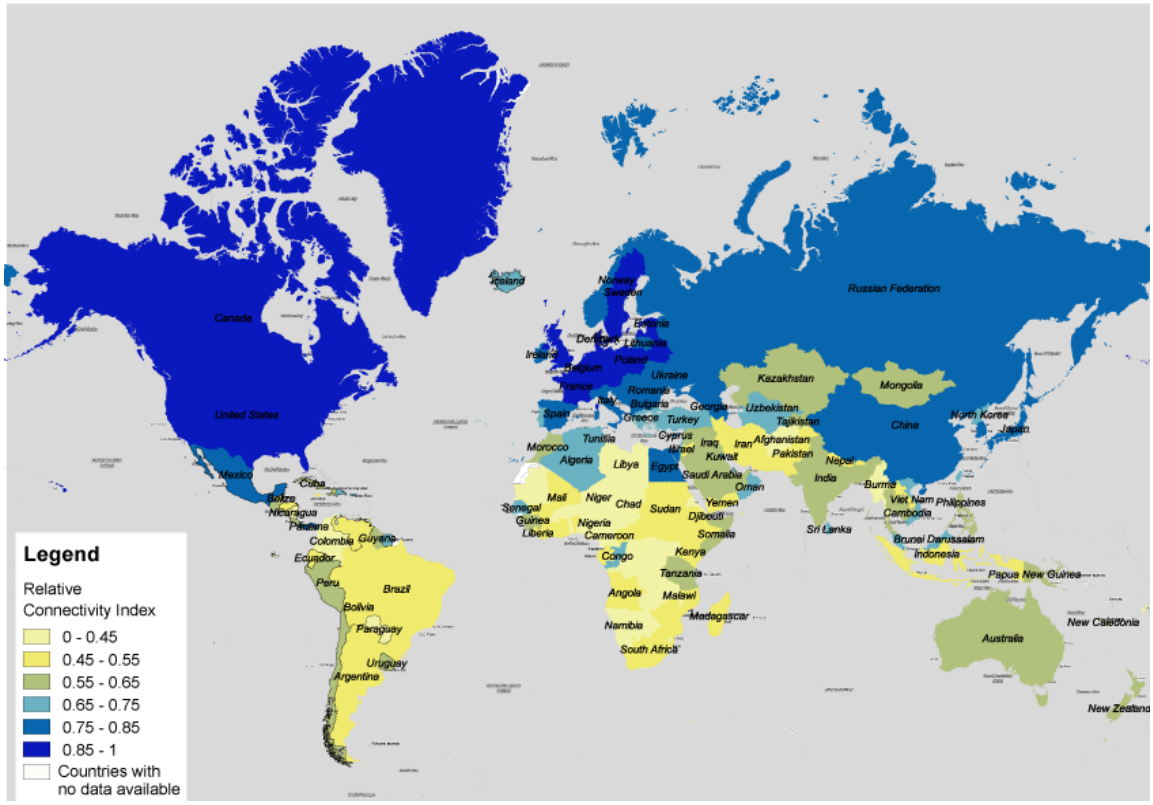
The increased trans-Eurasian overland transit, with over 6 000 trains carrying goods across the Eurasian continent since 2011, could be an important turning point for Central Asia and the Caucasus towards greater trade integration (AIIB, 2019[8]). Given that in recent years China has established itself 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[4]). 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[4]).

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[3]).

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[9]). 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[10]).

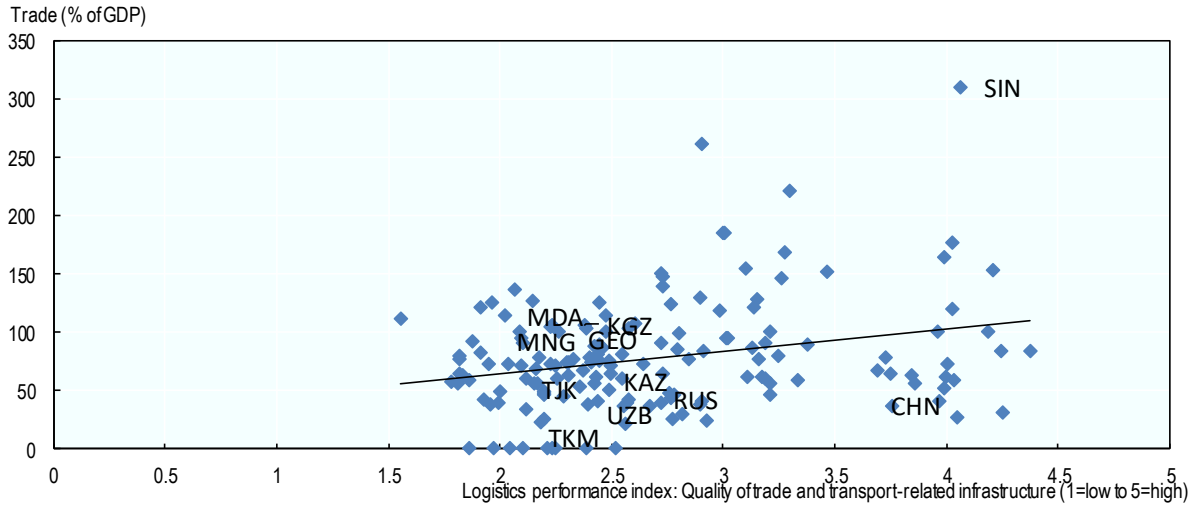
Figure 1.1. Global connectivity

Access to global GDP (%)



Note: The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.
Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".
Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.
Source: Based on the ITF Freight Model. ITF (2019[11]), *ITF Transport Outlook* 2019, OECD Publishing, Paris, https://doi.org/10.1787/transp_outlook-en-2019-en

Figure 1.2. Logistics costs and trade openness

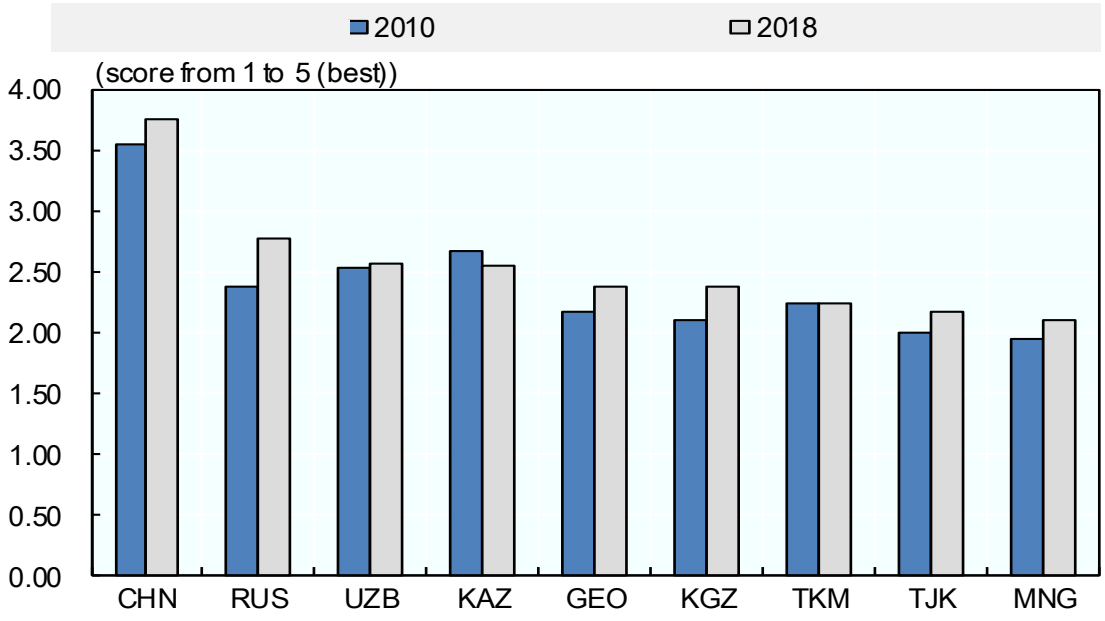


Source: World Bank (2018[12]), *Logistics Performance Index* (database), https://lpi.worldbank.org/international/aggregated-ranking; World Bank (2019[13]), *World Development Indicators (database)*, World Bank, https://data.worldbank.org/

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))



Source: World Bank (2018[12]), *Logistics Performance Index* (database), https://lpi.worldbank.org/international/aggregated-ranking

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

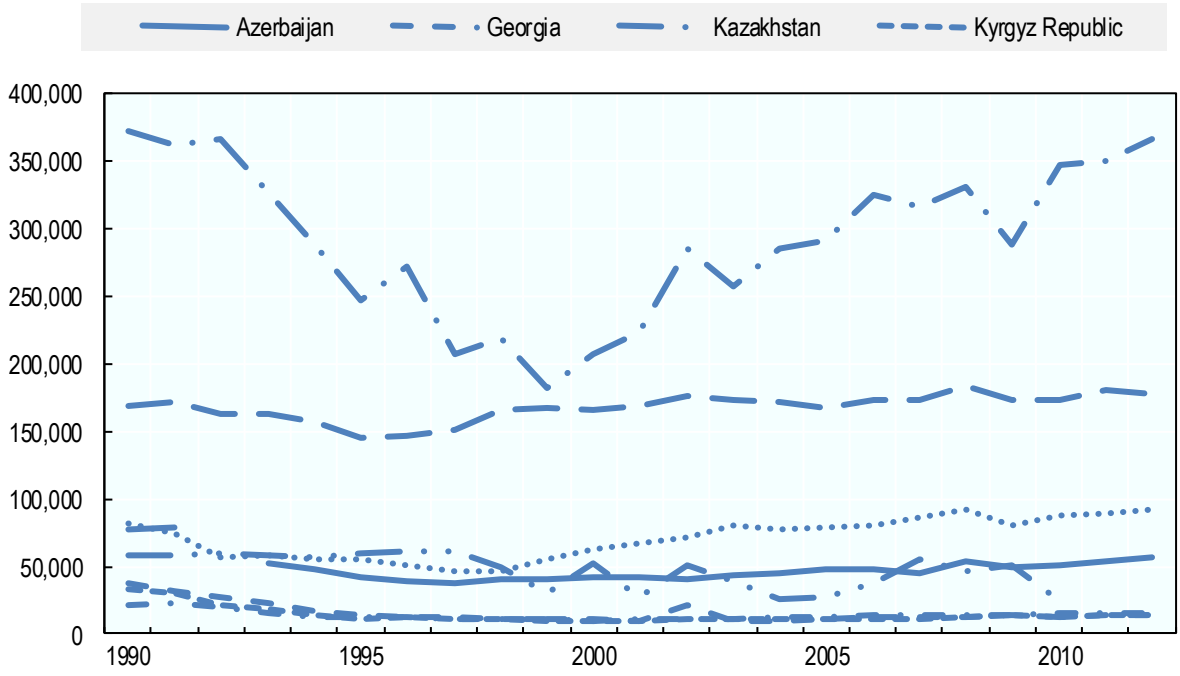
	Azerbaijan	Georgia	Kazakhstan	Kyrgyz Republic	Mongolia	Tajikistan	Turkmenistan	Uzbekistan
Energy								
Electricity production from coal sources (% of total) 2015	0	0	71.6	13.2	92.7	1.5	0	4.1
Electric power transmission and distribution losses (% of output) 2014	14	6	7	24	15	17	12	9
Quality of electricity supply (1-7 (best), WEF 2017-2018	5.5	5.0	4.6	3.6	4.0	3.7	N/A	N/A
Water and sanitation								
Improved water source (% of population with access) 2015	87	100	92.9	90	64.4	73.8	60.4*	87.3**
Improved sanitation facilities (% of population with access)	89.3	86.3	97.5	93.3	59.7	95	N/A	100
Transport								
Quality of roads, 1-7 (best), WEF 2017-2018	4.8	3.8	2.9	2.7	3.1	4.1	N/A	N/A
Quality of railroad infrastructure, 1-7 (best), WEF 2017-2018	4.7	3.8	4.1	2.4	2.8	3.7	N/A	N/A
Quality of port infrastructure, 1-7 (best), WEF[1] 2017-2018	4.7	4.1	3.2	1.4	1.4	2.0	N/A	N/A
Quality of air transport infrastructure, 1-7 (best), WEF 2017-2018	5.6	4.3	4.0	3.1	3.2	4.3	N/A	N/A

Notes: *Data for Turkmenistan is available from 2006. **Data for Uzbekistan is available from 2012.
Source: World Bank (2019[13]), IBRD (2019[14]), World Economic Forum (2017[15]).

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[16]). 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.

Figure 1.4. GHG emissions by country, 1990-2012

In ktCO2e



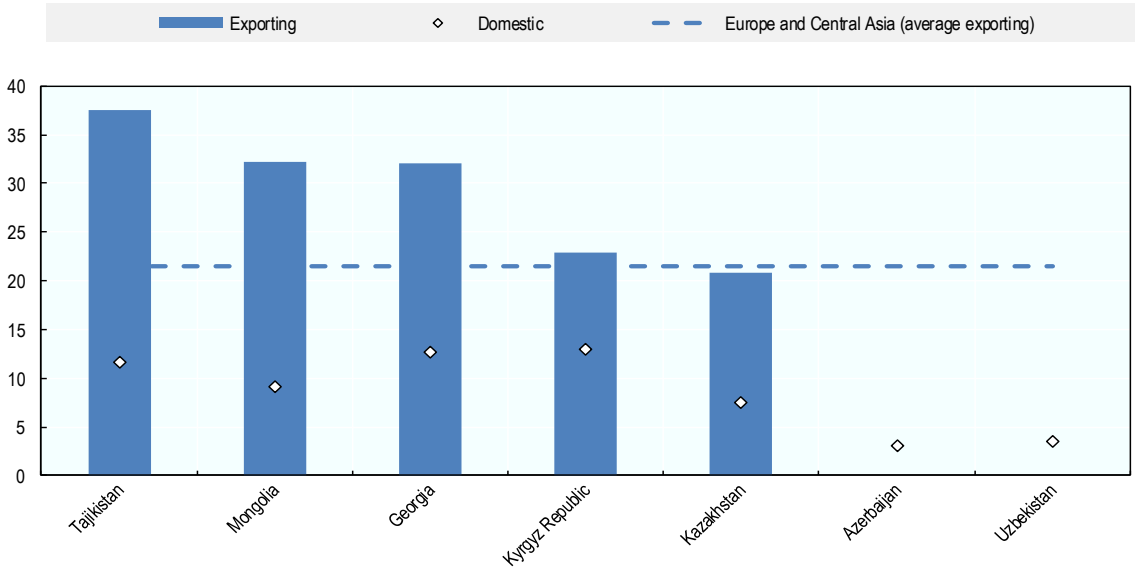
Source: World Bank (2019[13]), *World Development Indicators (database)*, World Bank, https://data.worldbank.org/indicator/EN.ATM.GHGT.ZG

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.
Source: World Bank (World Bank, 2013[17]), "Enterprise Surveys", https://www.enterprisesurveys.org/

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[2]). A number of sub-regional projects, programmes and strategies intend to increase connectivity and spur competitiveness (see Table 1.3) (OECD, 2018[18]). 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[18]).

Table 1.3. Regional Transport Corridors in Central Asia

Project name	Amount of investment (in USD billion)	Countries or continents covered
Belt and Road Initiative (BRI)	900 – 8 000	Europe, Asia, Africa
The Central Asia Regional Economic Cooperation (CAREC) Program	31.5	Afghanistan, Azerbaijan, People's Republic of China, Georgia, Kazakhstan, the Kyrgyz Republic, Mongolia, Pakistan, Tajikistan, Turkmenistan, Uzbekistan.
Transport Corridor Europe Caucasus Asia (TRACECA)	0.16	Armenia, Azerbaijan, Bulgaria, Georgia, Kazakhstan, the Kyrgyz Republic, Iran, Moldova, Romania, Turkey, Ukraine, Uzbekistan, Tajikistan, Turkmenistan, plus the member states of the European Union.
Trans-Asian Railway (TAR)	75.6	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.

Source: ITF (2019[3]), "Enhancing Connectivity and Freight in Central Asia", International Transport Forum Policy Papers, No. 71, OECD Publishing, Paris.

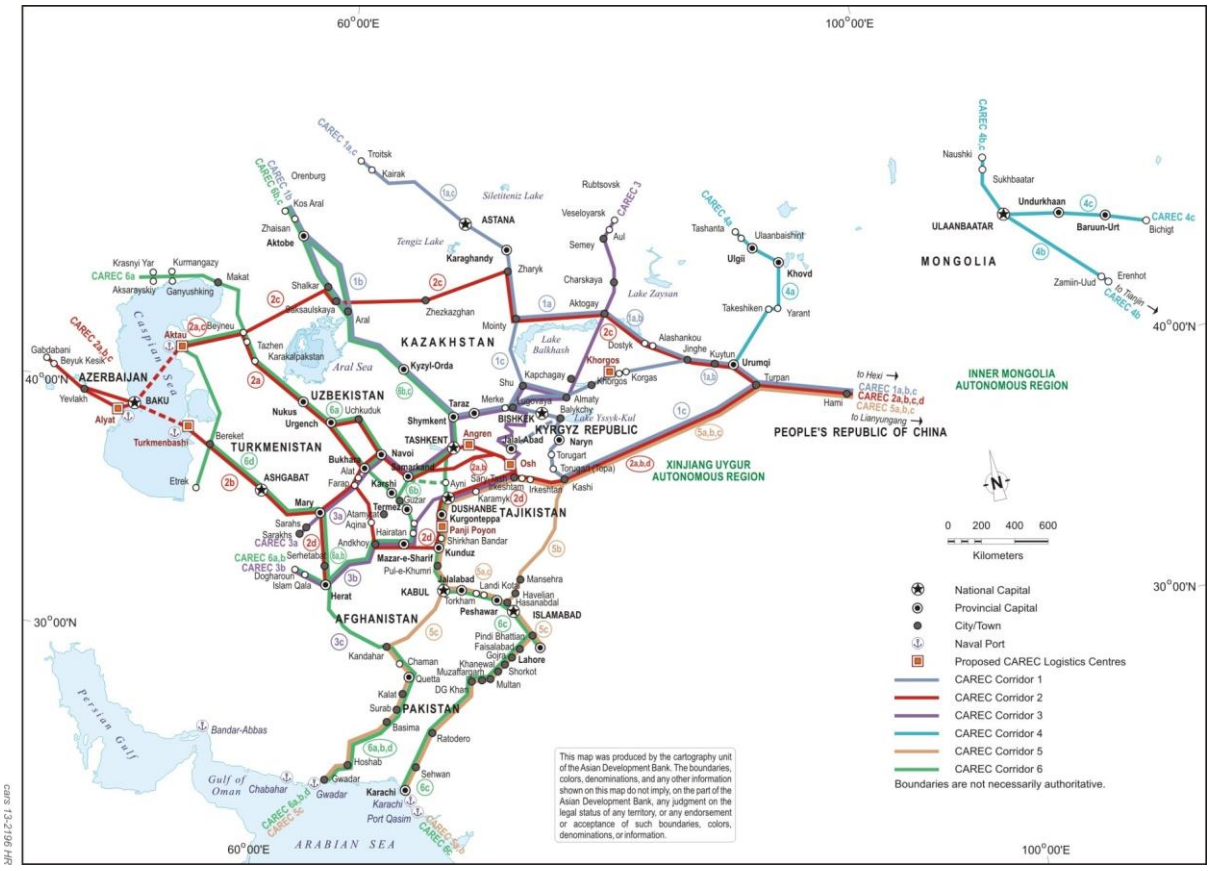
The most comprehensive of these strategies, the CAREC programme, is a USD 31.5 billion initiative led by the Asian Development Bank that focuses on identifying and developing six main transport and trade corridors for long-term investments (see Figure 1.6). Its goal is similar to other regional initiatives 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[19]). Yet, compared to other regions in Asia, CAREC's recipient countries remain less integrated in terms of trade and investment (AIIB, 2019[8]).

The six CAREC corridors are:

- *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[20])

Figure 1.6. Map of CAREC Economic Corridors

Six Central Asia Regional Economic Cooperation Corridors



Source: CAREC (n.d.[21]), "CAREC Program", Central Asia Regional Economic Cooperation, 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[22]). 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[23]). As part of the BRI, there are six proposed overland economic corridors:

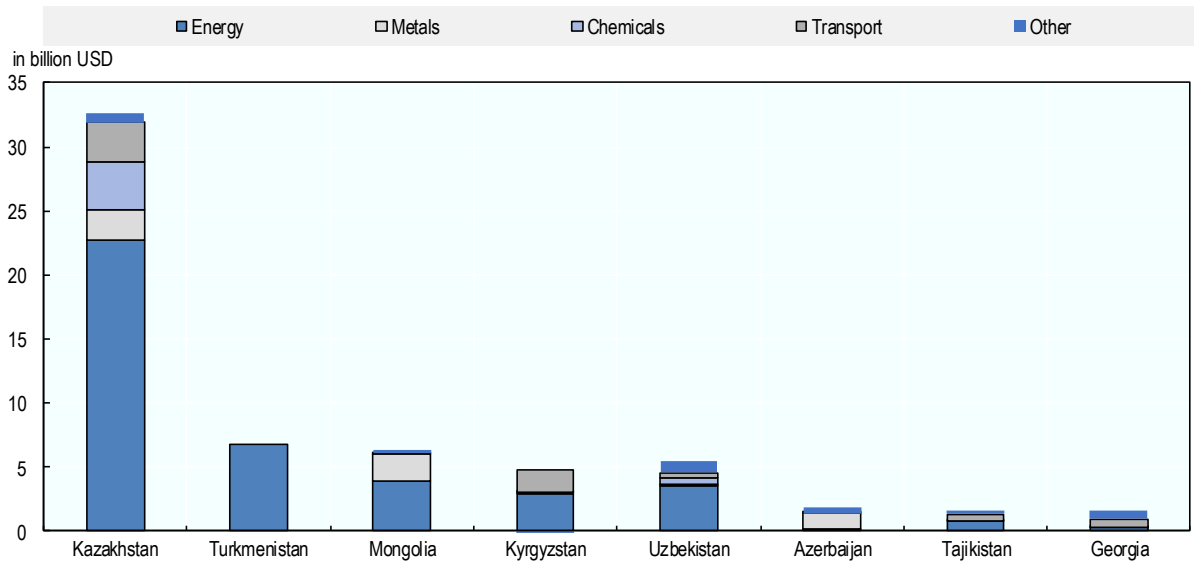
1. China–Mongolia–Russia Economic Corridor
2. New Eurasian Land Bridge
3. China–Central Asia–West Asia Economic Corridor

4. China–Indochina Peninsula Economic Corridor
5. China–Pakistan Economic Corridor
6. Bangladesh–China–India–Myanmar Economic Corridor

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 1.7). 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 1.7. Chinese investments across Central Asia and the Caucasus, by sector

In USD billion



Note: Other includes projects in agriculture; tourism; real estate (construction and property); industry; banking; and timber.
Source: American Enterprise Institute (2019[24]), "China Global Investment Tracker", http://www.aei.org/china-global-investment-tracker/

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

	Azerbaijan	Georgia	Kazakhstan	Kyrgyz Republic	Mongolia	Tajikistan	Turkmenistan	Uzbekistan
Real GDP growth (year-on-year change, 2019)	1.4%	4.6%	3.2%	3.8%	6.3%	5%	6.3%	5.1%
GDP per capita (USD, current price, 2018)	4 721	4 345	9 331	1 220	4.104	827	6 967	1 532
FDI, net inflows (as % of GDP)	3.0%	7.3%	0.1%	-1.4%	16.7%	2.9%	6.1%	1.2%
Ease of Doing Business Rank	25	6	28	70	74	60	N/A	76
Number of procedures to start a business (women), 2019	3	1	5	4	8	4	N/A	3
Number of days to start a business (women), 2019	3.5	2	5	10	11	11	N/A	4
Ability to trade across borders across Borders (0 to 100 best performance), 2019	77.4	90.3	70.36	80.74	66.89	59.06	N/A	49.79
Transparency, accountability and corruption in the public sector rating (1= most corrupt, 6 = least corrupt, 2017)	2.5	3.5	N/A	3	3.5	2.5	N/A	2

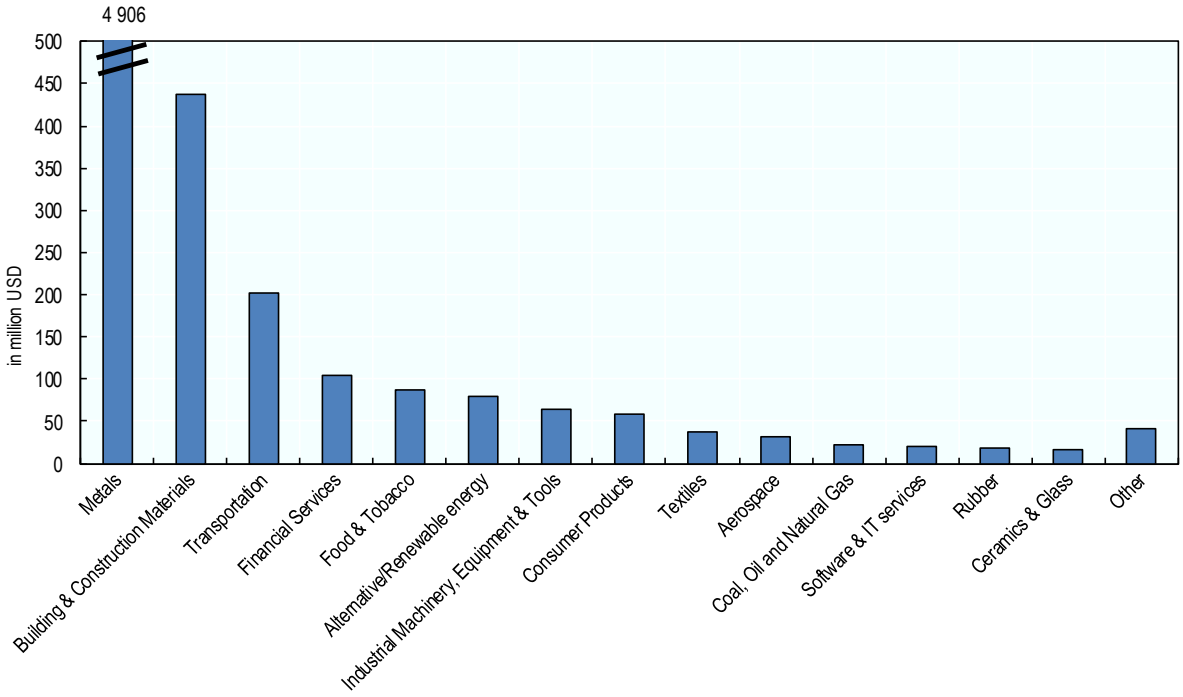
Source: World Bank (2019[13]), IBRD (2019[14]), World Economic Forum (2017[15]).

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 disproportionally 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 1.8). 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 1.8. Greenfield FDI in Central Asia and the Caucasus by economic activity, 2003-2017



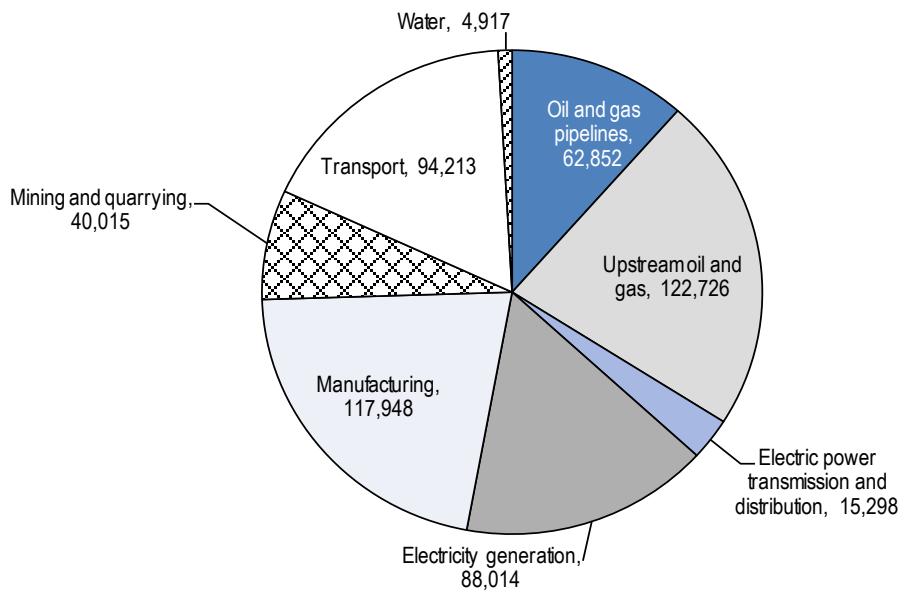
Note: Other includes Pharmaceuticals; Non-Automotive Transport OEM; Leisure & Entertainment; Rubber; Beverages; Software & IT services; Electronic Components; Automotive Components; Aerospace; Engines & Turbines; Healthcare; Business Machines & Equipment; Paper, Printing & Packaging; Medical Devices; Biotechnology; Semiconductors; Wood Products.
Source: OECD based on fDi Markets (2019[26]), *fDi Markets: the in-depth crossborder investment monitor (database)*, fDi Markets, https://www.fdimarkets.com/

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[1] 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 1.9). 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 1.9. Investment projects in Central Asia and the Caucasus, by sector

In USD million

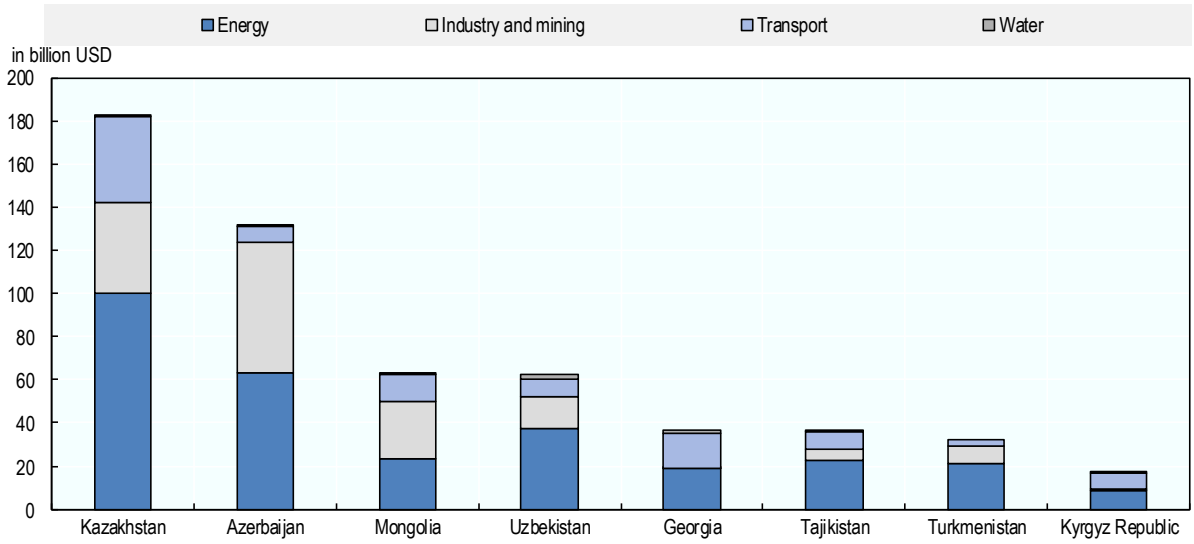


Note: *Electricity generation* projects include natural gas-fired electric power plants, wind farms, solar plants, hydroelectric power plants, and coal-fired electric power plants. Electric Power Transmission and Distribution projects include district heating projects, central transmission and distribution 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 both attract 11% of total investments, followed by Georgia (7%), Tajikistan and Turkmenistan (6% each), and the Kyrgyz Republic (3%).

Figure 1.10. Investment projects planned and under construction in Central Asia and the Caucasus countries, by sector

In USD billion



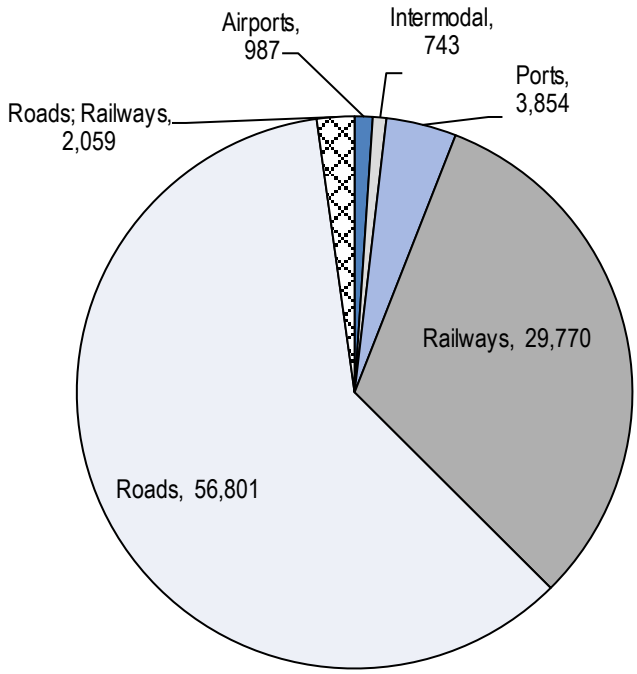
Source: OECD analysis based on accessed databases as of June 2019.

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 1.11). 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[8]). 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 1.11. Transport projects planned and under construction in Central Asia and the Caucasus, by sub-sector

In USD million



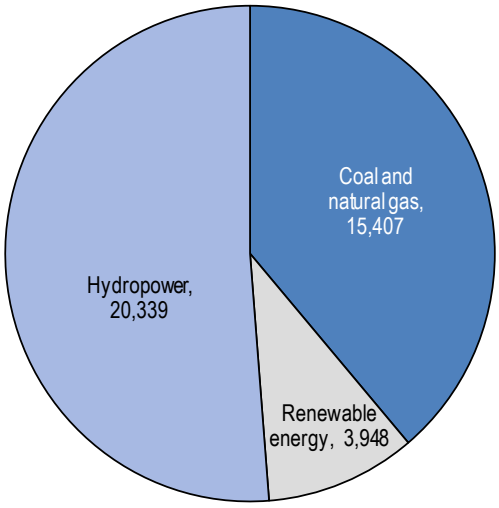
Note: Intermodal projects include the development of logistics centres.
Source: OECD analysis based on accessed databases as of June 2019

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 1.12). 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 1.12. Electricity generation projects by fuel

In MW



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

Notes

[i] Energy projects include oil and gas pipelines, upstream oil and gas projects, electric power transmission and distribution projects, as well as electricity generation projects.

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Chapter 2. Investment in sustainable infrastructure in Azerbaijan

This chapter describes sustainable infrastructure planning in Azerbaijan and presents current trends in investment in large-scale infrastructure projects. It compares Azerbaijan's infrastructure plans in the energy, transport, industry and water sectors against its international commitments under the Paris Agreement on climate change and the Sustainable Development Goals (SDGs). The chapter also explores Azerbaijan's strategic documents for long-term economic development, sectoral development and the environment, including those related to climate change mitigation and adaptation. It identifies misalignments between stated goals and observed investment flows and provides recommendations to improve strategic planning for sustainable infrastructure.

Overview

Azerbaijan is an upper-middle income country in the south Caucasus. Its economy is driven by fossil fuel extraction: petroleum products account for over 90% of Azerbaijan's exports, and the oil and gas industry makes up between 33% and 50% of Azerbaijan's GDP depending on oil prices. In recent years, Azerbaijan has significantly improved its investment climate by strengthening the institutional, regulatory and operational environment for companies to operate in the country: the country ranked 25th is the Ease of Doing Business in 2019, compared to 57th in 2018. The stated objective of the country is to diversify foreign direct investments away from coal, oil and natural gas (50% of FDI between 2003 and 2017) towards infrastructure and industry (mining, metallurgy, cement).

While Azerbaijan's infrastructure is relatively high quality compared to other Eurasian countries and upper-middle income countries as a whole, it ranks poorly in the World Bank's Logistics Performance Index (123rd out of 167 countries) due to poor "soft" trade infrastructure, such as the competence of transport operators and customs breakers and the quality of logistics services. Azerbaijan's road and rail networks are in need of modernisation and increased spending on maintenance. Cross-border connectivity projects are top priorities for the government and make up most of Azerbaijan's transport investments, but focusing more on secondary and local roads could improve domestic connectivity and bring down travel costs. The inland transport modal split has heavily shifted to road in the last decade, representing 71% of freight transport and 98% of passenger transport in 2015.

Although the government of Azerbaijan identifies economic diversification and strengthening of the 'non-oil sector' as key priorities in its development strategy *Azerbaijan 2020: A Look to the Future*, many of its investments support the continued dominance of oil and gas in the energy sector and economy more widely. For instance, current investment plans in wind projects, while significant, are dwarfed by large-scale upstream oil and gas projects and pipelines. Azerbaijan currently lacks a mid-century coherent strategy with a strong environmental focus and, crucially, a sufficiently long time horizon to evaluate the synergies and trade-offs associated with different infrastructure investments. Azerbaijan's recent institutional changes have weakened the position of transport and energy, which are key infrastructure sectors, through its merger of the Ministry of Transport with the Ministry of Communication and High Technologies in 2017 and the dissolution of the State Agency for Alternative and Renewable Energy Sources in 2019.

2.1 State of play: economy, investment and climate change in Azerbaijan

Economy and trade

Table 2.1. Key indicators on Azerbaijan's economy

Population (2018)	9 942 334
Urbanisation rate (2018)	56%
Annual population growth (2018)	0.9%
Surface area	86 600 km^2
GDP (USD, current price, 2018)	46 940 million
GDP per capita (USD, current price, 2018)	4 721
Real GDP growth (year-on-year change, 2018)	1.4%
Inflation (average consumer price, y-o-y change, 2018)	1.9%
Exports of goods and services (% of GDP, 2018)	54.3%
Imports of goods and services (% of GDP, 2018)	37.7%
FDI, net inflows (% of GDP, 2018)	3.0%
General government net lending/borrowing (% of GDP, 2019)	4.4%
Unemployment (% of total labour force, 2018)	5.2%
Remittances (% of GDP, 2018)	2.6%
Transparency, accountability and corruption in the public sector rating (1= most corrupt, 6 = least corrupt, 2017)	2.5

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

Azerbaijan is an upper-middle income country in the Caucasus. Its population, the largest in the south Caucasus, has grown steadily at annual rates of about 0.9%. Unlike in neighbouring Armenia and Georgia, Azerbaijan's population did not decline following the breakup of the Soviet Union, nor has the country ever experienced non-positive annual population growth rates.

The economy of Azerbaijan, on the other hand, followed a similar trajectory to other former Soviet Union countries. It shrank to less than half of its pre-independence levels, from USD 22.7 billion in 1990 to USD 9.5 billion in 1995, and then slowly recovered throughout the late 1990s and early 2000s. Its GDP surpassed its 1990 levels in 2005 and by 2017 was 56% larger than before independence.

Azerbaijan's territory consists of two unconnected areas separated by Armenia. Larger portion of Azerbaijan's territory is the only part of the southern Caucasus with access to the Caspian Sea, while the Nakhchivan Autonomous Republic, the country's exclave, is landlocked between Armenia, Iran and Turkey. Following years of armed conflict, the Nagorno-Karabakh region of western Azerbaijan bordering Armenia declared its independence in 1991 as the Republic of Artsakh (or the Nagorno-Karabakh Republic), and in 1994 Armenia, Azerbaijan and representatives from the breakaway region signed a ceasefire agreement. To date, no UN member state has recognised the breakaway region's independence. As a result of the conflict, the border between Armenia and Azerbaijan is closed.

Azerbaijan's economy, unlike other countries in the present study except Turkmenistan, depends more heavily on industry and construction (which accounted for 52.2% of GDP in 2018) than on services (35.2%) and agriculture (5.3%). The share of agriculture in Azerbaijan's economy is the second lowest in the region after Kazakhstan (4.4%) (World Bank, 2019[1]).

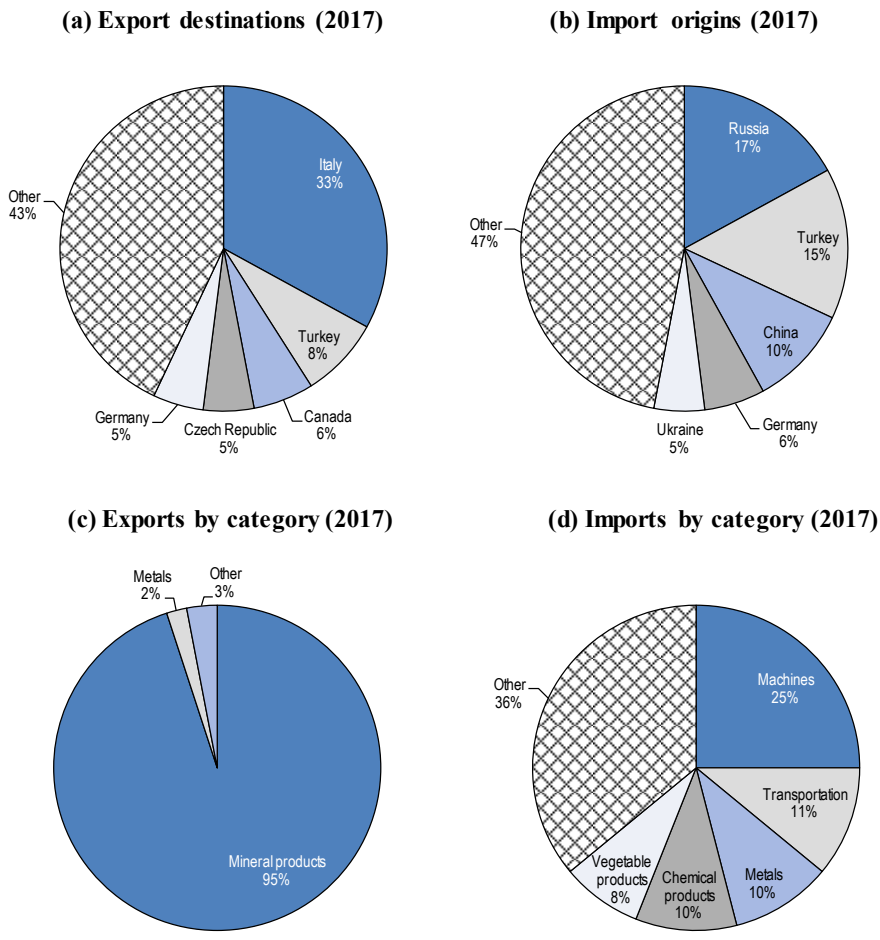
Trade

Azerbaijan is an observer, not a member, of the World Trade Organisation. It is not a member of the Eurasian Economic Union, but it is a target country of the European Union's European Neighbourhood Policy under the Eastern Partnership (EaP) policy initiative. These initiatives aim to deepen EU-Azerbaijan relations through actions focusing on economic development, governance, connectivity and people-to-people contact (European Commission, 2019[3]). Its trade relations with the EU have been governed by a Partnership and Cooperation Agreement since 1999, and negotiations began in 2017 to establish a more comprehensive trade agreement (European Commission, 2019[4]).

The oil and gas industry produces all but a small fraction of Azerbaijan's exports (see Figure 2.1(c), where they are classified as 'mineral products'). The country's most important export by far is crude petroleum (82% of exports), followed by petroleum gas (9.1%) and refined petroleum (2.3%). Other than limited exports of metal, the share of other exports is very small. While Azerbaijan exports mostly raw hydrocarbon resources, it imports primarily finished manufactured goods and consumer goods. Its main imports are machinery (25%) and vehicles (11%, mostly cars which account for 3.9% of imports) as well as metals (10%), chemical products (10%) and vegetables (8%) (see Figure 2.1(d)). After cars, Azerbaijan's second most important imported product is refined petroleum.

Azerbaijan's main export market is the European Union (59.2% of exports), especially Italy (33%), the Czech Republic (5.4%), Germany (4.9%) and Portugal (4.7%) (see Figure 2.1(a)). Major non-EU export destinations include Turkey (8%) – with which Azerbaijan has close historical, cultural and linguistic ties, Canada (6%) and Israel (4.5%). Azerbaijan's most important export destinations within the former Soviet Union are its neighbour Georgia (3.8%) and Ukraine (2.5%), while Russia accounts for just 1.4%. The European Union as a bloc is Azerbaijan's most important source of imports (25.5%), with Germany (5.6%), Italy (3.6%), the United Kingdom (3.3%) and the Netherlands (2%) as the sources of most of Azerbaijan's EU imports. Azerbaijan's neighbours, the Russian Federation (17%) and Turkey (15%), are the most important countries for Azerbaijan's imports, followed by the People's Republic of China (9.7%) (see Figure 2.1(b)). Other than the Russian Federation, Ukraine (5.1%), Georgia (3.2%) and Kazakhstan (1.6%) are the former Soviet countries that export the most to Azerbaijan. Azerbaijan's *Strategic Road Map on the Development of Logistics Outcomes* sets goals for increasing trade volumes by 2020 with specific regions and countries compared to 2015 (see section 2.3 on Azerbaijan's key strategic documents). Azerbaijan aims to increase trade via the Black Sea with Central Asia by 40% and with Iran by 25%. It also aims to increase transit volumes for various routes: between Central Asia and Europe by 25%, between China and Europe by 3% and between the Russian Federation and Iran by 40% (President of Azerbaijan, 2016[5]).

Figure 2.1. Trade of Azerbaijan



Source: Observatory of Economic Complexity (2017[6]), *Azerbaijan: Exports, Imports and Trade Partners*, Observatory of Economic Complexity, https://atlas.media.mit.edu/en/profile/country/aze/

Investment climate

In recent years, Azerbaijan has taken significant reforms to improve its investment climate by strengthening the institutional, regulatory and operational environment for companies to operate in the country. Such reforms and programmes are part of government's efforts to develop industry and improve the image of the country worldwide (OECD, 2019[7]). According to the World Bank's Doing Business Report (2019[8]). The country has made significant improvements in dealing with construction permits, getting electricity, registering property, getting credit, protecting minority investors, paying taxes, trading across borders, and resolving insolvency. Such reforms have led to a significant improvement in the country's overall ease of doing business, which in 2019 was ranked 25th across 190 countries compared to 57th in 2018, making it one of the top 10 performers worldwide (OECD, 2019[7]).

A recent OECD survey in Azerbaijan also demonstrates positive business perceptions of the reforms in Azerbaijan, with over 50% of the businesses considering all reforms "good" or "very good" (OECD, 2019[7]). The reforms that have been well-received by businesses

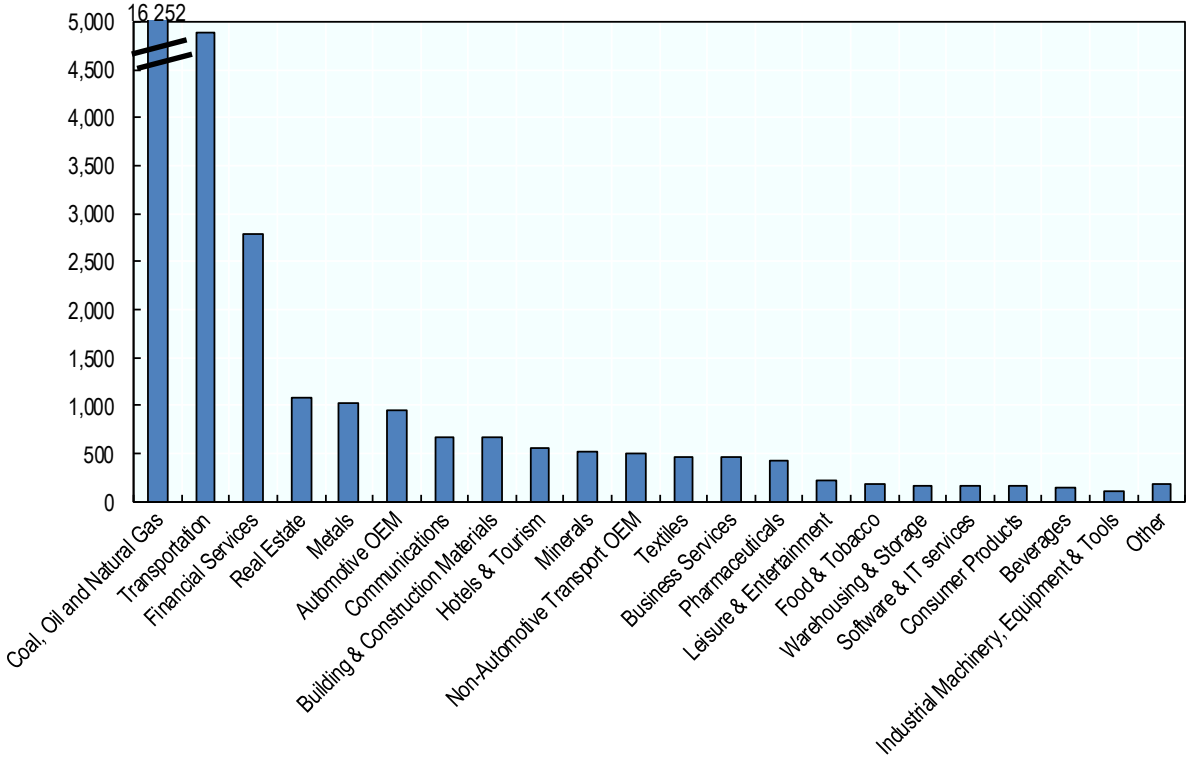
include the suspension of business inspections (with 86% of businesses responding good or very good), as well as the online licensing (82%), and visa services (77%). Other initiatives such as the simplification of the tax system and the simplification of the customs system have also been perceived as positive by businesses in Azerbaijan.

Yet, despite such reforms in improving the investment climate, Azerbaijan still needs to improve its ability to foster skills development, promote competition among firms and reduce uncertainty. Despite the improved regulatory framework, the current business environment still deters entry of new firms and the expansion of existing businesses (EBRD, 2019[9]). According to some companies surveyed by the OECD, there is volatility in the sectors targeted by the government for growth, which creates uncertainty for businesses and hampers the effectiveness of the initiatives (OECD, 2019[7]). Companies would welcome greater consistency and long-term commitment across the reform programme.

International data on announced greenfield FDI projects offer insights on cross-border investment by economic activity in Azerbaijan. Between 2003 and 2017, the economy attracted over USD 32.7 billion of greenfield FDI projects, 50% of which was directed towards the coal, oil and natural gas sectors (or USD 16.3 billion) (see Figure 2.2). Infrastructure-related investments, particularly in the transport sector attracted close to USD 5 billion (or 15% of total greenfield FDI), which is relatively high compared to other countries in the region. This is in line with the government's current priorities to develop new trade routes and transport corridors, including the establishment of the Alat free trade zone, the development of the international sea trade port, and the Baku-Tbilisi-Kars railway, which are expected to further attract FDI into the country (German-Azerbaijan Chamber of Commerce, 2018[10]). Other sectors that attracted greenfield FDI are financial services (USD 2.8 billion), real estate and metals (both with around USD 1 billion). In general, the government has acknowledged the need to diversify its FDI away from coal, oil and natural gas and increase the share of non-oil FDI from 2.6% of GDP in 2017 to 4% by 2025 as stated in the Strategic Road Map on the National Economy (Center for Analysis of Economic Reforms and Communication, 2017[11]).

Figure 2.2. Greenfield FDI in Azerbaijan by economic activity, 2003-2017

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



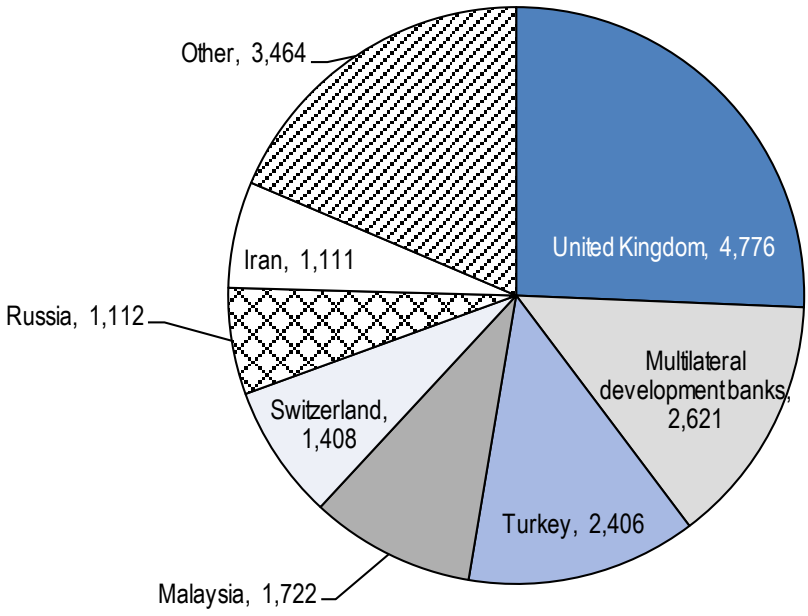
Note: Other includes Plastics, Aerospace, Consumer Electronics, Electronic Components, Chemicals, Medical Devices, Business Machines & Equipment, Paper, Printing & Packaging.
Source: OECD based on fDi Markets (2019[12]), *fDi Markets: the in-depth crossborder investment monitor (database)*, fDi Markets, https://www.fdimarkets.com/

The European Union (and particularly the United Kingdom) is the most important source of foreign direct investment (FDI) in Azerbaijan, providing 30% (and 25.7%) of foreign investment in fixed capital between 2009 and 2017 (see Figure 2.3). The United Kingdom's interest in Azerbaijan centres on the country's oil and gas industry, in which BP actively participates. Collectively, multilateral development banks invested a further 14%, surpassing the investments of Azerbaijan's neighbour Turkey (12.9%). Azerbaijan's other important investors are geographically diverse: Malaysia (9.3%), Switzerland (7.6%), the Russian Federation (6%), Iran (6%), Japan (5.3%) and the United States of America (4.5%). Beyond the Russian Federation, the former Soviet Union countries are not large investors.

The majority of Azerbaijan's public debt (over 70%) is denominated in foreign currencies, and the ratio of debt to GDP is rising (from 11% in 2014 to as high as 38% in 2016). The Azerbaijani currency, the *manat*, depreciated by 60% against the US dollar in 2014 and could face further pressure to depreciate, worsening Azerbaijan's foreign-denominated debt situation. Given the volatility of currency exchange rates and the market value of Azerbaijan's primary exports, the structure and size of Azerbaijan's debt could become unsustainable if faced with adverse shocks (IMF, 2016[13]).

Figure 2.3. FDI in Azerbaijan by source country, 2009-2017

Azerbaijani manat (AZN) million



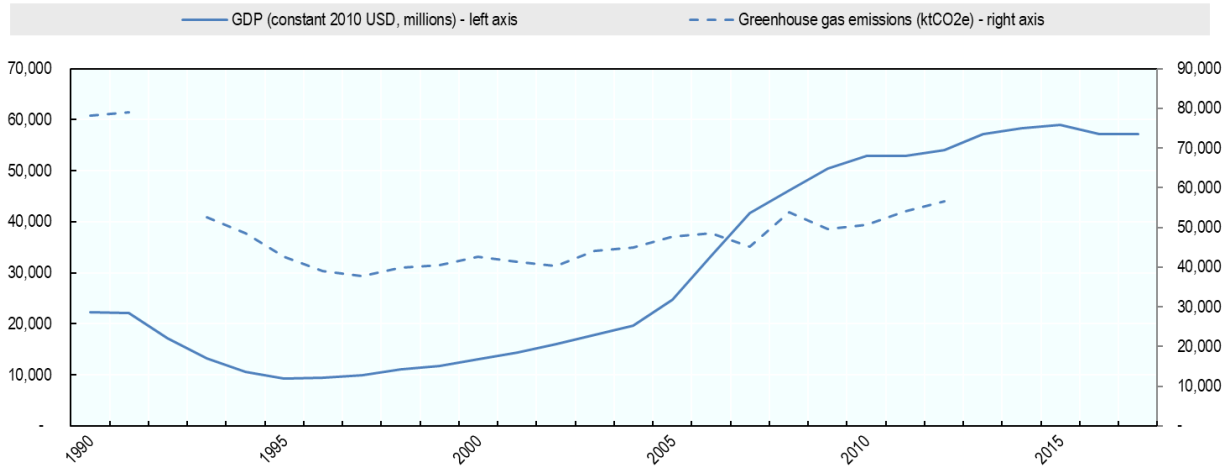
Source: The State Statistical Committee of the Republic of Azerbaijan (2018[14]), *Foreign investment directed to fixed capital by foreign countries*, The State Statistical Committee of the Republic of Azerbaijan, https://www.stat.gov.az/source/construction/en/020en.xls

Climate change

Given the country's relatively small size, its total emissions amount to only 0.1% of total global greenhouse gas (GHG) emissions. Azerbaijan's GHG emissions and GDP both halved in the 1990s, following the breakup of the Soviet Union. Its GHG emissions fell from 78 $MtCO_2e$ in 1990 to 38 $MtCO_2e$ in 1997, while its GDP declined (see Figure 2.4). Over the past two decades, Azerbaijan's emissions have slowly increased but, as of 2012, they have not yet surpassed their 1990 levels. Azerbaijan's economy, on the other hand, has expanded rapidly since the late 1990s; by 2017, it was 2.5 larger than before independence. Consequently, the GHG intensity of Azerbaijan's economy decreased by more than half, from 3.5 $kgCO_2e$ per USD (in constant 2010 dollars) in 1990 to 1 $kgCO_2e$ per USD of GDP by 2012. While this figure is the lowest GHG intensity of the countries analysed in the present study, it is significantly higher than the OECD average (0.35 $kgCO_2e$ per USD in 2012) (World Bank, 2019[1]).

Azerbaijan's per capita emissions have also dropped from 10.9 tCO_2e in 1990 to 6.1 tCO_2e. While this figure is less than a third of other hydrocarbon-dependent economies like Kazakhstan and the Russian Federation and less than half the OECD average of 12.9 tCO_2 per capita, it is considerably higher than its neighbour Georgia's per capita emissions of 3.8 tCO_2e (World Bank, 2019[1]).

Figure 2.4. GHG emissions and GDP of Azerbaijan, 1990-2017



Source: World Bank (2019[1]), *World Development Indicators (database)*, World Bank, https://data.worldbank.org/indicator/EN.ATM.GHGT.ZG

Energy (including fuel combustion for transport) accounts for the majority of Azerbaijan's greenhouse gas emissions, at 75.3% in 2012. While this is a sizeable share, it is smaller than in 1990 when energy accounted for 87.2% of total emissions. Azerbaijan's energy-related emissions were 38.5% lower than in 1990, while all other sources have gradually increased emissions since independence. Agriculture accounted for 13.6% of emissions in 2012, while industrial processes made up 5.8% and waste 4.8% (Ministry of Ecology and Natural Resources Republic of Azerbaijan, 2015[15]).

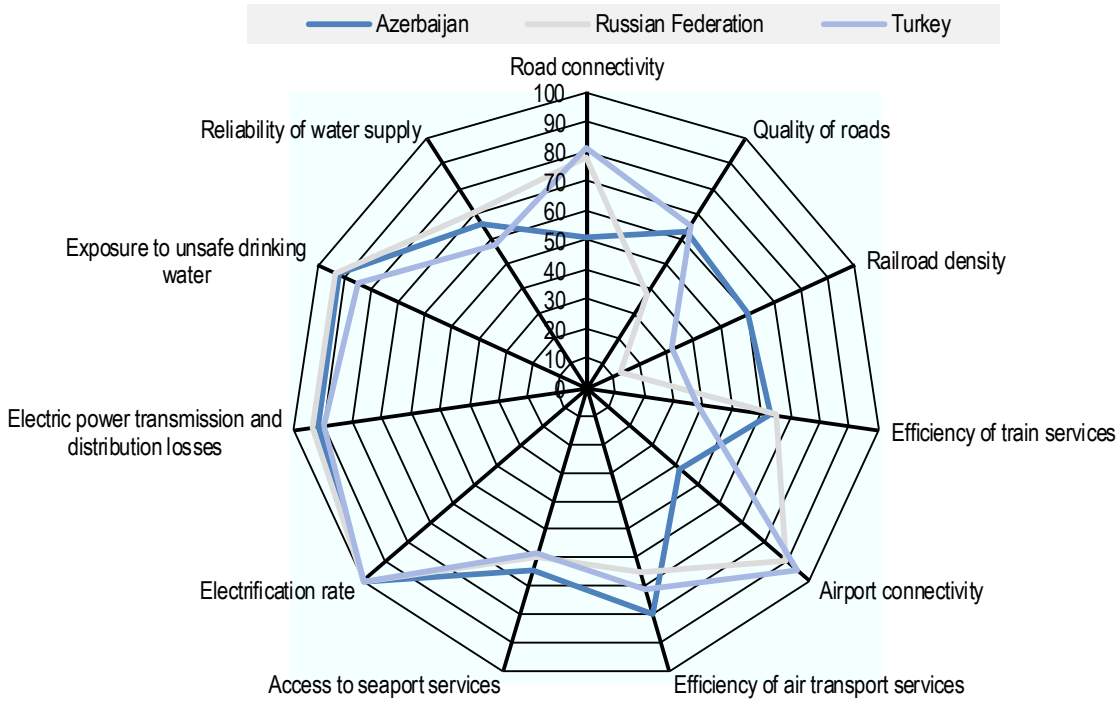
Current trends of decreasing precipitation and rising temperatures linked to climate change are already affecting Azerbaijan's agriculture industry, which employs 38% of the population. Pastureland and vital crops, such as wheat, cotton and grapes, are particularly vulnerable to these changes. The country already faces a shortage of water to meet domestic needs, and projected decreases in water resources (rivers, lakes, reservoirs and glaciers) are set to deepen the deficit. The number of days with maximum temperatures exceeding 35 degrees Celsius in Azerbaijan has increased rapidly, from 3 in the period 1961-1990 to 16 in the 2000s. The capital Baku in 2010 registered 44 days of temperatures over 35 degrees Celsius resulting in increased sunstroke incidence and hospitalisation rates. Climate impacts on economic activity and human wellbeing are projected to worsen without adequate adaptation measures (Ministry of Ecology and Natural Resources Republic of Azerbaijan, 2015[15]).

2.2 Azerbaijan's infrastructure needs and current plans

Azerbaijan's infrastructure is relatively high quality in comparison to Eurasian countries and upper-middle income countries as a whole. Its infrastructure matches or exceeds the performance of the Russian Federation and Turkey's infrastructure on most indicators, with the notable exceptions of airport and road connectivity (see Figure 2.5). However, Azerbaijan's capital stock per capita is one of the lowest in the former Soviet Union, and much scope remains for increased infrastructure investment, particularly in modernising rail and improving irrigation as well as water supply and sanitation. Infrastructure service delivery varies considerably by region, with rural areas neglected in favour of the capital city region (World Bank, 2015[16]). Despite its relatively good infrastructure, Azerbaijan

ranks poorly in the World Bank's Logistics Performance Index (123rd out of 167 countries) due primarily to its 'soft' trade infrastructure, such as the competence and quality of its logistics services (World Bank, 2018[17]).

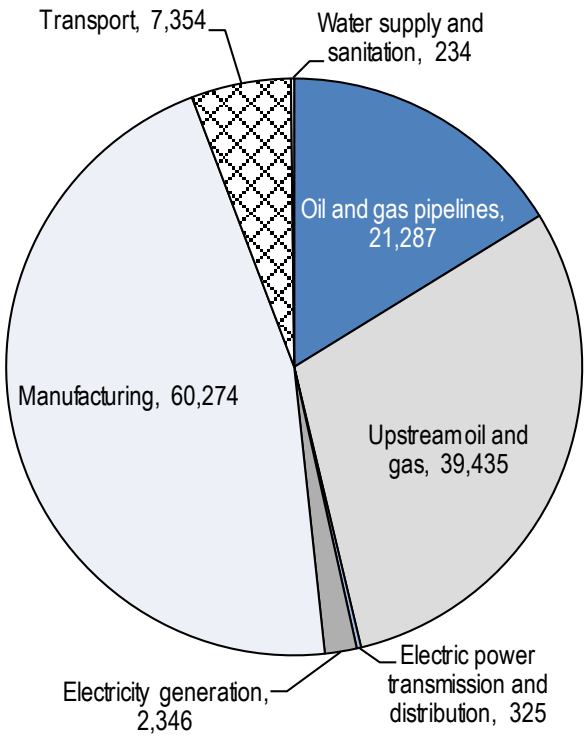
Figure 2.5. Quality of infrastructure in Azerbaijan



Source: World Economic Forum (2017[18]), *The Global Competitiveness Report 2017-2018*, World Economic Forum, http://www3.weforum.org/docs/GCR2017-2018/05FullReport/TheGlobalCompetitivenessReport2017%E2%80%932018.pdf

Out of the USD 131.4 billion of planned and under construction investment projects tracked, energy related projects account for the majority of investments, or USD 63.4 billion (48%) of total investments, followed by manufacturing projects (USD 60.2 billion or 46%) and transport (USD 7.5 billion or 6%) (see Figure 2.6). Water projects only account for 0.2%, or USD 234 million of total investments and they primarily relate to water supply and sanitation projects. Within energy investments, upstream oil and gas projects account for the majority of investments (over 62% or USD 39.4 billion of total energy projects), followed by large oil and gas pipeline projects (USD 21.2 billion or 34%) and electricity generation (USD 2.3 billion or 4%). Electric power transmission and distribution investments are limited to USD 325 million, and aim at upgrading the distribution network in secondary cities and rural areas (ADB, n.d.[19]).

Figure 2.6. Investment projects in Azerbaijan, by sector



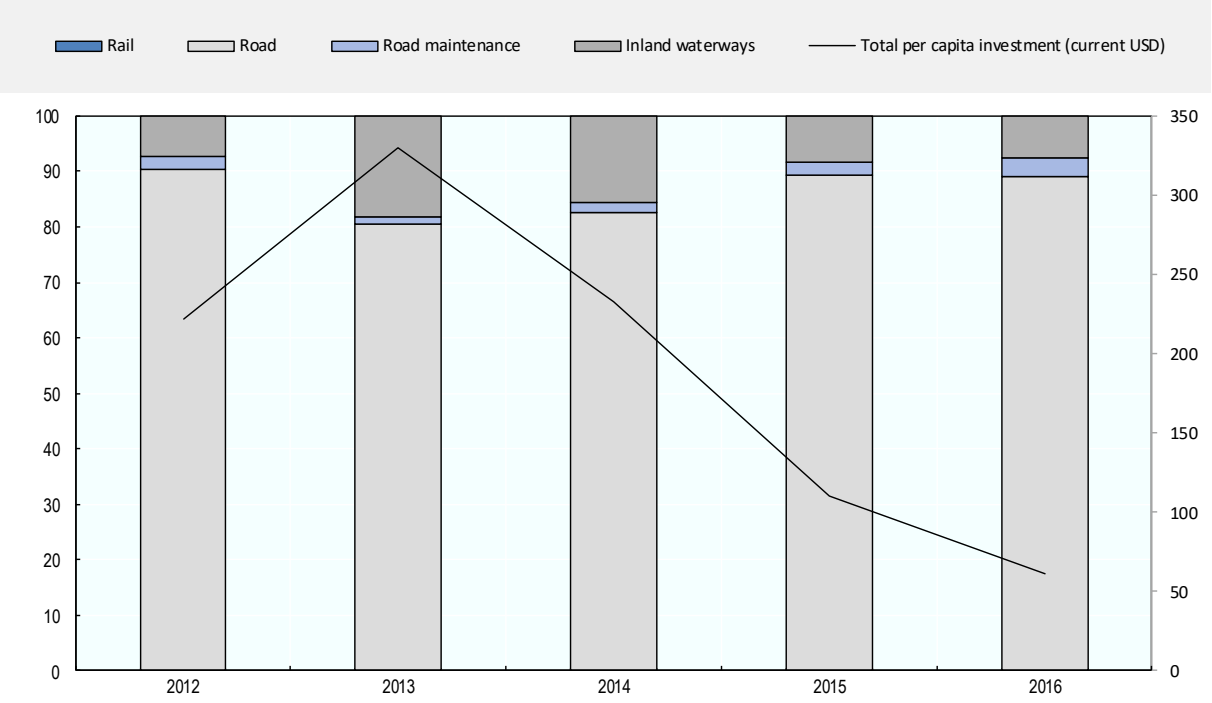
Source: OECD analysis based on accessed databases as of June 2019

Transport

Transport costs are high in Azerbaijan, and domestic connectivity outside of the capital, Baku, presents a major barrier for rural residents' economic prospects. Azerbaijan's road and rail networks are in need of modernisation and increased spending on maintenance in order to take advantage of the country's position by the Caspian Sea and being in proximity to major markets such as Iran, the Russian Federation and Turkey (World Bank, 2015[16]). However, in recent years Azerbaijan's per capita spending on transport infrastructure has declined (see Figure 2.7). Road infrastructure investments dominate government spending on transport infrastructure, while inland waterway transport infrastructure remains of significant but secondary importance. Only 0.2% of inland infrastructure spending benefits the country's rail network (ITF, 2019[20]).

Figure 2.7. Inland transport infrastructure investment in Azerbaijan (2012-2016)

Modal share (%) of total inland infrastructure investment (left axis) and total inland transport infrastructure investment in current USD per capita (right axis)



Source: ITF (2019[20]), *Transport performance indicators*, International Transport Forum, https://doi.org/10.1787/trsprt-data-en

Azerbaijan's inland transport modal split for freight has shifted towards road over time. In 2005, road only accounted for 44% of the country's freight, measured in tonne-kilometres, but by 2015 it had risen to 71% (15.5 billion tkm), while rail's share dropped from 56% to 29% (6.2 billion tkm). For passengers, road's dominance is even starker: in 2015, 98% of passenger transport (23.8 billion passenger-km, up from 15.3 billion pkm in 2009) occurred by road, compared to only 2% (0.5 billion pkm, down from 1.0 billion pkm in 2009) by rail (UNECE, 2018[21]).

In the road sector, the government's main development strategy, *Azerbaijan – 2020: View to the Future*, prioritises the development of two corridors: one running east-west from the capital Baku to Georgia and another north-south corridor from the Russian Federation to Iran (Government of Azerbaijan, 2012[22]). The World Bank, however, has recommended focusing on secondary and local roads to improve domestic connectivity and bring down travel and trade costs (World Bank, 2015[16]).

Azerbaijan's Caspian Sea port complex in Baku is the country's most important transport infrastructure asset, and the government has prioritised it for further development through modernisation and capacity increase investments mandated by *Azerbaijan – 2020* (Government of Azerbaijan, 2012[22]). As Azerbaijan may exhaust its oil and gas reserves within the next 30 years at current production rates, the Baku's new, modern port in the Alat district is seen as a key component of the country's strategy to transition from an oil producer to a regional transport and commercial hub (Shepard, 2016[23]).

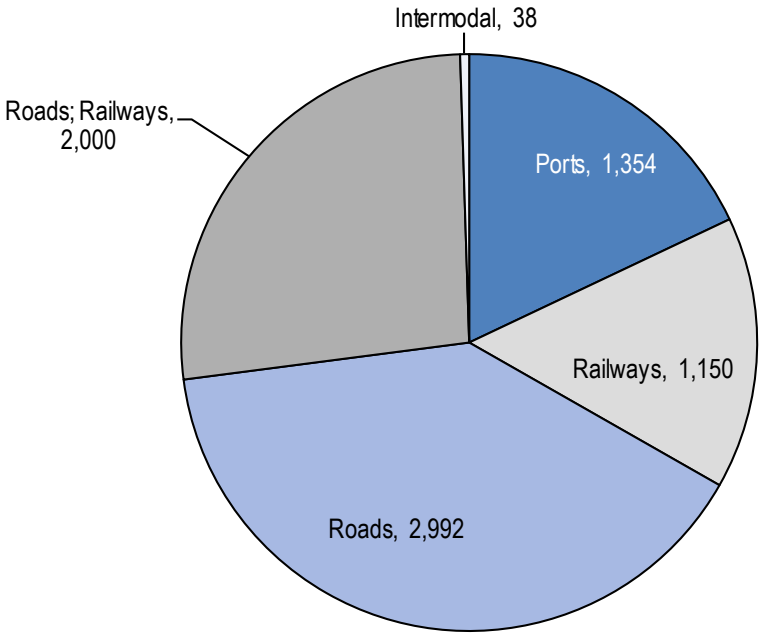
Azerbaijan's state-owned rail company, Azerbaijan Railways, owns and operates the country's rail network. Azerbaijan has international links with Georgia, Iran (only from the Nakhchivan exclave), the Russian Federation and Turkey (via the Kars-Tbilisi-Baku railway). Due to the ongoing conflict with Armenia over Nagorno-Karabakh (the self-proclaimed Republic of Artsakh), no rail links exist with Armenia and, as a consequence, rail traffic between the majority of Azerbaijan and its exclave must bypass Armenia via Iran or Georgia and Turkey. *Azerbaijan – 2020* lists rail links between the capital and Böyük Kəsik (on the Georgian border) and Yalama (on the Russian border) as priority projects (Government of Azerbaijan, 2012[22]).

Given its strategic position by the Caspian Sea and near large markets such as Turkey, Iran, Europe and Russia, Azerbaijan partakes in several international connectivity initiatives. Azerbaijan is a key component of the EU initiative TRACECA (Transport Corridor Europe-Caucasus-Asia), with its key Black Sea port (Baku) and well-established rail and road links to the Black Sea and onwards via Georgia and Turkey (TRACECA, 1998[24]). CAREC Corridor 2 also passes through Azerbaijan, linking Central Asia to the Caucasus via the port of Baku and onwards to Turkey and Europe through Georgia and its Black Sea ports (ADB, 2017[25]). Other initiatives include the Middle Corridor Trans-Caspian International Transport Route (2019[26]) (along with Georgia and Kazakhstan) and the South-West Transport Corridor (along with Georgia and Iran) (Financial Tribune, 2017[27]).

Azerbaijan's planned and current transport infrastructure projects account for around USD 7.5 billion, and consist primarily of roads (40% or nearly USD 3 billion), and projects that target both roads and railway development (27% or USD 2 billion) (see Figure 2.8). The rest of investments are shared between ports and railways, each holding similar shares of 18% and 15% respectively, followed by very small investments in an international logistics centre of USD 38 million (or around 1%). Investment projects in the roads sector are mainly focused on expanding or rehabilitating highways, which are important in order to further strengthen Azerbaijan's geographical position as an important link between the Black and Caspian seas and between Russia and Iran.

Figure 2.8. Transport projects in Azerbaijan, by sub-sector

Planned and under construction in USD million



Note: The category 'Roads; Railways' includes projects with both rail and road components, while 'Intermodal' refers primarily to logistics centres.
Source: OECD analysis based on accessed databases as of June 2019.

Cross-border connectivity projects make up the majority of Azerbaijan's transport investments (Table 2.2). This includes large-scale road and railway projects as well as ports that aim to increase Azerbaijan's connectivity with neighbouring countries as well as other international markets. Among the most important is the Afghanistan-Turkmenistan-Azerbaijan-Georgia-Turkey transport corridor, a USD 2 billion project that aims to enhance economic integration of participating countries through more intra-regional trade (AzerNews, 2018[28]). A number of projects are also part of the International North-South Transportation Corridor initiative, such as a 7 200 km freight route connecting India, Iran, Azerbaijan and Russia via ship, rail and road, which aims to increase connectivity and reduce transport costs (RailFreight.com, 2019[29]). Another example is the Astara-Astara Railway, a USD 1 billion project which is expected to become the second rail connection between Iran and Azerbaijan. At the same time, the USD 651 million Railway Sector Development Programme aims to rehabilitate the Sumgayit-Yalama rail line connecting Azerbaijan to Russia, which is also considered a key link in the North-South Railway Corridor of the CAREC corridors (ADB, n.d.[30]).

Table 2.2. Hotspot projects in the transport sector in Azerbaijan

(a) Under construction					
Name	Sub-sector	Description	Project value (USD million)	Funding source	Type of investment
Astara-Astara Railway (Qazvin-Rasht-Astara)	Railway	The project includes the development of a 82.5 meter long bridge over the Astarachay River, and is expected to become the second rail connection between Iran and Azerbaijan. The project is part of the International North-South Transportation Corridor initiative, which aims to increase connectivity and reduce transport costs. Construction started in 2016.	1 000	JSC Russian Railways and Azerbaijan Railways as project implementers.	Greenfield
Baku International Sea Trade Port Alyat (Phase 1)	Port	The project entails the construction of a new port in the southern part of Azerbaijan's capital and it is an extension of the Baku port. Upon completion, the port will have a capacity of 25 million tonnes and 1 million TEU. It is expected to be a major link between Europe, Turkey, Iran, India, and Russia. Construction started in 2016.	760	Government of Azerbaijan with Baku International Sea Trade and Port CJSC as project implementers and operators.	Greenfield
Railway Sector Development Programme	Railway	The project involves the rehabilitation of the track and structure of the Sumgayit -Yalama rail line. This rail line is considered as a key link in the North-South Railway Corridor within the CAREC network.	651	ADB, Government of Azerbaijan, French Development Agency	Brownfield
(b) Planned					
Name	Sub-sector	Description	Project value (USD million)	Funding source	Type of investment
Afghanistan-Turkmenistan-Azerbaijan-Georgia-Turkey Corridor	Road; Railway	The project will connect Torgundi (Afghanistan) with the port of Turkmenbashi (Turkmenistan) and, via the Caspian Sea, to Baku. From there, further connections will link Baku to Tbilisi, Poti and Batumi (Georgia) and further on to Ankara and Istanbul (Turkey).	2 000	Governments of Afghanistan (20%), Turkmenistan (20%), Azerbaijan (20%), Georgia (20%), Turkey (20%)	Greenfield
Hajigabul-Georgian Border Motorway Expansion Project	Road	The project involves the expansion into a four-lane road of 184 km of dual-lane highway between Hajigabul and the Georgian Border in Azerbaijan. The project is jointly financed by BNP Paribas and the World Bank. The project was approved in 2010 and completion is expected by the end of 2019.	600	BNP Paribas, World Bank	Brownfield

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.
Source: CSIS (2019[31]); UNESCAP (2017[32])

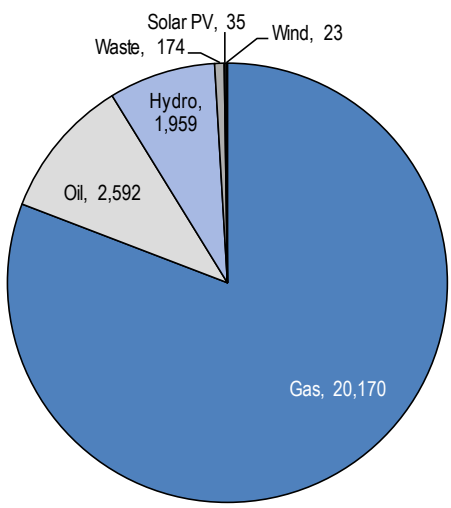
Energy

Overall, Azerbaijan's energy sector benefits from better quality infrastructure than other strategic sectors, but the country's electricity transmission and distribution systems underperform compared to its neighbours. While neighbouring Georgia's electricity grids led to losses of 7.3% of electricity output, the Azerbaijani transmission and distribution networks have a loss rate of 9.7% (IEA, 2019[33]). Like other former Soviet Union countries, Azerbaijan has achieved universal electricity access.

The energy sector is of fundamental importance to the Azerbaijani economy. Petroleum products account for over 90% of Azerbaijan's exports, and the oil and gas industry makes up a large but variable share of the economy. Oil and gas accounted for 33% of Azerbaijan's GDP in 2016 when oil prices were low (USD 46.4 per barrel of Brent crude) and 50% in 2011 when oil prices were higher (USD 112 per barrel) (Deloitte, 2017[34]). To export its oil and gas to Turkey and onwards to Europe, Azerbaijan has several pipelines that cross its neighbour, Georgia: the Baku-Tbilisi-Ceyhan (BTC) pipeline, Baku-Tbilisi-Erzurum (BTE) pipeline and the Trans-Anatolian Natural Gas Pipeline (TANAP) (Emerging Markets Forum, 2019[35]).

Azerbaijan's electricity generation relies on its hydrocarbon resources. Natural gas-fired power plants generate 81% of the country's electricity; while petroleum-fired power plants contribute a further 10% (see Figure 2.9). Historically, Azerbaijan relied more heavily on oil-fired power plants than on cleaner burning natural gas-fired plants. The former accounted for 66% of generated electricity in 1995 compared to just 16.9% for natural gas, but by the 2000s natural gas-fired electricity generation had surpassed oil-fired power. Hydroelectric dams are also an important part of Azerbaijan's electricity mix, although their share has varied considerably in the past decade. Hydro accounted for 8% (2.0 TWh) of the country's electricity in 2016, which is considerably less than in 2010 (18%, 3.4 TWh) but a slight increase from 2015 (6.6%, 1.6 TWh). Azerbaijan also began generating electricity from waste incineration in the 2010s; by 2016 waste accounted for 1% of power generation. Other renewables also account for small but increasing fractions of Azerbaijan's electricity mix: Wind and solar photovoltaics (PV) generated 23 MWh (0.09%) and 35 MWh (0.14%) respectively in 2016 compared to 1 MWh (0.005%) in 2010 for wind and 5 MWh (0.02%) in 2015 for solar PV (IEA, 2018[36]).

Figure 2.9. Electricity generation by fuel (GWh, 2016)



Source: International Energy Agency (2018[36]), *IEA World Energy Balances 2018*, International Energy Agency, https://webstore.iea.org/world-energy-balances-2018

Azerbaijan, as a result of its hydrocarbon reserves, is a net energy exporter and does not face the same energy security concerns as its neighbour Georgia. It exported 37.3 Mt and 36.5 Mt of oil in 2015 and 2016 respectively making it the third largest oil exporter in the

former Soviet Union after the Russian Federation and Kazakhstan. It is also a net exporter of natural gas (6.8 Mtoe in 2015, 6.5 in 2016) and electricity (0.01 Mtoe in 2015, 0.08 Mtoe in 2016) (IEA, 2018[36]).

Although the government of Azerbaijan identifies economic diversification and strengthening of the 'non-oil sector' as key priorities in its development strategy *Azerbaijan-2020*, many of its energy-related goals support the continued dominance of oil and gas in the energy sector and economy more widely. *Azerbaijan-2020* singles out Phase 2 of the Shah Deniz gas field and its connection to the Trans-Anatolian natural gas pipeline (TANAP) as priorities (Government of Azerbaijan, 2012[22]).

The government has set a number of targets related to renewable energy use and energy efficiency. The *National Strategy of Azerbaijan on the Use of Alternative and Renewable Energy Sources (2015-2020)* aims to increase the share of renewables in electricity generation to 20% and in total energy consumption to 9.7% by 2020 (EaPGREEN, 2016[37]). The *Strategic Roadmap on Development of Utilities* sets the following goals for diversifying the country's installed capacity for electricity generation: 350 MW of wind, 50 MW of solar and 20 MW of bioenergy by 2020 (President of Azerbaijan, 2016[38]). Recognising the inefficiency of existing transmission and distribution networks, the *Roadmap* also aims to reduce electricity losses to 7% in Baku and 8% elsewhere in the country as well as to limit natural gas losses to 8% throughout the country (Det Norske Veritas, 2018[39]).

In terms of investment projects in electricity generation under construction and planned, Azerbaijan's main focus is on wind-farm projects, which account for almost 100% of investments for a total capacity of around 824 MW. In fact, wind power generation is one of the biggest potential sources for renewable energy generation, with a potential capacity of 4 500 MW (Aliyeva, 2018[40]). Yet, despite this potential, investments in wind power projects are small compared to continued investment in the oil and gas industry. There is a strong focus on large-scale upstream oil and gas projects as well as oil and gas pipelines among Azerbaijan's energy projects (see Table 2.3). Several of these projects are part of the Southern Gas Corridor, which consists of several infrastructure projects aimed at increasing the energy security of Turkey and the European Union by bringing gas from the Caspian region to Europe (AIIB, 2016[41]).

One of the most significant projects under construction, which is also expected to have environmental implications, is the Shaz-Deniz Full Field Development Project, which is one of the largest gas development projects in the world estimated to cost around USD 28 billion with financing from a consortium of oil companies. It will allow export of gas from Azerbaijan to Europe and Turkey through more than 3 500 kilometres of pipelines across Azerbaijan, Georgia, Turkey, Greece, Bulgaria, Albania and under the Adriatic Sea to Italy. Another important planned project is the Trans Anatolian Natural Gas Pipeline (TANAP) Project, a 1 850 km pipeline that will allow Azerbaijan to almost triple its exports of natural gas from 8.1 bcm per annum to about 24 bcm per annum, therefore strengthening the country's integration with regional and European energy markets (AIIB, 2016[41]).

Table 2.3. Hotspot projects in the energy sector in Azerbaijan

Name	Sub-sector	Description	Project value (USD million)	Funding source	Type of investment
(a) Under construction					
Shah-Deniz Full Field Development (FFD)	Upstream oil and gas	The project involves the full development of Shah-Deniz gas field by adding 16 billion cubic metres per year (bcma) of gas production (stage 2) to the existing 8 bcma (stage 1). As one of the largest gas developments in the world, its expansion will substantially increase the security and diversity of European gas imports. It will allow for export of gas from Azerbaijan to Europe and Turkey. The project has been under construction since 2015.	28 000	BP Global, TPAO, SOCAR, PETRONAS, Lukoil, NICO	Greenfield
Azerbaijan-Georgia-Romania-Interconnection (AGRI) LNG project	Oil and gas pipeline	The project involves the construction of a LNG pipeline to supply LNG from Azerbaijan over the Black Sea to Romania and a regasification terminal at the Romanian port of Constanta. The project's projected capacity varies between 2 and 8 bcma.	4 500	SOCAR, GOGC, MVM Group	Greenfield
Trans Adriatic Pipeline	Oil and gas pipeline	The project involves the construction of a 878km-long pipeline that will transport natural gas from Shah Deniz II field in Azerbaijan to Southern Italy, and further to Western Europe. The initial annual capacity of the project will be 10 billion cubic metres. The project is the final section of the Southern Gas Corridor transporting natural gas from the Caspian Sea to Europe.	4 287	Snam Rete Gas, BP Global, SOCAR, Fluxys, Enagas, AXPO Group	Greenfield
Trans-Caspian Gas Pipeline	Oil and gas pipeline	The project involves the construction of a 300km-long pipeline that will transport gas from Turkmenistan to Russia via Kazakhstan. The total capacity will be 10 bcma.	3 000	Government of Azerbaijan	Greenfield
Power Distribution Enhancement Investment Program - Tranche 1	Electric power transmission and distribution	The project involves the upgrading of power distribution networks in secondary cities and rural areas to provide more reliable electricity to households. Overall, the project is expected to benefit 1.4 million consumers and stimulate the overall economy.	325	ADB	Brownfield
(b) Planned					
Trans Anatolian Natural Gas Pipeline (TANAP) Project	Oil and gas pipelines	The project plans to build a 1 850km-long natural gas pipeline from Shah Deniz 2 field in Azerbaijan to Turkey. The total capacity will be 16 bcma, whereby 6bcm/annum will be consumed by Turkey while the remaining will be sold to markets in South Eastern Europe. The project is part of the Southern Gas Corridor Program and was approved in 2016. .	8 600	EBRD; World Bank; AIIB; EIB; Turkey; British Petroleum; Private Commercial Sources; Azerbaijan	Brownfield
Alat Gas-fired IPP Project	Natural gas	The planned project entails the construction of a 750 MW natural gas-fired electric power plant in Azerbaijan. The project encountered significant delays. The Alat Gas-fired IPP project is the country's first independent power producer (IPP).	1 100	Korea Electric Power Corp	Greenfield
Wind Farm Project in the Caspian Sea	Wind	The planned project entails the construction of a 200 MW wind farm in the Caspian Sea financed by China's Export Import Bank. The project is expected to fully contribute to the renewable energy capacity of Azerbaijan.	510	China Export Import Bank	Greenfield
Pirallahi Island Wind Farm Project	Wind	The project entails the construction of a 200 MW wind power station to provide stable electricity to Pirallahi and Chilov islands	430	N/A	Greenfield
Pirekushkul Wind Farm	Wind	The project comprises the construction of a wind farm located in Absheron, Azerbaijan. The total capacity is estimated at 100 MW.	226	N/A	Greenfield

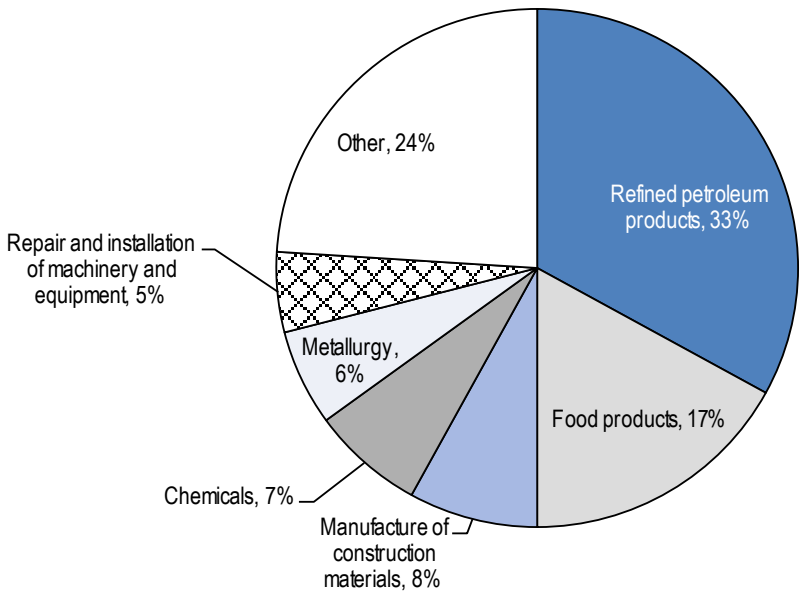
Note: Refer to the Preamble for the present report's definition of 'hotspot' and other information on how the projects above were selected and prioritised. GOGC = Georgian Oil and Gas Corporation; NICO = Naftiran Intertrade Company; PETRONAS = *Petroliam Nasional Berhad* (Malaysian oil and gas company); SOCAR = State Oil Company of Azerbaijan Republic, TPAO = *Türkiye Petrolleri Anonim Ortaklığı* (Turkish Petroleum)
Source: ADB (2019[42]), AGRI (n.d.[43]), AIIB (2019[44]); BP Azerbaijan (n.d.[45]), CSIS (2019[31]), Dealogic (2019[46]), the Export-Import Bank of China (2019[47]), IJGlobal (2019[48]), Renewables Now (n.d.[49]), Thomson One (2019[50]),
Trans Adriatic Pipeline AG (n.d.[51]), Trans-Caspian Pipeline (n.d.[52]) as of June 2019.

Industry and mining

Azerbaijan's manufacturing sector is highly connected to the country's oil and gas industry, with refinement of petroleum products and the production of chemicals, primarily petrochemicals, accounting for 33% and 7% of manufactured industrial output respectively (see Figure 2.10). Other than hydrocarbon-related products, the only other part of the manufacturing sector with a significant role in Azerbaijan's exports is metallurgy, primarily aluminium, iron and copper products. In the case of Azerbaijan's aluminium industry, however, the country exports more raw aluminium than finished aluminium goods (e.g. aluminium plating) (Observatory of Economic Complexity, 2017[6]).

Figure 2.10. Manufactured product categories by value, 2017

% of total output of manufactured products



Source: The State Statistical Committee of the Republic of Azerbaijan (2018[53]), *Industry of Azerbaijan: Manufacture of the most important types of industrial products in natural value*, The State Statistical Committee of the Republic of Azerbaijan, https://www.stat.gov.az/source/industry/?lang=en

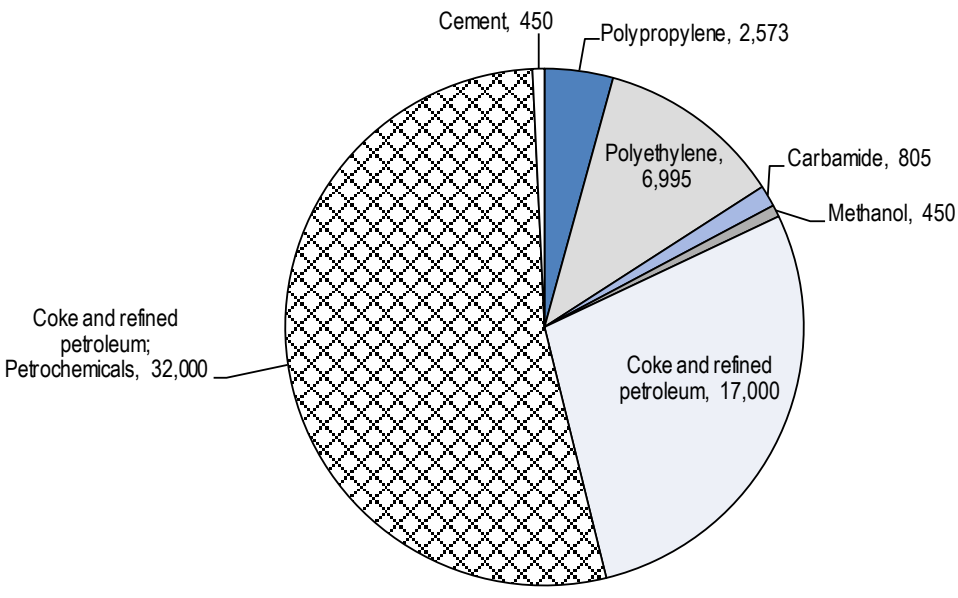
The *Strategic Road Map on Development of Heavy Industry and Machinery* identifies the following industries as priorities for development to reduce dependence on oil and gas: mining, metallurgy, construction materials (cement), oil and gas processing and electrical equipment production. By 2020, Azerbaijan aims to construct a new iron ore extraction and processing plant and to reduce its reliance on imported parts for agricultural equipment by

65% and for gas equipment by 45% (President of Azerbaijan, 2016[54]). *Azerbaijan-2020* lists a number of diverse industries for development in addition to those in the *Strategic Road Map*: aluminium production, the space industry and food industries (Government of Azerbaijan, 2012[22]).

Azerbaijan's investments in the manufacturing sector show a strong focus on coke and refined petroleum and chemicals projects. According to Figure 2.11, hydrocarbon-related projects for the production of fuels (coke and refined petroleum) or petrochemicals account for the vast majority of Azerbaijan's investment in industry. Over 53% (USD 32 billion) of investments are directed towards the production of both fuels and petrochemicals, while a further 28% of investments focus exclusively on fuels (coke and refined petroleum). Projects for the production of petrochemicals such as polyethylene (12%) and polypropylene (4%) also make up a significant portion of investments. Such projects are expected to support the development of the petrochemical and chemical industry including through modern technologies, allowing Azerbaijan to be one of the largest producers in the region. For example, the Sumgait Polypropylene Plant is a USD 995 million project located close to the capital Baku and is expected to produce around 184 000 tonnes of polypropylene per year, 70% of which will be exported to Europe, Turkey and other neighbouring countries (see Table 2.4).

Figure 2.11. Industry projects in Azerbaijan, by sub-sector

In USD million



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

Table 2.4. Hotspot industry projects in Azerbaijan

Name	Sub-sector	Description	Project value (USD million)	Funding source	Type of investment
SOCAR Gas Processing and Petrochemicals Plant	Coke and refined petroleum; Chemicals	The project involves the construction of a gas processing and petrochemicals plant 60km south of Baku. The total capacity of the plant will be approximately 10 billion cubic m of natural gas per annum. The project is under construction since 2016.	15 000	SOCAR	Greenfield
Ethylene-Polyethylene Plant of the Azerikimya State	Chemicals	The project involves the development of 19 petrochemical plants with modern technologies. The plants will allow Azerbaijan to be the largest different petrochemical product producer in the region. The project is under construction since 2008.	6 000	Azerikimya State Concern Private Investment	Greenfield
Sumgait Polypropylene Plant	Chemicals	The project involves the construction of a polypropylene plant located 30km north of Baku. The expected capacity is 184 000 tonnes per year, 30% of which will be for the local market and the rest to be exported to Europe, Turkey and CIS. The project is under construction since 2013.	995	SOCAR; Gilan Holding; Pasha Holding; Azersun Holding.	Greenfield
(b) Planned					
Name	Sub-sector	Description	Project value (USD million)	Funding source	Type of investment
Baku Oil & Gas Processing Complex	Coke and refined petroleum	Project planned since 2014	17 000	SOCAR	N/A
Garadag Refinery and Petrochemical Complex	Coke and refined petroleum; Chemicals	Project planned since 2012	17 000	SOCAR	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. SOCAR = State Oil Company of Azerbaijan Republic.
Source: SOCAR GPC (2019[55]), Chemicals Technology (2019[56]), Thomson One (2019[50]), IJGlobal (2019[48]).

Water

Azerbaijan presents limited investments in the water sector. Currently, there is only one project financed by the World Bank related to the Second National Water Supply and Sanitation Project, accounting for a total of USD 234 million. The project aims at providing reliable water supply and sanitation services in selected regional centres of the country (World Bank, n.d.[57]). In general, Azerbaijan's water supply and sanitation infrastructure is of relatively good quality. It has the second highest share of population with access to clean water (92%) in the region, just behind Kazakhstan (93%), and the second most reliable water supply, after Georgia (World Economic Forum, 2017[18]). At the same time, only around half of Azerbaijan's potentially arable land is equipped for irrigation and half of the irrigated agricultural land lacks adequate drainage (ADB, 2019[58]). To further improve Azerbaijan's water infrastructure, the *Strategic Roadmap on Development of*

Utilities aims to reduce commercial losses of water from 20% to at least 14% and distribution losses from 31% to 25% by 2020. It also aims to increase the level of waste water collection from 46% to 65% (President of Azerbaijan, 2016[38]).

2.3 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

Azerbaijan adopted a long-term development strategy in 2012, *Azerbaijan 2020: A Look to the Future*, which describes the government's vision for strengthened economic growth, diversification away from fossil fuels and the development of key sectors, including information and communications technologies (ICT) and logistics (see Table 2.5 and Table 2.6). The government complemented this document in 2016 with its *Strategic Road Map on the National Economy* and a series of twelve sectoral road maps for key economic sectors with quantitative targets for 2020, 2025 and some unspecified for post-2025.

Azerbaijan needs a longer-term development strategy, preferably to the mid-century, to plan its transition towards other economic activities. While *Azerbaijan 2020* and the *Strategic Road Map* both discuss environmental challenges, they do not articulate a clear action plan on greenhouse gas emissions or the long-term sustainability of the country's transport and energy systems. Azerbaijan would benefit from a coherent document with a strong environmental focus and, crucially, a sufficiently long time horizon to evaluate the synergies and trade-offs associated with different infrastructure investments.

Azerbaijan also lacks formal strategies, instead it has set strategic directions for certain key sectors. One of the *Strategic Road Map*'s primary objectives is to strengthen the non-oil sectors of the economy through increases in foreign direct investment (FDI) flows, support for export-oriented non-oil industries and increased employment in services (particularly tourism) and commodities manufacturing (e.g. industry and food production). The *Strategic Road Map* also calls for the government to reduce its budgetary dependence on transfers from SOFAZ, Azerbaijan's energy-related sovereign wealth fund, from about 50% in 2016 to 15% by 2025. However, despite these goals of economic diversification, the oil and gas sector still looms large in the country's development vision, most notably with the expansion of production at the Shah Deniz gas field.

Among the sectoral road maps that accompanied Azerbaijan's *Strategic Road Map on the National Economy* were strategies relating to upstream oil and gas, the *Strategic Road Map on Oil and Gas Development,* and the end use of energy (both from hydrocarbons and other sources), the *Strategic Roadmap on Development of Utilities*. However, Azerbaijan does not have a strategy for the energy sector as a whole and currently lacks legislation on energy efficiency standards. The government is in the process of drafting both documents (EU Neighbours, 2018[59]).

In the transport sector, both *Azerbaijan-2020* and the *Strategic Road Map on the Development of Logistics Outcomes* set goals relating to the development of transport, primarily in terms of international connectivity and trade facilitation. Neither document presents a holistic development plan for the transport sector including improved secondary and rural roads to improve domestic connectivity, which has been identified as a barrier to regional economic development (World Bank, 2015[16]).

Institutional set-up and decision making processes

Recent institutional changes have weakened the position of key infrastructure sectors. In 2017, Azerbaijan's Ministry of Transport was merged into the Ministry of Communication and High Technologies to form the Ministry of Transport, Communications and High Technologies. Based on human resource allocations, the new ministry remains dominated by the previous Ministry of Communications and High Technologies: according to the new ministry's website, the two transport-related departments have only 23 employees, while the four ICT-related departments employ 40. Moreover, the minister and all of his deputies previously worked at the Ministry of Communication and High Technologies (Ministry of Transport, Communications and High Technologies of the Republic of Azerbaijan, n.d.[60]).

In 2019, Azerbaijan abolished the State Agency for Alternative and Renewable Energy Sources, which had previously developed the *National Strategy of Azerbaijan on the Use of Alternative and Renewable Energy Sources (2015-2020)* (President of Azerbaijan, 2019[61]). It is unclear which government bodies are now responsible for delivering on the agency's portfolio and how or if a similar unit dedicated to renewables will be integrated in Azerbaijan's new institutional set up.

Azerbaijan is a party to the Convention on Environmental Impact Assessment (EIA) in a Transboundary Context (the Espoo Convention), and in 2018 Azerbaijan adopted a Law on Environmental Impact Assessment. However, the parties to the Convention have signalled that Azerbaijan's existing legislation and current lack of secondary legislation relating to EIA do not comply with the articles of the Convention (UNECE, 2019[62]).

Unlike neighbouring Georgia, Azerbaijan is not a signatory of the Protocol on Strategic Environmental Assessment (SEA). However, Azerbaijan in conjunction with the EaP-GREEN programme carried out a pilot SEA of the *National Strategy on the Use of Alternative and Renewable Energy Source (2015-2020)* (EaPGREEN, 2016[37]). EaP GREEN has also supported training programmes and workshops in Azerbaijan as well as the publication of Azeri-language documents on SEA's benefits to encourage the tool's adoption and use (UNECE, n.d.[63]).

List of relevant strategic documents

Table 2.5. Main strategic documents in force

	Status	Time Horizon	Sectoral Coverage	Main objectives
First Nationally Determined Contribution (NDC)	Submitted in 2017	2017-2030	Economy-wide	• Target: to achieve a 35% reduction in total greenhouse gas emissions compared to 1990 levels by 2030 • Main sectors for emission reduction: Energy sector (ensure the development of legislative acts and regulatory documents for the energy sector, replace existing technology with modern, environmentally friendly technology, reconstruct energy distribution networks for example to reduce gas distribution losses by 1% by 2020), Transport sector (promote the use of electric vehicles for public transportation, ensure the electrification of railway lines), Waste management sector (develop a modern solid waste management system)

Azerbaijan – 2020: A Look to the Future	Adopted in 2012	2011-2020	Governance, transport, energy, water, industry	• Achieve a per capita GDP of USD 13 000 by 2020 • Reach highest positions in group of countries with high human development in accordance with the human development classification of the UN Development Programme • Ensure an increase in the construction and use of renewable and alternative energy sources • Modernise 6 international airports • Provide villages and cities with water purifying installations and ensure regular water quality monitoring to improve the water supply service • Modernise the petrochemical industry • Ensure the diversification of the economy, moving away from the oil and gas sector
Strategic Roadmap on the National Economy	Adopted in 2016	2016-2025	Governance, energy, industry, transport	• Further strengthen the judicial system • Improve the business environment • Ensure the adoption of the most appropriate and competitive tax and tariff rates • Develop regional scale transport-logistics corridors • Minimize the energy used to produce each unit of GDP by increasing the share of renewable energy sources
Strategic Roadmap for Development of Logistics and Trade in the Republic of Azerbaijan	Adopted in 2016	2016-2025	Governance, energy, industry, transport	• Transform Azerbaijan into a regional logistics hub • Conduct feasibility studies for increasing the number of free trade zones • Increase the volume of trade and promote higher value added trade to help diversify the economy • Elevate the role of the private sector within the economy
National Strategy of Azerbaijan on the Use of Alternative and Renewable Energy Sources (2015-2020)	Adopted in 2015	2015-2020	Governance, Energy	• Increase the share of renewable energy within the energy sector • Organise centralised management structures in the renewable energy sector • Establish a normative legal framework for the use within the alternative and renewable energy sector • Improve the tariff policy for renewable energy
Strategic Roadmap on Oil and Gas Development	Adopted in 2016	2016-2025	Energy, Industry	• Ensure national energy security, for example through the protection of offshore energy infrastructure • Diversify gas transportation options • Develop relationships with Caspian states and European states in the oil and gas sector
Strategic Roadmap on Development of Utilities	Adopted in 2016	2016-2025	Energy, Water	• Increase investment in alternative and renewable energy sources • Increase the country's generation capacity by 1 000 MW in the next 5-10 years, 420 MW being generated by renewable energy sources (wind: 350

				MW, solar: 50 MW, bioenergy: 20 MW) • Revision of tariffs in the energy market
Strategic Roadmap on Development of Heavy Industry and Machinery	Adopted in 2016	2016-2025	Industry	• Implement energy saving technology which also meets environmental standards • Increase heavy industry production output

Table 2.6. Other relevant documents

	Status	Time Horizon	Sectoral Coverage
Strategic Roadmap for Development of Specialised Tourism Industry in the Republic of Azerbaijan	Adopted in 2016	2016-2025	Multi-sector
Action Plan on the Improvement of the Ecological Situation for 2010-2014	Adopted in 2010	2010-2014	Multi-sector
National Programme on Environmentally Sustainable Social and Economic Development for the period 2003–2010	Adopted in 2003	2003-2010	Multi-sector
State Programme for the Socioeconomic Development of the Regions of Azerbaijan for the period 2009–2013	Adopted in 2009	2009-2013	Multi-sector, primarily energy and water
State Programme on Reforestation and Afforestation for the period 2003–2008	Adopted in 2003	2003-2008	Multi-sector
State Programme on Summer/Winter Pastures, Effective Use of Meadows and Desertification Prevention for the period 2004–2010	Adopted in 2004	2004-2010	Multi-sector
State Programme for the Development of Fuel Energy Complex for the period 2005–2015	Adopted in 2005	2005-2015	Energy
Hydrometeorology Development Programme for the period 2004–2010	Adopted in 2004	2004-2010	Water
State Strategy on Hazardous Waste Management for the period 2004–2010	Adopted in 2004	2004-2010	Waste Management

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Chapter 3. Georgia's sustainable infrastructure investments

This chapter describes sustainable infrastructure planning in Georgia and presents current trends in investment in large-scale infrastructure projects. It compares Georgia's infrastructure plans in the energy, transport, industry and water sectors against its international commitments under the Paris Agreement on climate change and the Sustainable Development Goals (SDGs). The chapter also explores Georgia's strategic documents for long-term economic development, sectoral development and the environment, including those related to climate change mitigation and adaptation. It identifies misalignments between stated goals and observed investment flows and provides recommendations to improve strategic planning for sustainable infrastructure.

Overview

Georgia is a lower-middle income country in the south Caucasus. With the most favourable investment climate in the region, it has become an attractive destination for foreign investment. Significant structural reforms have been carried out to simplify business procedures, construction permits, licencing and permitting regimes, as well as to improve tax and customs procedures. In 2019, Georgia ranked 6th in the World Bank's Ease of Doing Business Indicators, up from 115th in 2005. Georgia attracts investment from many different countries and in all sectors of the economy, from financial services to coal, oil and gas and renewable energy. Yet, little FDI is directed towards infrastructure projects.

Georgia's existing infrastructure varies in quality, with relatively high-quality electricity infrastructure, mainly based on hydropower (more than 80%), and lower-quality transport and water infrastructure. Improving connectivity to foreign markets through both hard infrastructure (e.g. transport links) and soft infrastructure (e.g. institutions) is a priority to boost Georgia's productivity, and is reflected in the list of planned transport projects that intend to create new corridors connecting Georgia by road and rail to neighbouring countries. However, currently planned energy projects do not necessarily align with the government's overall objectives to diversify the country's electricity generation mix, as hydropower still represents more than 90% of planned electricity generation capacity. Continued near-exclusive reliance on hydroelectricity could create energy security concerns in the long term, as Georgia's water resources are particularly vulnerable to a changing climate.

In this context, the lack of long-term strategic documents in Georgia is of significant concern. Georgia's adopted development strategies and government programmes only extend to 2020 and do not contain quantitative, time-bound targets nor do they delegate responsibility for progress on government priorities. The absence of a national energy strategy and supporting policies makes it difficult to assess energy projects' compatibility with national supply and demand trends as well as energy security concerns and long-term environmental objectives. While the country's policy environment has become conducive to investment, institutional capacity of government bodies has not kept pace with improvements. Such capacity is necessary to analyse risks effectively and develop, screen and implement infrastructure projects.

3.1 State of play: economy, investment and climate change in Georgia

Economy and trade

Table 3.1. Key indicators on Georgia's economy

Population (2018)	3 731 000
Urbanisation rate (2018)	58.6%
Annual population growth (2018)	0.08%
Surface area	69 700 km^2
GDP (USD, current price, 2018)	16 210 million
GDP per capita (USD, current price, 2018)	4 345
Real GDP growth (year-on-year change, 2019)	4.6%
Inflation (average consumer price, y-o-y change, 2017)	6.0%
Exports of goods and services (% of GDP, 2018)	55.1%
Imports of goods and services (% of GDP, 2018)	66.7%
FDI, net inflows (% of GDP, 2018)	7.3%
General government net lending/borrowing (% of GDP, 2019)	-1.7%
Unemployment (% of total labour force, 2018)	14.1%
Remittances (% of GDP, 2018)	12.6%
Transparency, accountability and corruption in the public sector rating (1= most corrupt, 6 = least corrupt, 2013)	3.5

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

Georgia is a lower-middle income country in the Caucasus. Its population, the second smallest in the present study's sample after Mongolia, shrank dramatically from 4.9 million in 1993 to 3.7 million in 2013 but has since stabilised. After two decades of nearly uninterrupted negative population growth, growth turned positive in 2014 (at 0.05%). Since then, Georgia's population growth rate has remained the slowest among the countries in Central Asia and the Caucasus (0.06% in 2016, 0.01% in 2017 and 0.08% in 2018).

The Georgian economy initially followed a similar trajectory to its population immediately after the breakup of the Soviet Union, falling from USD 7.8 billion in 1990 to USD 2.5 billion in 1994. It then recovered over the next two decades to USD 16.2 billion in 2018.

Georgia's government only has effective control over about 80% of its internationally recognised territory (Ellyatt, 2019[3]). Two regions, Abkhazia in the northwest and South Ossetia in the north, declared themselves independent republics and, receiving support from neighbouring Russia, gained control of their claimed territories through a series of armed conflicts beginning right after independence (1991-1992 in South Ossetia, 1992-1993 in South Ossetia) and culminating in the Russo-Georgian War of 2008. Only a few UN member countries (the Russian Federation, Nicaragua, Venezuela, Nauru and Syria) recognise the independence of the two breakaway regions, while the rest of the world recognises them as integral parts of Georgia.

Georgia has the most service sector-oriented economy in the region, along with Kazakhstan. Services accounted for 57.6% of GDP in 2017, compared to 22.6% for industry and construction and only 6.9% for agriculture (World Bank, 2019[1]).

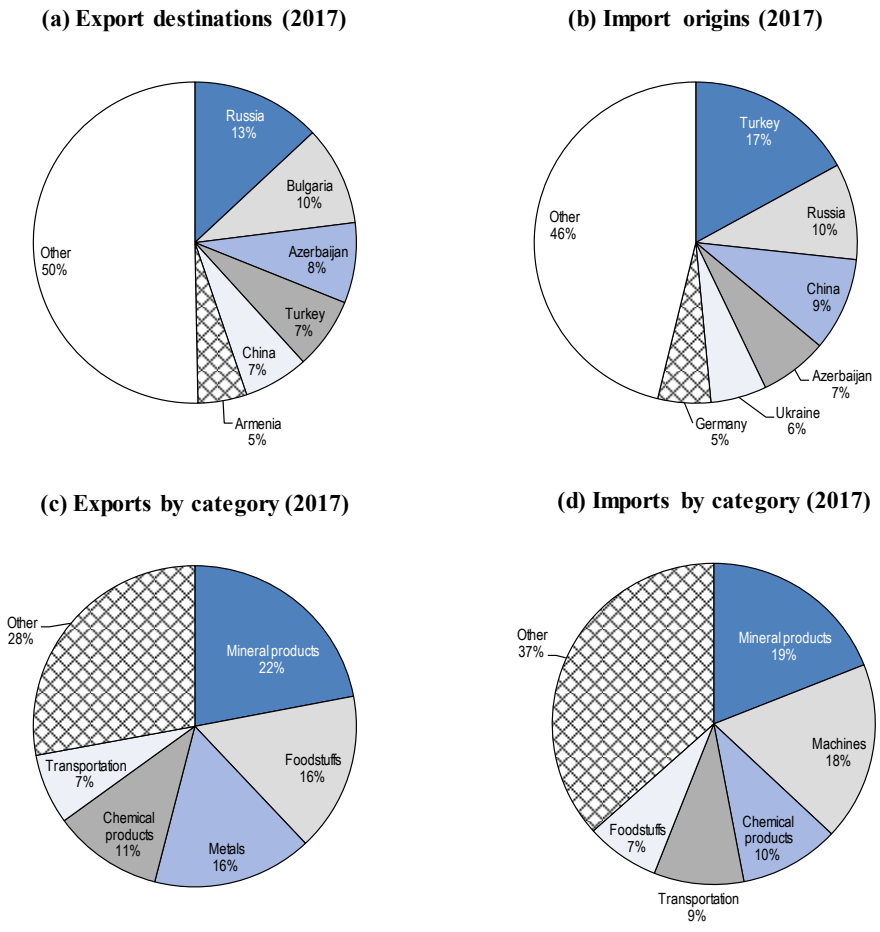
Trade

Georgia has been a member of the World Trade Organisation since 2000 and has close ties with the European Union, being a target country of the European Union's European Neighbourhood Policy under the Eastern Partnership (EaP) policy initiative. These initiatives aim to deepen EU-Georgia relations through actions focusing on economic development, governance, connectivity and people-to-people contact (European Commission, 2019[4]). In 2014, Georgia and the European Union signed an Association Agreement and established a Deep and Comprehensive Free Trade Area (DCFTA) (European Commission, 2017[5]). In 2017, Georgia became a Contracting Party of the EU's Energy Community, thereby committing to implement the EU's energy-related *acquis communautaires* and liberalise its energy markets.

Georgia exports a more diversified array of products than most countries in the region (see Figure 3.1(c)). Its most important export categories by value are mineral products (primarily copper ore, which accounts for 16% of total exports), foodstuffs (particularly wine, hard liquor and water, accounting for 5.4%, 3.7% and 3% respectively), metals (mostly ferroalloys, 9.9%), chemical products and transportation (cars, 6.1%). Georgia's imports are even more diverse (see Figure 3.1(d)). Georgia's imports of fuels (refined petroleum and petroleum gas account for 8.7% and 4.3% of imports respectively) explain the comparatively large share of mineral products in the country's import mix.

Georgia is less reliant on individual trading partners than most countries in the region (see Figure 3.1(a) and (b)). Most of its largest export and import markets are its geographical neighbours, especially Russia (13% of exports, 10% of imports), Turkey (7% of exports, 17% of imports) and Azerbaijan (8% of exports, 7% of imports), and, to a lesser extent, Armenia (5% of exports, 3% of imports) and Ukraine (3% of exports, 6% of imports). Although individual European countries account for only small shares of Georgia's trade, as a bloc, the European Union makes up 28% of both exports and imports. Bulgaria is Georgia's most important EU export destination (10%), while Germany is its most important import origin country (5%). Beyond the EU and its direct neighbours, Georgia also maintains important trading relationships with the People's Republic of China (7% of exports, 9% of imports) and the United States (4.5% of exports, 2.6% of imports).

Figure 3.1. Trade of Georgia



Source: Observatory of Economic Complexity (2017[6]), *Georgia: Exports, Imports and Trade Partners*, Observatory of Economic Complexity, https://atlas.media.mit.edu/en/profile/country/geo/

Investment climate

Georgia has one of the most favourable investment climates in the region, making it an attractive destination for investment. Significant structural reforms have been carried out to simplify business procedures, construction permits, cut red tape, simplify licencing and permitting regimes, as well as to improve tax and customs procedures. Such reforms have not only led to an approximation to EU legislation, but also to a significant improvement in the World Bank Doing Business Indicators. In 2019, Georgia was ranked 6th worldwide, up from 115th in 2005, ranking higher than the United States or the United Kingdom (IBRD, 2019[7]).

The legal basis for regulating domestic and foreign investments is provided by two laws, namely the "Law of Georgia on Promotion and Guarantees of Investment Activity" and the "Law on State Support of Investments" (Government of Georgia, 2006[8]). An investment promotion agency, the Georgian National Investment Agency, has also been established in 2002 to facilitate the investment process by assisting investors in obtaining the required licences and permits, as well as to represent investors at other governmental agencies during licencing and permitting procedures (Grant Thornton, 2018[9]). An online portal,

Invest in Georgia (n.d.[10]), has also been put in place to promote and support potential FDI projects in the country in the area of energy, hospitality and real estate, manufacturing, logistics hubs, agriculture and food processing and business process outsourcing.

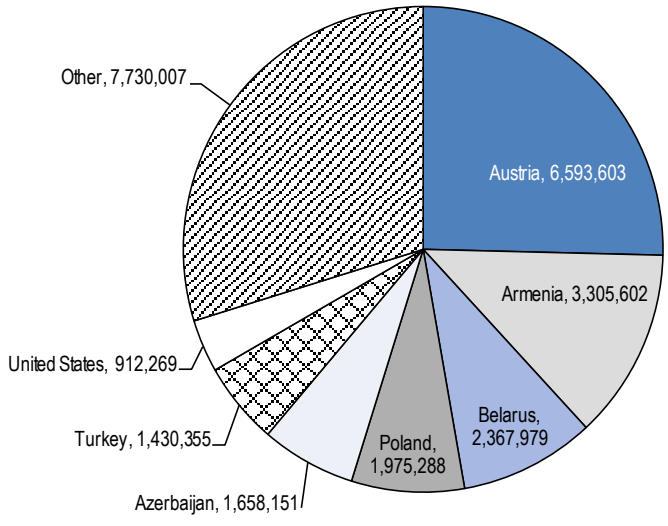
Despite such a favourable investment climate, a large part of the economy is still dominated by low-value industries. According to the EBRD, Georgia is below its innovation potential (EBRD, 2016[11]). For example, at the company level, innovation remains low and technology infrastructure such as broadband and ICT platforms need to be expanded and improved. Further areas of improvement include restructuring the market for land, providing better frameworks for firm exit and restructuring (IBRD, IFC and MIGA, 2018[12]), as well as improving the corporate governance standards for manufacturing and services (EBRD, 2016[11]).

The European Union is an important source of FDI in Georgia. Collectively it invested a total of USD 6.6 billion between 2006 and 2017, which amounts to over 40% of total net FDI in Georgia over that period. Austria, which contributed over 25% of total FDI, and, to a lesser extent, Poland, Denmark and Malta have been Georgia's most important EU investors (see Figure 3.2). Over the past decade, former Soviet Union countries – particularly Armenia, Azerbaijan and Belarus – have also been important sources of foreign investment, accounting for 13%, 6% and 9% respectively. Beyond these two blocs, Georgia's most important investors are Turkey (5%) and the United States (4%). China and Russia, both of which are major investors in other countries in the region, play a smaller role in Georgia, each accounting for just over 3% of FDI in Georgia.

Georgia's public debt was equal to 44.9% of GDP in 2017 and is projected to fall slightly to 43.5% by 2019. Following its third review under the Extended Fund Facility Arrangement, the IMF (2018[13]) assessed Georgia's debt situation as relatively low risk.

Figure 3.2. FDI in Georgia by source country, 2006-2017

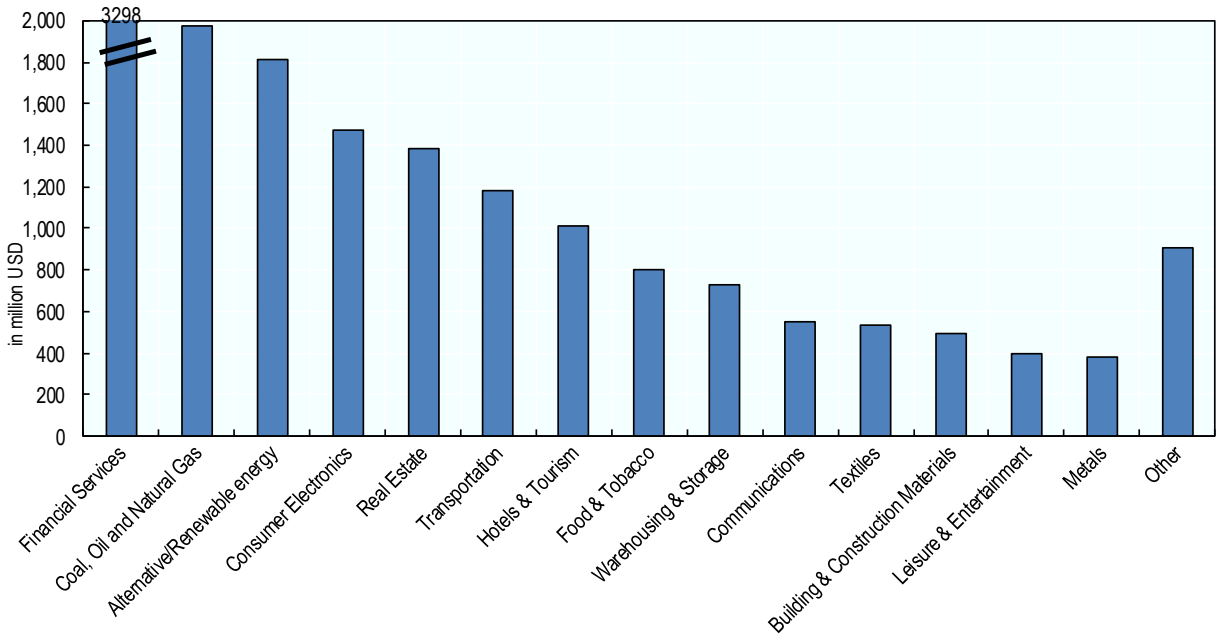
In USD thousands



Source: National Statistics Office of Georgia (2019[14]), *Foreign Direct Investments by Countries*, National Statistics Office of Gerogia, https://www.geostat.ge/en/modules/categories/191/foreign-direct-investments

Georgia has attracted around USD 16.9 billion of announced cross-border greenfield FDI projects between 2003 and 2017, more than Turkmenistan or Mongolia, but significantly less than Azerbaijan and Kazakhstan. Yet, compared to other countries in the region, FDI is more diversified, with no sector that dominates the landscape. Around 19% of FDI goes into financial services, followed by coal, oil and natural gas (12%), and alternative and renewable energy (11%). Infrastructure-related investments have been rather limited. For instance, transportation receives around 7% of total greenfield FDI, or around USD 1.2 billion, while building and construction materials received only around USD 500 million of the total announced greenfield FDI projects in Georgia (Figure 3.3).

Figure 3.3. Greenfield FDI in Georgia by economic activity, 2003-2017



Note: Other includes ceramics and glass, business service, aerospace, business machines and equipment, chemicals, consumer products, rubber, software and IT services, industrial machinery, equipment and tools, automotive components, automotive OEM, pharmaceuticals, healthcare, electronic components, and plastics.
Source: OECD based on fDi Markets (2019[15]), *fDi Markets: the in-depth crossborder investment monitor (database)*, fDi Markets, https://www.fdimarkets.com/

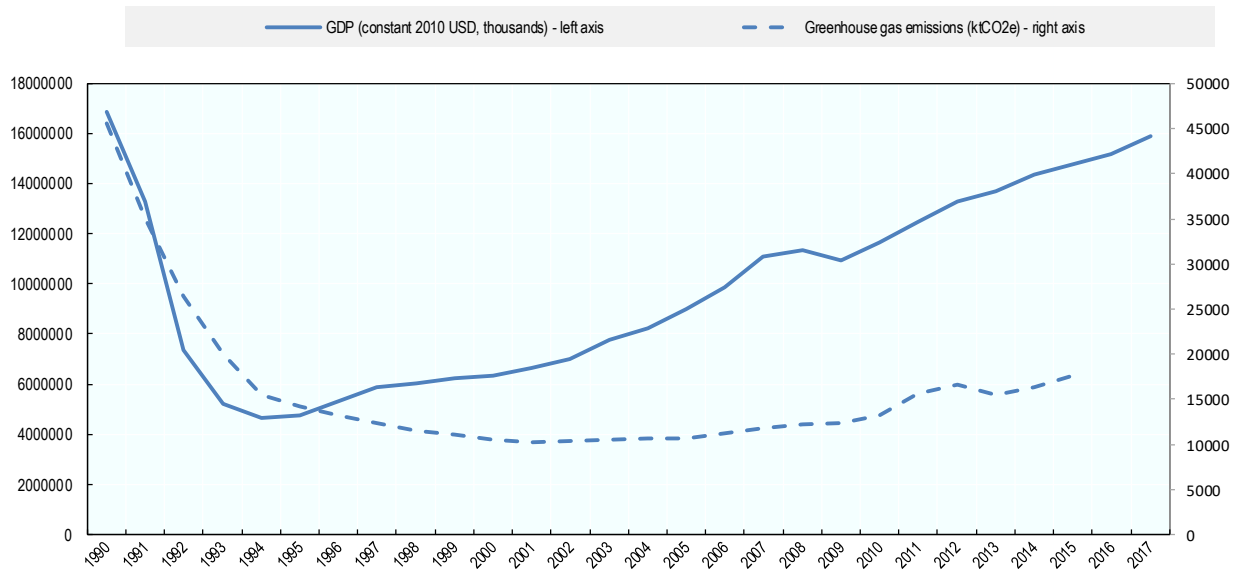
Climate change

Georgia has a relatively low rate of greenhouse gas (GHG) emissions, only being responsible for 0.03% of total global emissions in 2012. Georgia's per capita emissions were a mere 3.8 tCO_2e in 2012, much lower than its 1990 levels of 8.0 tCO_2e, and are among the lowest in Central Asia and the Caucasus (only Tajikistan and the Kyrgyz Republic have lower per capita emissions in the present study). They only amount to about a third of the OECD average (12.9 tCO_2e per capita in 2012) (World Bank, 2019[1]).

In the years following the breakup of the Soviet Union, Georgia's annual GHG emissions plummeted to less than a quarter of their pre-independence levels, from 45 606 $ktCO_2e$ in 1990 to 10 1084 $ktCO_2e$ in 2001. While the country's economic situation initially followed

a similar trend in the early 1990s, Georgia's GDP has since recovered to levels close to its Soviet-era peak while GHG emissions have increased only slightly over the past decade (see Figure 3.4). As a result, the GHG intensity of Georgia's economy (GHG emissions per unit of GDP) fell by more than half, from 2.7 $kgCO_2e$ per USD (constant 2010 dollars) in 1990 to 1.1 $kgCO_2e$ per USD by 2007 before increasing gradually to 1.2 $kgCO_2e$ by 2015. Compared to Central Asia where emissions intensities range from twice to almost four times higher, the Georgian economy is not particularly emissions intensive, but it still emits more than three times as much GHG per unit of GDP as the OECD average (0.35 $kgCO_2e$ per USD in 2012) (Ministry of Environmental Protection and Agriculture of Georgia, 2019[16]).

Figure 3.4. GHG emissions and GDP of Georgia, 1990-2017



Source: GDP data from World Bank (2019[1]), *World Development Indicators (database)*, World Bank, https://datacatalog.worldbank.org/dataset/world-development-indicators; GHG data from Ministry of Environmental Protection and Agriculture of Georgia (2019[16]), *Georgia's Second Biennial Update Report*, https://unfccc.int/documents/196359

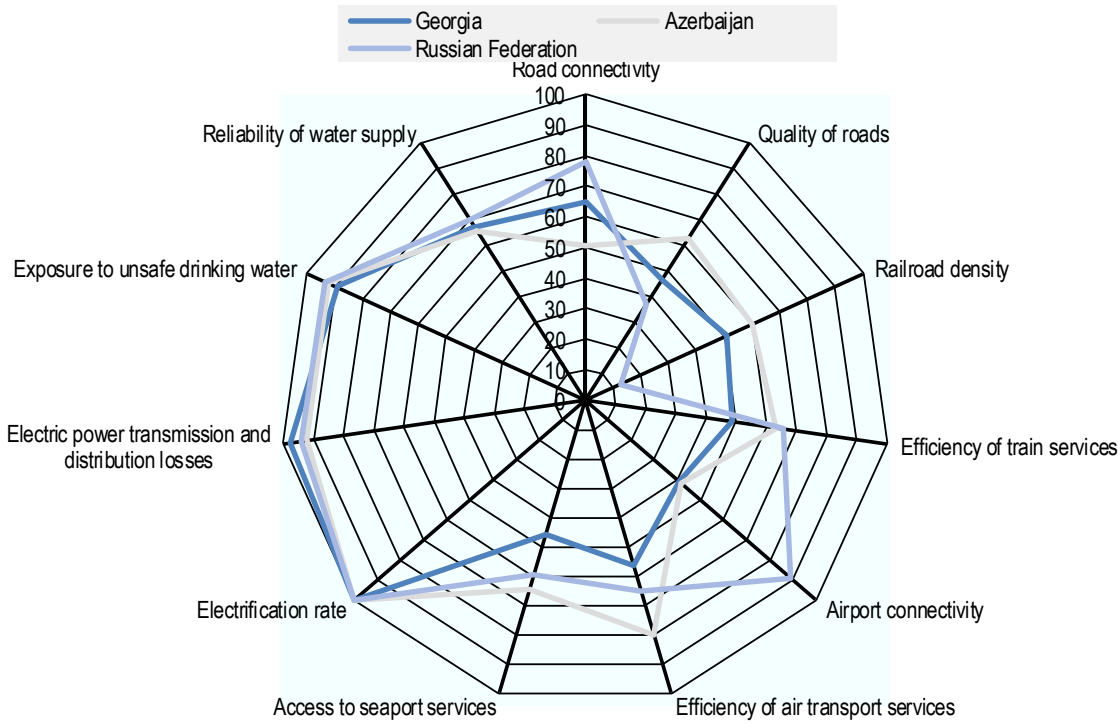
Energy (including fuel combustion for transport) accounts for the majority of Georgia's GHG emissions, at 61.8% in 2015. This share has shrunk compared to 1990 when the energy sector was responsible for 80.5% of emissions. Industrial processes (11.7%), agriculture (18.6%) and waste (7.9%) were responsible for the rest of Georgia's emissions in 2015 (Ministry of Environmental Protection and Agriculture of Georgia, 2019[16]).

Current trends of climate change impacts, such as increasing temperatures, eroding soils and intensifying droughts, floods and hail, are expected to reduce yields in major agricultural regions, such as the eastern region of Kakheti. The incidence of destructive natural disasters such as landslides and mudflows has increased considerably. There were fewer than 10 000 landslide events in Georgia in 1972, but this number has increased to over 50 000 in 2013 (Government of Georgia, 2015[17]).

3.2 Georgia's infrastructure needs and current plans

Georgia's existing infrastructure varies in quality, with relatively high-quality electricity infrastructure and lower-quality transport and water infrastructure (World Trade Organisation, 2015[18]) (see Figure 3.5). The World Bank (2018[19]) identified improving connectivity to foreign markets through both hard infrastructure (e.g. transport links) and soft infrastructure (e.g. institutions) as a priority to boost Georgia's productivity. It also highlighted the importance of preserving Georgia's unique environment, which it calls "one of its greatest economic assets". Georgia's low rank in the Logistics Performance Index (119th out of 160 countries) reflects the shortcomings of Georgia's transportation infrastructure. Although international connectivity has improved in recent years, domestic connectivity remains a barrier to integration into global value chains (World Bank, 2018[19]).

Figure 3.5. Quality of infrastructure in Georgia



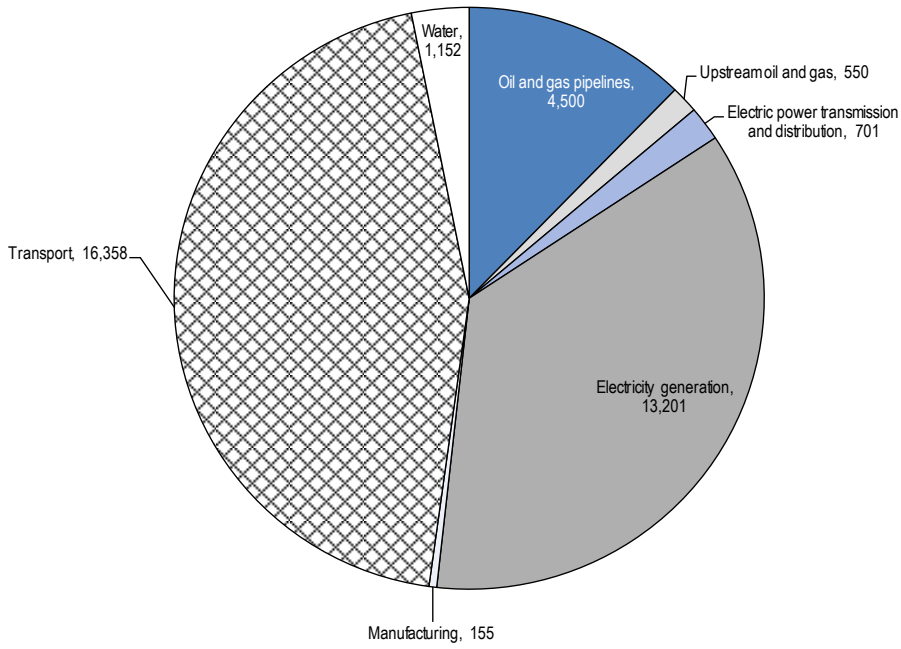
Source: World Economic Forum (2017[20]), *The Global Competitiveness Report 2017-2018*, World Economic Forum, http://www3.weforum.org/docs/GCR2017-2018/05FullReport/TheGlobalCompetitivenessReport2017%E2%80%932018.pdf

The energy sector in particular dominates Georgia's extensive infrastructure plans. Out of the USD 36.6 billion of investments tracked, energy projects account for over 52% (USD 18.9 billion) of projects while transport projects make up 45% with USD 16.4 billion. Finally, water projects only account for 3% (USD 1.2 billion) of investment projects planned and under construction. The energy investments are divided into electricity generation projects accounting of 36% of total investments (or USD 13.2 billion) and oil

and gas pipelines (12% or USD 4.5 billion). Investments in electric power transmission and distribution projects and upstream oil and gas account for 2.4% and 1.9% respectively (see Figure 3.6).

Figure 3.6. Infrastructure projects in Georgia by sector

Planned and under construction in USD million



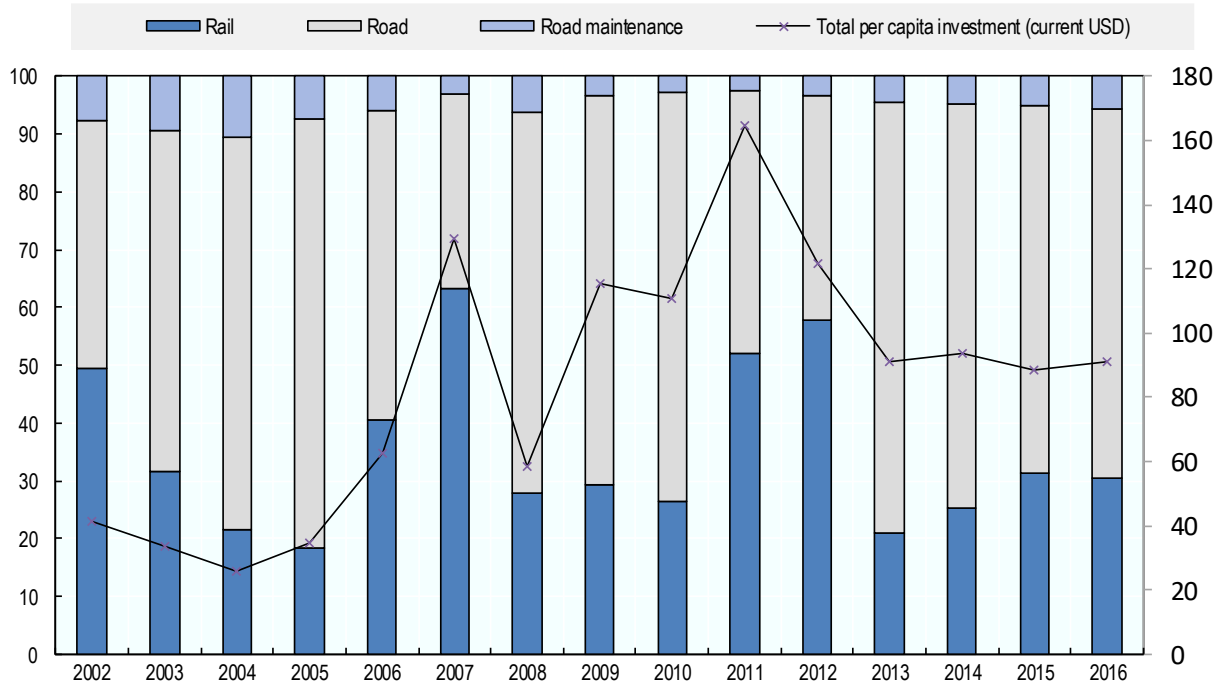
Note: Water projects include water supply and sanitation, irrigation and water management. Oil and gas pipelines include large cross-border gas projects between Georgia, Austria, Azerbaijan, Romania and Turkey. Upstream oil and gas projects include underground storage for natural gas. Electric power transmission and distribution projects include construction of new power transmission lines or strengthening or expansion of the existing ones. Electricity generation projects include hydroelectric power plants, natural gas-fired electric power plants, solar PV projects, and wind power plants. Manufacturing includes upgrade and modernisation of production line for ammonia production. Transport projects include both domestic and cross-border rail and roads, as well as logistics centres.
Source: OECD analysis based on accessed databases as of June 2019.

Transport

Recognising its transport infrastructure's shortcoming, Georgia has increased investment in overland transport infrastructure measured in per capita terms. On average, it invested USD 110 per capita annually between 2007 and 2016, while neighbouring Armenia invested only USD 31 and considerably richer Azerbaijan invested USD 96. Transport investment spending remains slightly lower than in Turkey (USD 114) and significantly lower than in the Russian Federation (USD 146) (ITF, 2019[21]). The modal share of investments between road and rail has fluctuated somewhat cyclically (see Figure 3.7), but the road sector has received the larger share of investment in most years (except 2007, 2011 and 2012).

Figure 3.7. Inland transport infrastructure investment in Georgia (2002-2016)

Modal share (%) of total inland transport infrastructure investment (left axis) and total inland transport infrastructure investment in current USD per capita (right axis)



Source: ITF (2019[21]), *Transport Performance Indicators*, International Transport Forum, https://doi.org/10.1787/2122fa17-en

Georgia's inland transport modal split for freight has shifted towards road over time. In 2005, 91% of the country's freight, measured in tonne-kilometres, moved by rail, but by 2016 rail's share had dropped to 84% (3.4 billion tkm) while road's had risen to 16% (0.7 billion tkm). This trend is misaligned with the country's goals to decarbonise the transport sector, which would require a shift of passenger and goods transport from road to rail and, therefore, increased rail investment. The importance of this modal shift to Georgia's mitigation efforts is expressed in the draft Climate Action Plan, which is currently under development.

The Government of Georgia has made the maintenance of existing road systems a high priority on its agenda, as evidenced by the share of maintenance in total inland infrastructure investments (regularly over 5%). This priority stems in part from the EU Association Agreement and Georgia's efforts to approximate relevant EU directives.

47% of the rail freight by volume passing through Georgia only transits through the country, while imports (25%), exports (10%) and local freight account for the rest (18%) (UNESCAP, 2018[22]). For passengers, the modal shares are reversed: 93% of passenger transport (6.9 billion pkm) occurred by road, compared to only 7% (0.5 billion pkm) by rail (UNECE, 2018[23]).

Georgia has international rail links to Armenia, Azerbaijan and Turkey. Although a railway line has historically existed between Georgia and the Russian Federation, it passes through the breakaway region of Abkhazia, and due to the frozen conflict, train service has been suspended. Its rail company, Georgian Railways, which is the largest employer in the

country, owns rail infrastructure and operates all cargo and passenger service in the country. Georgian Railways is in the process of separating its ownership and operation roles to improve transparency and efficiency, and aims to have done so by 2022 (Benmaamar, Keou and Saslavsky, 2015[24]). The Georgian Partnership Fund (a state-owned investment fund that owns several strategically important companies in the transport and energy sectors) is the company's only shareholder (Georgian Railway, n.d.[25]). The main barriers to increasing the modal share of rail transport in Georgia are ageing, out-dated and primarily single-track railways and a lack of available, quality rolling stock, particularly platform cars (Benmaamar, Keou and Saslavsky, 2015[24]). For instance, due to infrastructure quality shortcomings, country's east-west rail corridor operates at only 33 km per hour (ADB, 2014[26]).

In the road sector, the government plans to develop and improve sub-regional multi-corridors to offer alternative routes between South Caucasus countries and Turkey (ADB, n.d.[27]). Such corridors include the improvement of two corridors: one running east-west between the capital Tbilisi and Turkey via the Autonomous Republic of Adjara (where Georgia's second-largest city Batumi is located) and another north-south corridor from the Russian Federation through Georgia to Armenia. Due to the frozen conflicts in Abkhazia and South Ossetia, the only open border crossing between Georgia and the Russian Federation is at Larsi, just north of Stepantsminda on the S3 highway (the "Georgian Military Road"). While international road links are relatively good, secondary and local roads need upgrading to improve domestic connectivity (World Bank, 2018[19]).

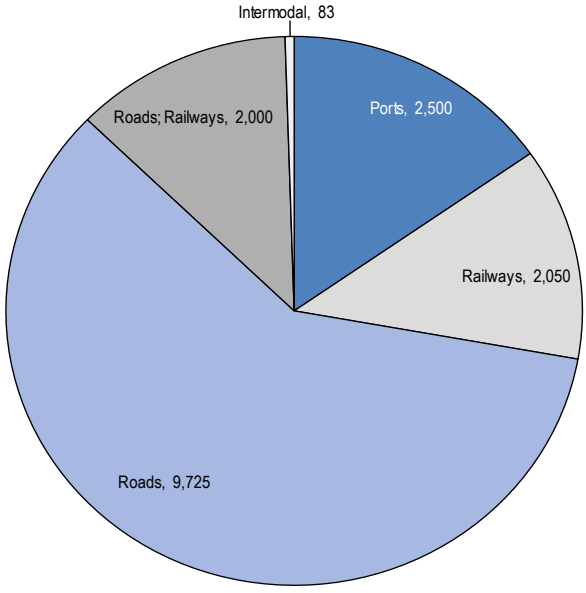
Georgia has several ports along the Black Sea coast, but its international maritime connections are weak. According to the Liner Shipping Connectivity Index, which rates a country's integration into global liner shipping networks on a scale from 0 to 100 (equal to China's connectivity in 2004), Georgia received a score of just 6 in 2017. By comparison, Ukraine and the Russian Federation had scores of 76 and 36 respectively (UNCTAD, 2017[28]).

Given its strategic position between the Black and Caspian Seas and near large markets such as Turkey, Iran, Europe and Russia, Georgia partakes in several international connectivity initiatives. Georgia is a key component of the EU initiative TRACECA (Transport Corridor Europe-Caucasus-Asia), with two key ports on the Black Sea (Poti and Batumi) and well-established rail and road links to the Caspian Sea via Azerbaijan (TRACECA, 2018[29]). CAREC Corridor 2 also passes through Georgia, linking Caspian Sea ports via Azerbaijan and Georgia to Turkey and the Black Sea (ADB, 2017[30]). Other initiatives include the Middle Corridor Trans-Caspian International Transport Route (along with Azerbaijan and Kazakhstan) (TITR, 2019[31]) and the South-West Transport Corridor (along with Azerbaijan and Iran) (Financial Tribune, 2017[32]).

Georgia's planned and current transport infrastructure projects account for around USD 16.4 billion, and consist primarily of roads projects (59% or around USD 7.4 billion) (see Figure 3.8). Although at a much lower level, investments in the ports sector come second at around USD 2.5 billion (or 18%), followed by investments in railways (15% or USD 2.1 billion). There are also large scale, cross-border investments covering both roads and railways for a total of USD 2 billion. Intermodal projects have also received some investments, but the amounts have been very limited, reaching only 1% (or USD 83 million). Most of these projects are regional projects aimed at improving Georgia's connectivity with neighbouring countries and are in line with Georgia's aim to become a regional hub for transportation and logistics.

Figure 3.8. Transport projects in Georgia by sub-sector

Planned and under construction in USD million



Note: Roads and railways include a large-scale project between Afghanistan, Turkmenistan, Azerbaijan, Georgia and Turkey that involves the construction of both rails and roads. Intermodal projects include the construction of logistics centres.
Source: ADB (2019[33]), AIIB (2019[34]), Dealogic (2019[35]), IJGlobal (2019[36]), EaP (n.d.[37]), CSIS (2019[38]), EBRD (n.d.[39]), EIB (2019[40]), Thomson One (2019[41]).

Georgia's transport projects mainly focus on improving the domestic transport network and creating new corridors connecting Georgia by road and railroad with neighbouring countries (Table 3.2). This includes the Georgia Road Corridor Investment Programme, which aims to rehabilitate the domestic transport network and create a sub-regional network that would facilitate trade across the country and with international markets. Another high-impact project is the East-West Highway Corridor (EWHC), where the country is involved in the construction of different sections. The project is a priority of the government's 2014 Action Plan, and carries over 60% of the country's international trade. Improved connectivity and access to global markets as well as to increase revenue from freight transit and logistics are considered essential for Georgia's further integration into the global economy. The project is also aligned with the EU Association Agreement and will play a crucial role in reducing poverty and vulnerability in rural and remote areas by connecting people with services, and jobs, export markets and other opportunities (IBRD, IFC and MIGA, 2018[12]). Such projects aimed at developing multi-corridors at the sub-regional level are in line with the government's objective to make the economy a transit hub for the Caucasus and Euro-Asian road transport, thereby stimulating Europe-Asia trade links (ADB, n.d.[27]).

Table 3.2. Hotspot projects in the transport sector in Georgia

(a) Under construction					
Name	Sub-sector	Description	Project value (USD million)	Funding source	Type of investment
Road Corridor Investment Program	Road	Improve between 120 to 200 km of sub-regional roads across the country Improve the sub-regional road network and create a trade corridor.	2 333	ADB; Government of Georgia (unspecified)	Greenfield
East-West Highway (E60 Tbilisi-Senaki-Leselidze): Section Chumateleti - Argveta	Roads	Construction of 60 km of road on the East-West highway. The project is of regional significance as it is the main corridor for transit through Georgia. A feasibility study was completed in 2014 and the implementation is planned for 2017-2020.	820	Ministry of Regional Development and Infrastructure of Georgia with financial support from multi-donors (unspecified)	Brownfield
Marabda-Kartsakhi Railway (Construction and Rehabilitation)	Railways	First railway bridge to be constructed in Georgia after the collapse of the Soviet Union. Kartsakhi will be connected to Turkey by the tunnel with 4.4 km length.	775	State Oil Fund of Azerbaijan (SOFAZ).	Greenfield; Brownfield
Baku-Tbilisi-Kars new railway line	Railway	Rehabilitation and construction of a 154 km railway between Marabda and Akhalkalaki and the construction of a new 25 km railway between Akhalkalaki and Kartsakhi, by the Turkish border. The project will provide a new corridor connecting Georgia with Azerbaijan and Turkey.	775	Not specified	Greenfield; Brownfield
East-West Highway (Khevi-Ubisa Section) Improvement Project	Roads	Construction of a 12 km road network between Khevi and Ubisa along the East-West Highway. The result is improved efficiency and safety of road transport along the East-West highway.	570	ADB; Japan International Cooperation Agency; World Bank; European Investment Bank	Brownfield
(b) Planned					
Name	Sub-sector	Description	Project value (USD million)	Funding source	Type of investment
Anaklia Deep Sea Port	Port	Development of a port in Anaklia, Samegreo-Zemo Saneti Region, Western Georgia, on the Black Sea coast. The construction will be conducted in different phases, each time increasing the annual capacity, potentially up to 100 million tonnes once the port reaches the highest capacity. The port is expected to be able to receive Panamax and post-Panamax vessels loaded with at least 6 500 containers. The expected timeline for Phase 1 is 2017-2020.	2 500	Ministry of Economy and Sustainable Development of Georgia, Anaklia Development Consortium LTD (TBC Holdings and Conti Group).	Greenfield
Afghanistan-Turkmenistan-Azerbaijan-Georgia-Turkey Corridor	Road; Railways	Construction of railways and roads connecting the city of Turgundi in the Afghan province of Herat with Ashgabat and Turkmenbashi port in Turkmenistan.	2000	Governments of Afghanistan; Turkmenistan; Azerbaijan;	Greenfield

		The project is expected to foster intra-regional trade and economic integration.		Georgia and Turkey	
Marabda to Akhalkalaki Railway Project	Railway	Reconstruction and rehabilitation of the Marabda-Akhalkalaki railways with an operational length of 153 km. (announced in 2007)	400	Marabda-Kartsakhi Railroads	Brownfield
Tbilisi Bypass	Roads	Construction of a 55 km stretch of four lane-roads. The project is part of Georgia's master plan for transport. The project is planned to be implemented between 2018-2020. A feasibility study is currently ongoing.	350	ADB	Brownfield

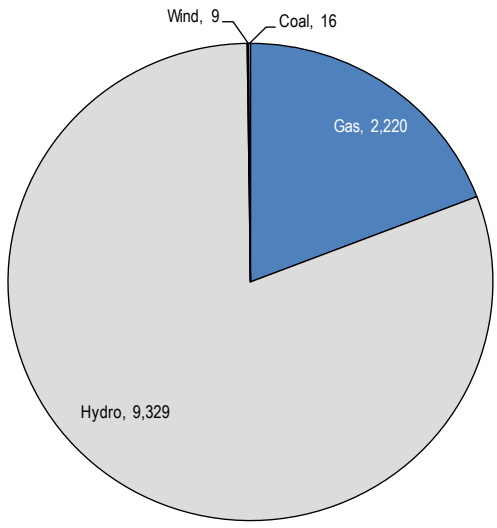
Note: Refer to the Preamble for the present report's definition of 'hotspot' and other information on how the projects above were selected and prioritised.
Source: ADB (2019[33]), AzerNews (2018[42]), CSIS (2019[38]), EIB (2019[40]), EaP (n.d.[37]), IJGlobal (2019[36]), Thomson One (2019[41])

Energy

The overall quality of Georgia's energy infrastructure is good, matching or surpassing the performance of wealthier neighbours such as Azerbaijan and the Russian Federation. Georgia's transmission and distribution systems are relatively efficient, leading to losses of only 7.3% of electricity output in 2017 compared to 9.7% in the Russian Federation and 9.7% in Azerbaijan (IEA, 2019[43]). Although Georgia has limited domestic oil and gas reserves, several important pipelines pass through Georgia between oil-rich Azerbaijan and Turkey, including the Baku-Tbilisi-Ceyhan (BTC), Baku-Tbilisi-Erzurum (BTE) and the Trans-Anatolian Natural Gas Pipeline (TANAP) (Emerging Markets Forum, 2019[44]).

Georgia's electricity generation relies primarily on hydroelectric dams, which produce 81% of the country's power, with the remainder coming from gas-fired thermal power plants (see Figure 3.9). Only 60% of Georgia's installed hydropower capacity generates electricity due to several hydroelectric power plants needing to undergo a rehabilitation process, and the country currently only exploits one fifth of its total hydropower potential (Chechelashvili, 2007[45]). The country's largest hydroelectric power plant, Enguri, which generates a third of all electricity in Georgia (Business Association of Georgia, 2016[46]), straddles the border of Abkhazia, one of Georgia's breakaway regions. Although an informal agreement between Georgia and Abkhazia initially split output (40% to Abkhazia, 60% to the rest of Georgia), Abkhazian consumption has increased considerably and, in the winter months, now surpasses Enguri's output. Abkhazia does not pay for its consumption, and the situation is a risk to Georgia's energy security and a drain on its budget (World Experience for Georgia, 2017[47]).

Figure 3.9. Electricity generation by fuel (GWh, 2016)



Source: International Energy Agency (2018[48]), *IEA World Energy Balances 2018*, https://webstore.iea.org/world-energy-balances-2018

Compared to hydrocarbon-rich Azerbaijan or the Russian Federation, Georgia's energy security situation is more precarious. Its domestic energy production covers only one third of demand, and its limited oil and natural gas production covers only a small fraction of consumption (IEA, n.d.[49]). It is a net importer of coal (0.16 Mtoe in 2016), oil (1.45 Mt in 2016), natural gas (1.89 Mtoe in 2016) and, in most years, electricity (IEA, 2018[48]). Despite Georgia's limited oil and natural gas reserves, the government has set targets to increase annual oil and natural gas production to 3 million tonnes and 2 billion m^3 respectively by 2020 (UNECE, 2016[50]).

Since joining the EU's Energy Community in 2017, Georgia has made considerable progress on implementing the necessary legislation across various policy areas. Implementation is particularly advanced on statistics (93%) and, to a lesser extent, environment (49%) and renewable energy (35%), while implementation is in the beginning stages on oil (8%), gas (15%) and infrastructure (17%). Georgia's grid is not currently connected to any other Contracting Party of the Energy Community nor to any EU Member State (Energy Community, 2019[51]).

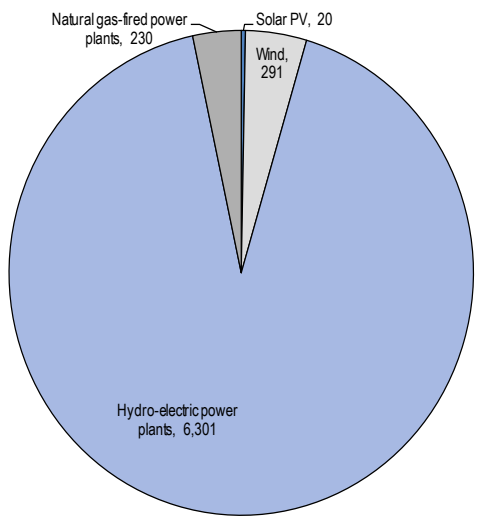
Georgia has considerable potential for non-hydroelectric renewable electricity generation, and the diversification of electricity sources is a priority of the government. In *Freedom, Rapid Development and Prosperity: Government Platform 2016-2020* (see section 3.3 on Georgia's strategic documents), the government has made improving energy security one of its main priorities, and it aims to do so by gradually weaning the country off energy imports and developing locally available energy resources (Government of Georgia, 2016[52]). Its geothermal potential, for example, is estimated at 3 terawatt hours (TWh) per year. Although Georgia has begun using geothermal water for heating and certain agricultural and industrial applications, it does not currently have any geothermal electricity generation capacity. Georgia also has 60-120 GWh of solar energy potential, but major

seasonal variations make them less reliable for improving energy security (UNECE, 2016[50]).

Georgia's current and planned energy investments are in line with the government's plans to increase the capacity of hydropower projects for electricity generation. Although it is not yet adopted, Georgia's Long-Term Low-Emission Development Strategy (LT-LEDS) aims to increase the share of power generation from hydro in domestic electricity consumption to at least 85% and install 150 MW of wind power generation by 2030 (United States Agency for International Development, 2017[53]). Over 92% of electricity generation projects by capacity are in hydropower, while wind power plants only account for 4% of the total electricity generation projects (see Figure 3.10). With around 300 rivers that are economically viable for hydropower projects, which today remains largely untapped, Georgia has one of the most significant hydropower potential for investors. It has a total capacity to generate 15 000 MW, which exceeds the capacity of existing hydro plants in the country by five times. Such potential is also confirmed by a consistent growth of FDI in the energy sector, which received an average of 12% of total FDI in the country over the past five years (Georgian Co-Investment Fund, n.d.[54]). By 2020, the government aims to further attract investments in the energy sector of over USD 1.1 billion and develop at least 500 MW of installed capacity (Government of Georgia, 2016[52]).

Reliance on hydroelectric power is not without its drawbacks. The electricity generation potential of hydroelectric power plants is vulnerable to the effects of climate change as glaciers melt and precipitation patterns change. Moreover, hydroelectric power plants have a large, direct impact on the environments in which they are built; this is also true of small hydro plants, the cumulative effects of which can be considerable.

Figure 3.10. Electricity generation projects in Georgia, by fuel



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

Most of Georgia's energy projects are in hydropower, in line with its goal to further develop its hydropower potential (Table 3.3). Such high-impact projects have been mainly undertaken by the private sector, but development partners such as the EBRD and the ADB have also supported such investments. Significant projects under construction include the

Tskhenistskali cascade of hydropower projects, Adjaristsqali, and Shuakhevi HPPs. One of the projects, the Shuakhevi HPP plant, which is being developed by Tata Power from India with support from the International Finance Corporation, will be the first hydropower project in Georgia to be certified by the UN Framework Convention on Climate Change to reduce carbon emissions by 200 000 tonnes per year. Together, such projects have a capacity of over 859 MW and contribute significantly to the annual output of the total electricity consumption in Georgia. Other significant planned projects include the 280 MW Nenskra HPP, which is designed to meet up to 12% of the country's total domestic demand for electricity (IBRD, IFC and MIGA, 2018[12]). Currently, more than 60 potential hydropower projects are currently at the pre-feasibility study stage (KPMG, 2016[55]). Many of these are small hydro projects[1], which if properly designed and operated can contribute to the country's renewable power capacity with a smaller environmental impact compared to large-scale hydroelectric dam projects.

Table 3.3. Hotspot projects in the energy sector in Georgia – under construction

(a) Under construction						
Name	Sub-sector	Description	Project value (USD million)	Capacity	Funding source	Type of investment
Tskhenistskali cascade of hydropower plants	Hydropower	Two hydropower plants on the Tskhenistskali River. The plants have an installed capacity of 312 MW and an expected annual energy generation of 1 192 GWh. The annual output of these plants comprises 9.4% of the entire electricity consumption of Georgia.	534	312	Georgian Co-Investment Fund	Greenfield
Shuakhevi Hydropower project	Hydropower	installed capacity of 185 MW and an annual energy generation of approximately 452 GWh on the Adjaristsqali River in south-western Georgia. The plant is expected to be able to store water for up to 12 hours and sell electricity at times of peak demand. The construction of the project started in 2014.	417	185	Tata Power, Clean Energy Investment, International Finance Corporation.	Greenfield
Oni Cascade Hydropower Project	Hydropower	Two new hydropower plants on the Rioni River in north-western Georgia, with an installed capacity of 177.2 MW and the plants expected annual energy generation in total is 788.6 GWh. The Oni cascade of hydropower plants annual output makes up 6.2% of Georgia's total electricity consumption.	330	177	Georgian Co-Investment Fund and Peri ltd.	Greenfield
Adjaristsqali Hydropower Plant Project	Hydropower	greenfield run-of-the-river project with an installed capacity of 185 MW. The project is anticipated to increase Georgia's hydropower capacity as well as increasing cross-border trading in the region. The construction started in 2015.	284	185	ADB; Canadian Climate Fund for the Private Sector in Asia	Greenfield
Black Sea Energy Transmission System	Electric power transmission and distribution	Extension of the Georgian electric system to a new 500 kV substation in proximity with the Turkish border at Akhaltsikhe. The project will increase energy security and provide a balance between demand and supply from west to east Georgia. Construction of the project started in 2009 and it is co-financed by the European Investment Bank and KfW.	260	N/A	EBRD; EIB; KfW; Government of Georgia (unspecified)	Brownfield
(b) Planned						

Name	Sub-sector	Description	Project value (USD million)	Capacity	Funding source	Type of investment
Khudoni HPP	Hydropower	Power plant on the Inguri River with a capacity of over 702 MW. It is expected that the plant will allow two other existing dams, the Enguri HPP and Vardnili HPP to generate additional energy needed during the rest of the year. The project will account for over 16% of Georgia's hydropower generation. Its construction stopped in 1989 due to the collapse of the Soviet Union and protests over environmental concerns. The project is highly controversial as it is expected that it will displace around 2 000 people (of the 12 000 who live in Upper Svaneti), while a village with 800 inhabitants will be fully resettled.	1 200	702	Not specified	Brownfield
Nenskra Hydropower Plant	Hydropower	The Nenskra Hydropower plant has a planned capacity of 280 MW and is located in the mountainous Svaneti Region. The project is Georgia's most advanced hydropower installation in the Upper Svaneti region. It is expected to increase the country's power generation capacity during the year, reduce pollution, as well as imports of electricity from neighbouring countries.	1 100	280	AIIB; ADB; EBRD; EIB; KDB; Private sector	Greenfield
Namakhvani Hydropower Cascade Project	Hydropower	Construction of two hydropower plants on the Rioni River, the Lower and Upper Namakhvani hydropower plants, each with a capacity of 333 and 100 MW respectively and a total estimated annual production of 1 514 GWh. The project will contribute to Georgia's objectives to achieve an hourly day-ahead balancing market for electricity by 2020. Planning started in 2016.	730	433	Clean Energy Group (Norway) Enka Insaat ve Sanayi AS (Turkey)	Greenfield
Tskhinvali Hydropower Project	Hydropower	Hydropower project in Tskhinvali city. A feasibility study of the project was carried out in 2015. Further information on the project is not yet available.	723	N/A	Not specified	Greenfield
Atskuri Dviri Da Sakuneti Heseb Hydropower Project	Hydropower	Construction of three hydro stations in Niala (81.6 MWe), Khertivisi (81.6 MWe) and Aspindza (55.2 MWe) for a total of USD 604 million. This is a priority project promoted by the Georgian Ministry of Energy.	604	219	Not specified	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
Source: OECD analysis based on accessed data from ADB (2019[33]), AIIB (2019[34]), BloombergNEF (n.d.[56]) CSIS (2019[38]), EBRD (n.d.[39]), EIB (2019[40]), ENKA (n.d.[57]), IJGlobal (2019[36]), Dealogic (2019[35]), Georgian Co-Investment Fund (n.d.[54]), Invest in Georgia (n.d.[10]), KfW (n.d.[58]), Ministry of Energy of Georgia (n.d.[59]), Thomson One (2019[41]),World Bank (2019[60]) as of June 2019.

Water

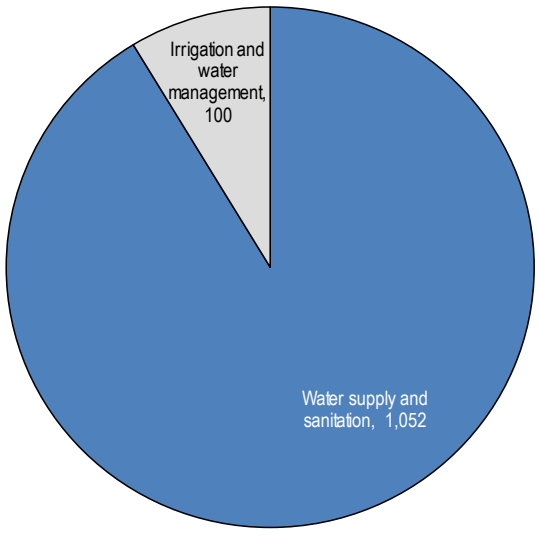
Georgia is currently facing significant water resource challenges. In particular, there are concerns that, in the long run, Georgia's glaciers will be affected by climate change, leading to significant reductions of water surplus. The country is already experiencing significant variability in precipitation and surface run-off of water, and these are projected to be more severe in the coming years (EBRD, 2016[11]). Droughts are also expected to put further pressure on water availability. The government has developed an urban water supply and

sanitation sector development program with plans to invest USD 1.6 billion to ensure water supply and sanitation services to all of its urban residents by 2020 (ADB, n.d.[61]).

Current and planned water projects amount for around USD 1.2 billion and they are mostly focused on water supply and sanitation projects (91%), while only one project worth USD 100 million focuses on irrigation and water management to improve the delivery of irrigation and drainage services in selected areas covered by the project (World Bank, n.d.[62]). Relevant water supply and sanitation projects include an Asian Development Bank-financed program to further upgrade the water and sanitation services in a number of secondary towns, including in Zugdidi, where 84% of the people do not have access to piped water (ADB, 2014[63]).

Figure 3.11. Water projects in Georgia by sub-sector

Planned and under construction in USD million



Note: Irrigation and water management includes irrigation and land market development.
Source: ADB (2019[33]), Dealogic (2019[35]), World Bank (2019[60]), KfW (n.d.[58]), EIB (2019[40]).

3.3 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

Georgia is in need of coherent long-term development strategies, having not adopted a single strategy that lays out its vision for economic development beyond 2020. In 2014, Georgia adopted its *Socio-economic Development Strategy – "Georgia 2020"* (see Table 3.4), which aimed to more than double 2013 levels of per capita GDP and boost exports. It did not, however, articulate a clear vision of the infrastructure investments needed to support long-term sustainable growth; it only mentions the important role of transport infrastructure in trade facilitation and the country's goal to improve energy security. In

developing a strategic vision for economic development beyond 2020, Georgia should set ambitious, measurable targets with clear ministerial responsibility and define the scope and nature of infrastructure investments that will be required.

Georgia's only other adopted strategic documents on economic development, include its *Government Platform 2016-2020* and *Freedom, Rapid Development and Welfare: Government Programme for 2018-2020*, which expand on the country's priorities in the near term, but they do not contain quantitative, time-bound targets nor do they delegate responsibility for progress on government priorities.

Furthermore, Georgia currently has no strategic document detailing the country's trajectory towards the Paris Agreement's mid-century climate change goals. USAID (2017[53]) has been helping Georgia develop a long-term low-emission development strategy since 2013 and has published a draft with measurable goals to 2030 for key sectors (energy, transport, industry, agriculture, LULUCF), but the government has not formally adopted it. Unlike all long-term low-emission development strategies that parties have communicated to the UNFCCC, Georgia's draft strategy looks only to 2030, not to 2050. Georgia should consider following Ukraine's example, being the first and, to date, only former Soviet Union country to submit a long-term low-emission development strategy with 2050 goals to the UNFCCC (2019[64]).

Georgia is in the process of updating its NDC, which it plans to submit by the end of 2019. The government is also developing its first Climate Action Plan, which will act as an implementation tool to achieve its NDC's mitigation and adaptation targets. Georgia has made considerable progress towards integrating the 2030 Agenda and the SDGs into a national context with the development of its national SDG matrix.

At the local level, 23 municipalities have stepped up to join the Covenant of Mayors, an EU initiative, to commit to reducing GHG emissions by 20-30% by 2020 and 2030. Through the same initiative, several municipalities have also developed Sustainable Energy Action Plans (SEAPs).

In parallel, Georgia is developing a green economy strategy with support from GIZ, UNEP and the OECD through the "Greening Economies in the Eastern Neighbourhood" (EaP GREEN) programme. The strategy will articulate the country's plans to transition towards a greener economy following its adoption of the 2009 OECD Declaration on Green Growth (Agenda.ge, 2017[65]). However, the strategy is still awaiting adoption.

In order to develop the country's energy sector, Georgia has contracted the consulting firm McKinsey & Company to aid with the production of an energy development strategy, but nothing has been formally adopted (Agenda.ge, 2018[66]). The absence of a national energy strategy and supporting policies makes it difficult to assess energy projects' compatibility with national supply and demand trends as well as energy security concerns and long-term environmental objectives (UNECE, 2016[50]).

Other key sectors, like transport and industry, lack strategies to guide infrastructure development. Although Georgia has adopted transport-related strategies such as its *National Road Safety Strategy* (UNECE, 2016[67]) and the *Tbilisi Sustainable Urban Transport Strategy* (Municipal Development Fund of Georgia, 2015[68]), there is still no national transport development strategy with goals relating to transport infrastructure development. Georgia has adopted its *SME Development Strategy 2016-2020* (Ministry of Economy and Sustainable Development of Georgia, 2015[69]), but does not have strategies relating to industry or mining.

Institutional set-up and decision making processes

Georgia ranked 6th globally in 2019 on the World Bank Group's Ease of Doing Business Index, which measures protection of property rights and investors and the quality of business regulations (IBRD, 2019[7]). By comparison, the country ranked 100th in 2006. Georgia's impressive pace of pro-business reforms have made the country a leader in the region in terms of market liberalisation and attracting FDI. Georgia has also made considerable progress on involving the private sector in infrastructure development by elaborating a regulatory framework for public-private partnerships (PPPs), but government bodies responsible for managing infrastructure face major capacity constraints. To analyse risks effectively and develop, screen and implement infrastructure projects, the institutional capacity of government bodies in infrastructure development need to be strengthened (World Bank, 2018[19]).

The government needs to also better assess environmental impact assessments (EIAs), while EIAs are required for new and existing infrastructure projects, current procedures and the quality of reports do not comply with international standards (UNECE, 2016[50]). The government recognises this shortcoming: both Georgia-2020 and Freedom, Rapid Development & Welfare: Government Programme for 2018-2020 state that Georgia aims to adopt transparent procedures for assessing the environmental impacts of infrastructure projects.

List of relevant strategic documents

Table 3.4. Main strategic documents in force

	Status	Time Horizon	Sectoral Coverage	Main objectives
First Nationally Determined Contribution (NDC)	Submitted in 2017	2017-2030	Economy-wide	• Unconditional Target: to reduce greenhouse gas emissions by 15% below the business as usual scenario for 2030, this is equal to a reduction in emission intensity per unit of GDP by approximately 34% from 2013-2030. • Conditional Target: to reduce greenhouse gas emissions by 25%, this is equal to a reduction in emission intensity per unit of GDP by approximately 43% from 2013-2030. • Main sectors for emission reduction: Energy (transition to renewable energy), Industry (introduction of new technologies), Agriculture/Water (efficient management and policy making) • Adaptation priorities: introduce innovative irrigation management and water application techniques, implement coastal zone protection technologies, implement list of strategic documents/policies
Socio-Economic Development Strategy – "Georgia 2020"	Adopted in 2014	2014-2020	Governance, Energy, Transport, Water, Industry	• Minimize state interference in the private sector, state intervention only where private sector is inefficient • Develop transport infrastructure to boost trade, specifically exports • Improve irrigation and drainage infrastructure

				• Ensure a stable and accessible energy supply in the future, reducing dependency on external energy sources • Develop ecosystem services by improving management (e.g. sustainable management in the forestry sector)
Freedom, Rapid Development and Prosperity: Government Platform 2016-2020	Adopted in 2016	2016-2020	Governance, Energy, Transport, Water, Industry	• Improve monitoring of government processes and increase public engagement • Improve energy security, in turn reduce energy imports • Further strengthen the private sector (e.g. develop tax incentives) • Develop human capital, with higher education targeted towards the needs of the economy • Develop road networks and public transit, helping develop tourism
Freedom, Rapid Development and Welfare: Government Programme for 2018-2020	Adopted in 2018	2018-2020	Governance, Energy, Transport, Water, Industry	• Economic development based on principles of a free market economy • Aim to maintain the ratio of public debt to GDP at a stable level • Fully engage in international economic processes and attract FDI • Utilize local energy resources and diversify energy supply sources • Develop multi-modal transport and create logistics centres which are in line with international standards • Introduce modern technology and innovation to industrial production methods • Long-term aim to fully integrate Georgia into the EU
SME Development Strategy 2016-2020	Adopted in 2015	2016-2020	Governance, industry	• Enhance competitiveness of SMEs in both domestic and international markets • Improve the skills of SMEs and develop a modern entrepreneurial culture • Ensure the improvement of the technological ability of SMEs • Aim to increase SMEs output by 10% annually by 2020 • Increase the number of employees in SMEs by 15% • Increase the productivity of SMEs by 7%
National Biodiversity Strategy and Action Plan of Georgia 2014-2020	First adopted in 2005	2014-2020	Governance, Energy, Transport, Water, Industry	• Aim to inform at least 50% of the population about the importance of biodiversity • Ensure that the sustainable use of ecosystem services is incorporated into national legislation • Actively introduce environmental policies in line with climatic change
National Security Concept of Georgia	Adopted in 2018	No defined timeframe	Governance	• Promote the development of a free, democratic society and strengthen the rule of law • Increase transparency at all levels of government • Ensure environmental security nationally and sub-nationally

				• Improve relations with the Russian Federation • Develop economic cooperation and trade with the United States
Strategy for Agricultural Development in Georgia 2015-2020	Adopted in 2015	2015-2020	Water	• Promote more efficient and modern technologies in irrigation and drainage systems • Create a database to collect data on the negative effects of climate change • Promote climate smart agricultural practices to ensure resilience in the agricultural sector
Rural Development Strategy of Georgia 2017-2020 and Rural Development Strategy Action Plan 2017-2020	Adopted in 2017	2017-2020	Agriculture, Tourism, Environment	• Modernise agricultural activities and diversify rural economies • Improve rural infrastructure and waste management systems
"Produce in Georgia"	Adopted in 2014	No defined timeframe	Industry	• Aim to inject USD 27 million into production industries • Promote the development of the industrial sector (e.g. building materials, car building, textiles, electric accessories)
National Road Safety Strategy	Adopted in 2015	2015-2020	Transport	• Ensure the construction of adequate road infrastructure in line with international standards • Ensure cooperation between various ministries in addressing the issues of road infrastructure and transport • Control the number of motor vehicles in use

Table 3.5. Other relevant documents

	Status	Time Horizon	Sectoral Coverage
Regional Development Strategy of Georgia for 2010-2017	Adopted in 2010	2010-2017	Multi-sector
Action Plan for the Implementation of DCFTA for 2014-2017	Adopted in 2014	2014-2017	Multi-sector
National Environmental Action Programme of Georgia for 2012-2016	Adopted in 2012	2012-2016	Multi-sector
National Strategy and Action Plan on Environmental Education for Sustainable Development 2012-2014	Adopted in 2012-2014	2012-2014	Multi-sector
Long-Term Low-Emission Development Strategy (LT-LEDS)	Drafted in 2013, Not adopted	2013-2030	Multi-sector
Green Economy Growth Strategy	Not adopted	No defined timeframe	Multi-sector
Energy Development Strategy	Not adopted	No defined timeframe	Energy
Government Action Plan for the Reduction of Environment Pollution from the Transport Sector in Georgia	Under development	No defined timeframe	Transport
National Action Plan to Combat Desertification	Under development	No defined timeframe	Multi-sector
Waste Management National Strategy and Waste Management National Action Plan	Under development	No defined timeframe	Waste

Notes

[1] The definition of small-scale hydro varies widely from country to country, ranging from less than 50 MW (Canada, China) to less than 1.5 MW (Sweden) (IEA, 2012[71]). In Georgia, the government defines small hydro as power plants with a generation capacity between 1 MW and 13 MW; smaller plants are mini (100 kW-1 MW) and micro (up to 100 kW) (Ministry of Energy of Georgia, 2016[70]).

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Chapter 4. Trends in Kazakhstan's sustainable infrastructure investments

This chapter describes sustainable infrastructure planning in Kazakhstan and presents current trends in investment in large-scale infrastructure projects. It compares Kazakhstan's infrastructure plans in the energy, transport, industry and water sectors against its international commitments under the Paris Agreement on climate change and the Sustainable Development Goals (SDGs). The chapter also explores Kazakhstan's strategic documents for long-term economic development, sectoral development and the environment, including those related to climate change mitigation and adaptation. It identifies misalignments between stated goals and observed investment flows and provides recommendations to improve strategic planning for sustainable infrastructure.

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]).

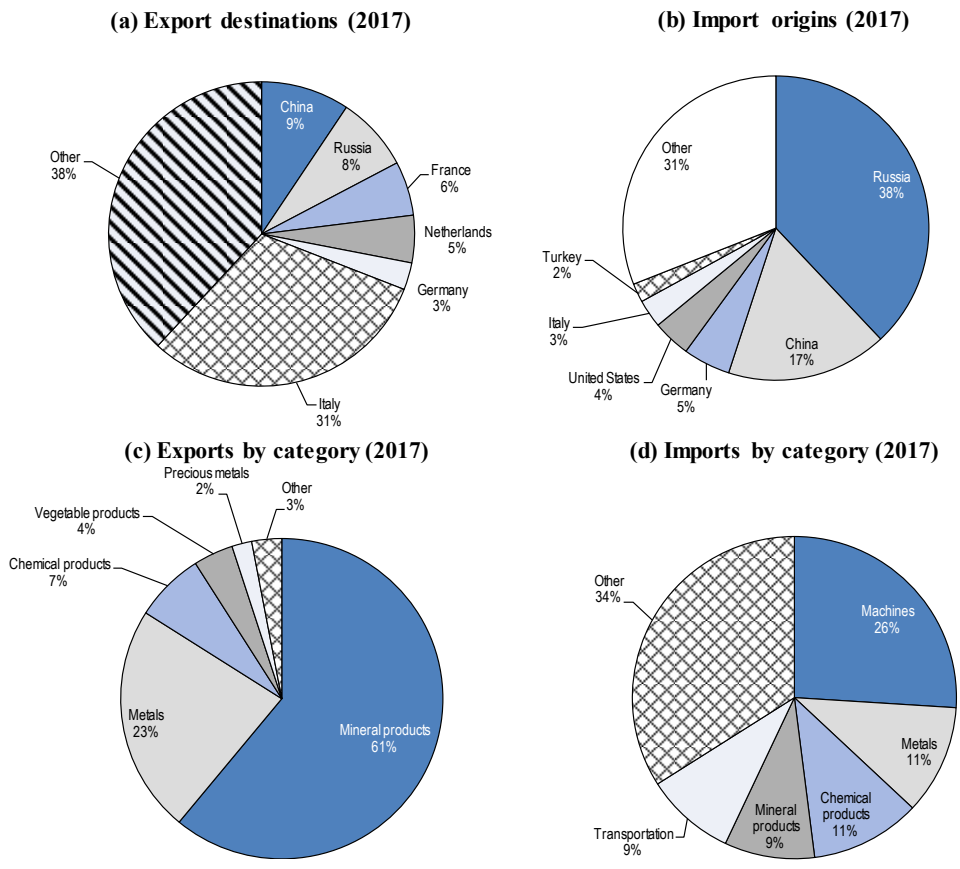
Although the country's post-independence population contracted throughout the 1990s, its population surpassed its 1991 peak of 16.5 million in 2011 and has since grown to over 18 million, and given its fertility rate of over 2.7 births per woman it is expected to grow further (World Bank, 2019[1]). At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

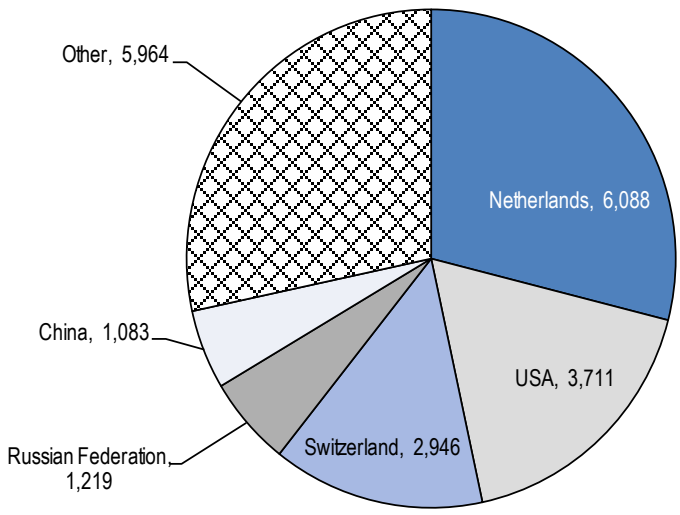
Kazakhstan is a net exporter with a positive trade balance of USD 13.6 billion in 2017 (Observatory of Economic Complexity, 2017[3]). Crude petroleum is by far the country's largest export at 45% of total exports by value. Extractives dominate Kazakhstan's exports with mineral products (including crude 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

Gross FDI in 2017 in USD million

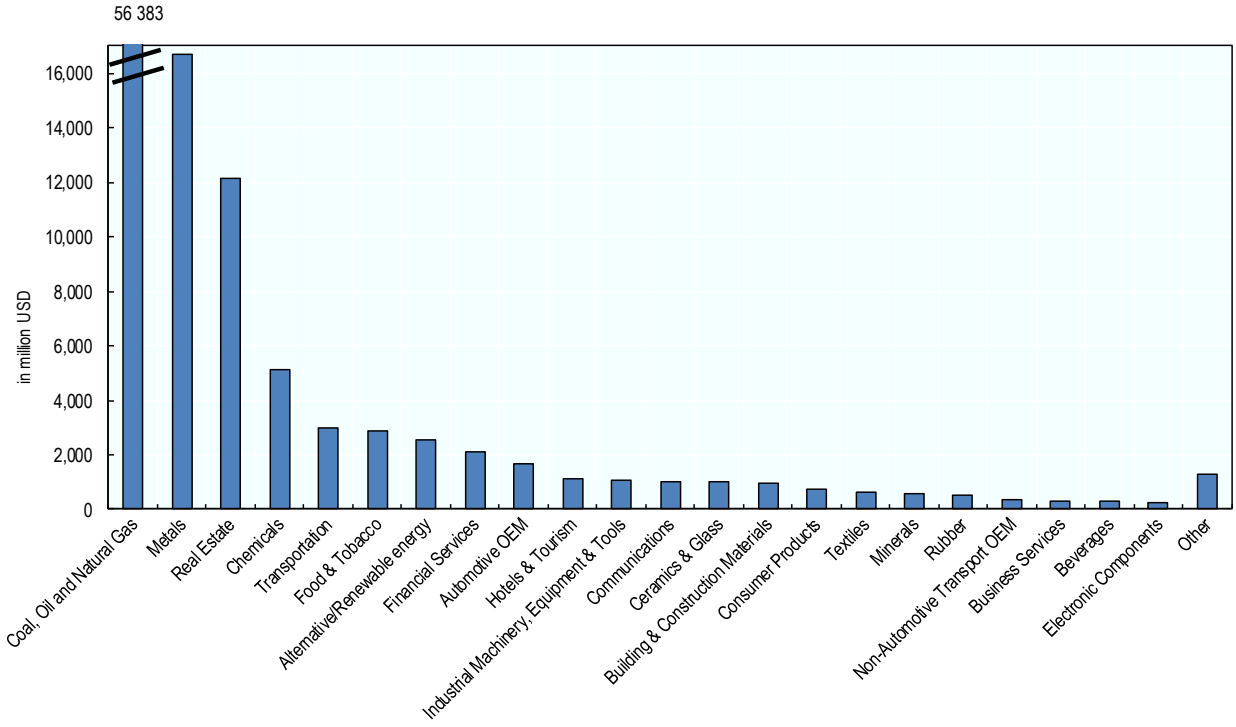


Source: National Bank of Kazakhstan (2018[6]), *Валовый приток иностранных прямых инвестиций в Республику Казахстан от иностранных прямых инвесторов по странам [Gross inflow of foreign direct investment to the Republic of Kazakhstan from foreign direct investors by country]*, National Bank of Kazakhstan, 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 ElectronicsBusiness 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.

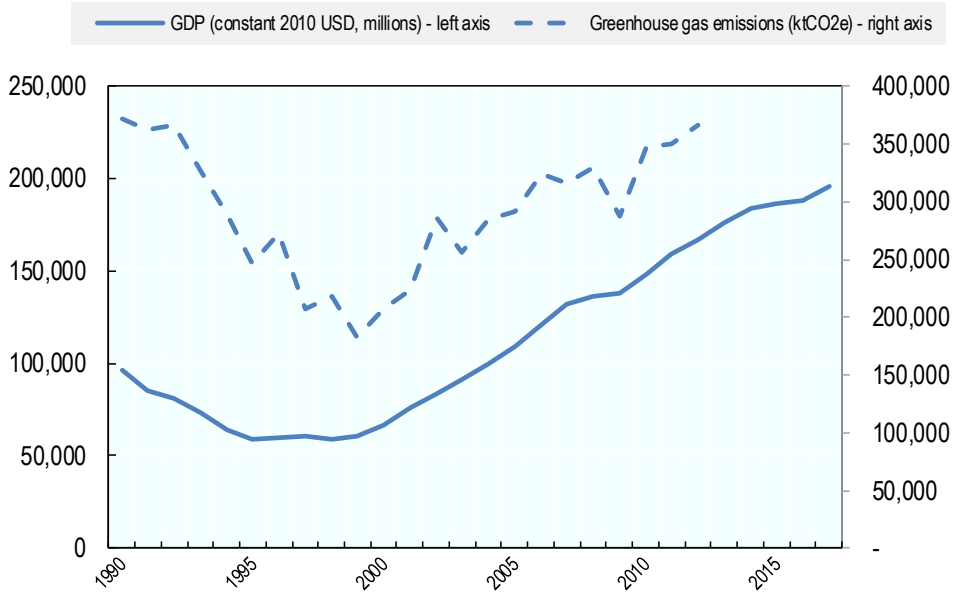
Unlike several other Central Asian countries, Kazakhstan's debt levels to external creditors are not considered risky and it maintains an investment-grade credit rating. Kazakhstan is a key participant in China's Belt and Road Initiative (BRI), but unlike many other participants, Kazakhstan has financed 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 kgCO_2e per USD in 1990 to 2.2 kgCO_2e per USD in 2012 (World Bank, 2019[1]). Over the same period, the country's per capita greenhouse gas emissions decreased from 22.8 tCO_2e in 1990 to 21.8 tCO_2e 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



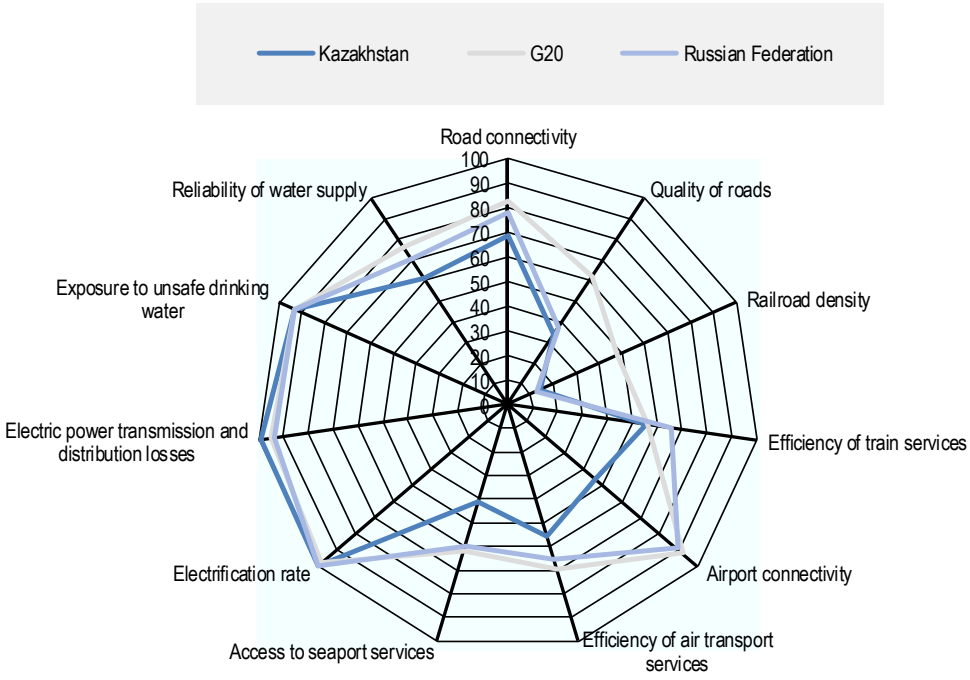
Source: World Bank (2019[1]), *World Development Indicators (database)*, World Bank, https://datacatalog.worldbank.org/dataset/world-development-indicators

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

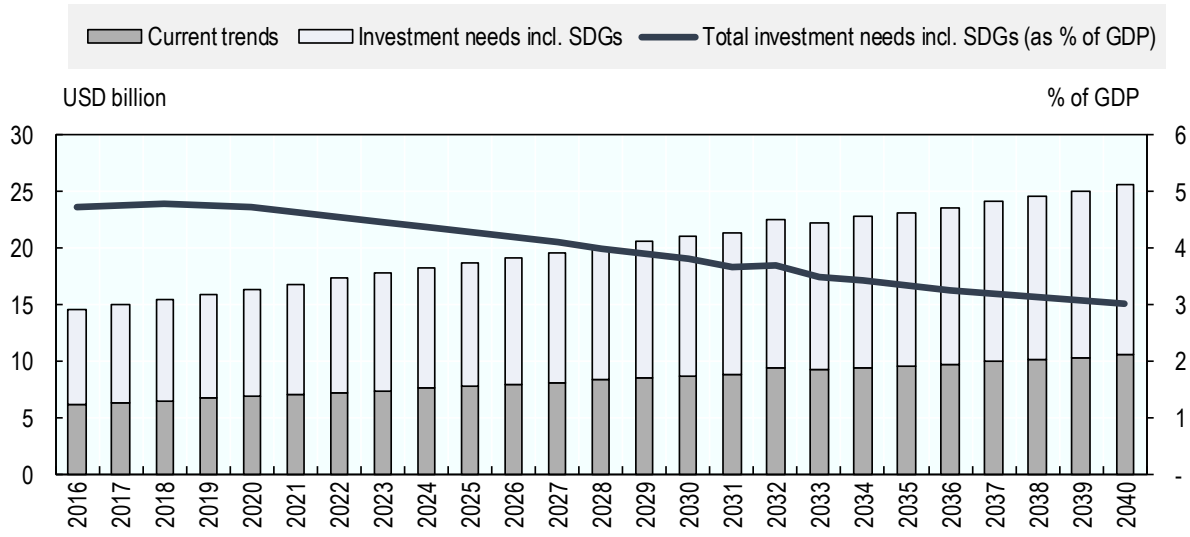
On a scale from 0 (worst) to 100 (best)



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]).

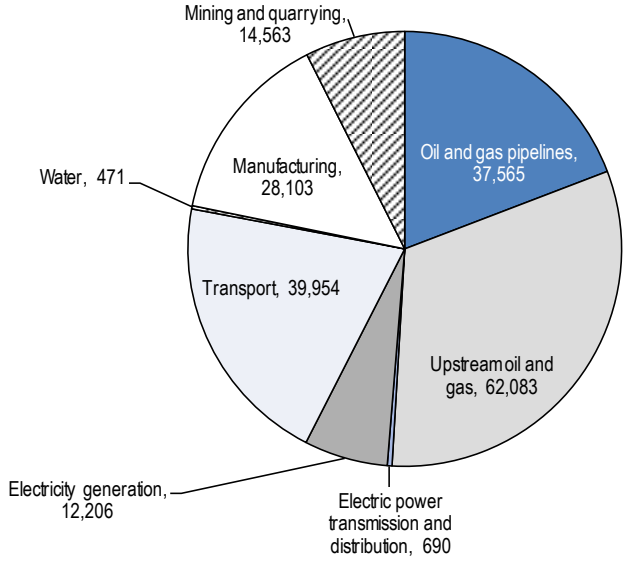
Figure 4.6. Infrastructure investment needs in Kazakhstan, 2016-2040



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

Planned and under construction in USD million



Note: *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 plans, 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

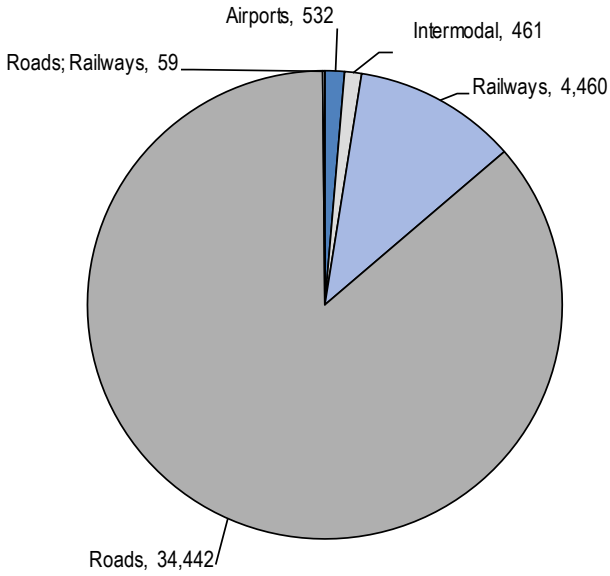
Kazakhstan's annual freight traffic exceeds 200 billion tonne-km, which accounts for more than 80% of regional[1] freight. Kazakhstan's strategic geographic position partially explains this concentration of freight traffic, since most goods bound for Central Asia from Europe and Asia need to pass through 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 Kandyagash – 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.

Figure 4.8. Transport projects in Kazakhstan by sub-sector

Planned and under construction in USD millions



Note: 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

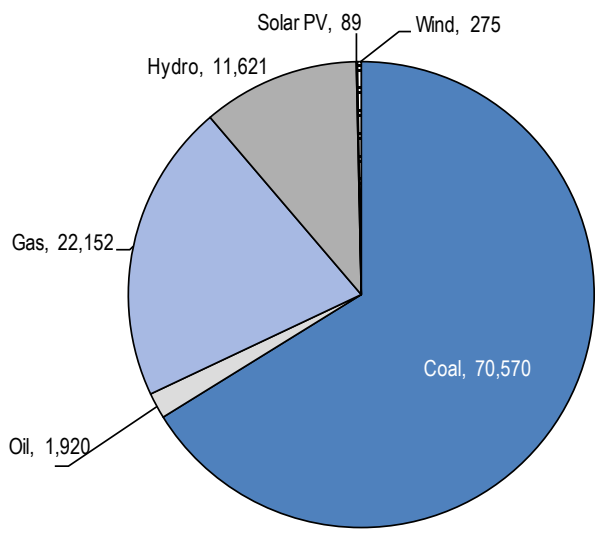
Note: Refer to the Preamble for the present report's definition of 'hotspot' and other information on how the projects above were selected and prioritised. ADB = Asian Development Bank; CDB = China Development Bank; IBRD = International Bank for Reconstruction and Development.

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

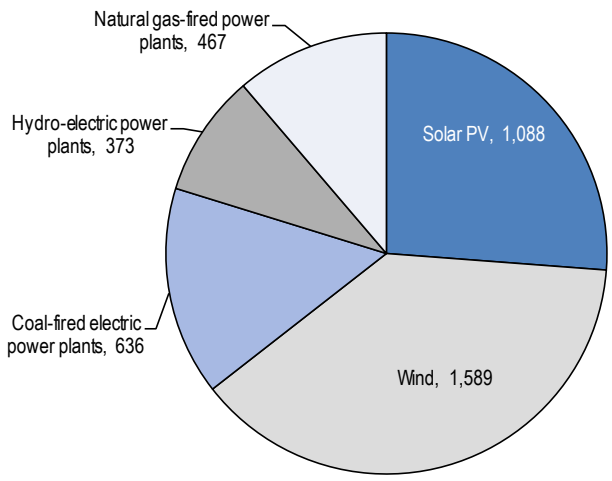
In terms of investment projects in electricity generation under construction and planned, Figure 4.10 shows that 38% of the investments by capacity are in wind power plants (or 1 589 MW), followed by solar PV with 26% (or 1 088 MW) and coal-fired plants with 15% (636 MW). Natural gas-fired electric power 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 and economic diversification goals outlined in its key strategic documents like *Kazakhstan-2050* and the *Concept for a Transition towards a Green Economy*.

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

In Megawatts (MW)



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-Kazakshtan 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)	Oil and gas pipeline	The project is the largest gas transmission system in Central Asia running from Turkmenistan to China through Uzbekistan and Kazakhstan. 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.	7 500	CNPC; Türkmengaz; Uzbekneftegas; KazMunayGas	Greenfield
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,	Greenfield

				Natl Co Kazmunaygaz JSC	
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 project was announced in 2008 and is expected to be completed in 2023.	1 500	KazTransOil	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; 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).

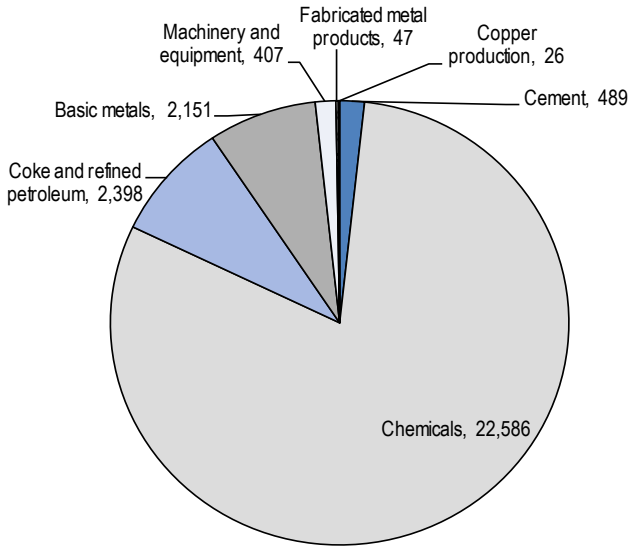
Most of the manufacturing projects are in petrochemical production or mining (see Table 4.4) and target China and the Russian Federation as export markets. For example, a significant project under construction is the Tymlai Mining, Chemical and Metallurgical Complex, a USD 5 billion mining and processing 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 limited number of higher value-added manufacturing among Kazakhstan's planned projects, current investment plans do not appear to be in line with national government's long-term developmental aspirations for a competitive economy, which aims at moving up the value chain and away from a reliance on exported raw materials. 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

Planned and under construction in USD million



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

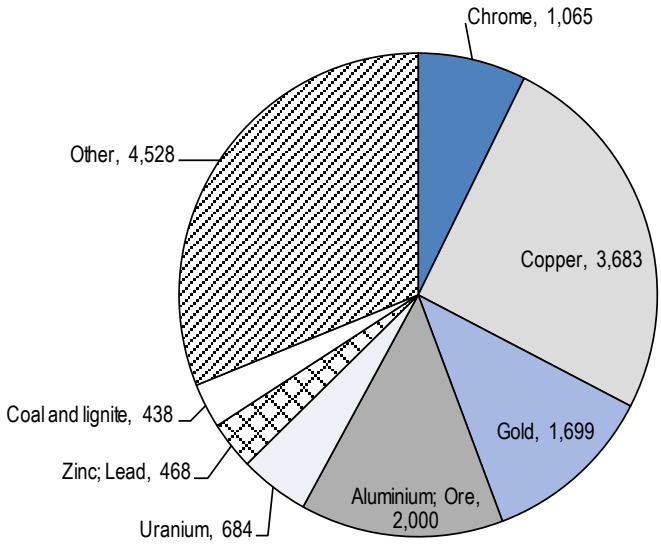
Name	Sub-sector	Description	Project value (USD million)	Funding source	Type of investment
Construction of Tymlai Mining, Chemical and Metallurgical Complex	Multiple	The project is of strategic importance to supply raw materials for industries using steel and titanium dioxide.	2 590	N/A	Greenfield
Construction 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

in USD million



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

Water

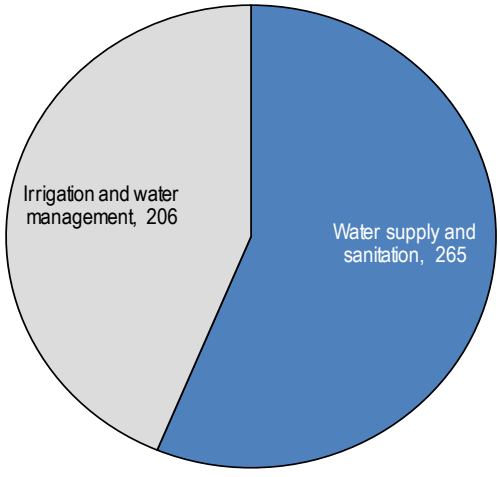
Kazakhstan's population is the least exposed to unsafe drinking water in the region at 8.8%, compared to 13.3% in the Kyrgyz Republic and 12.4% in Tajikistan. Kazakhstan's water supply is slightly more reliable than Tajikistan's (rated 61 out of 100 compared to 60.4) and considerably more reliable than 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

Planned and under construction in USD million



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 CO_2 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. The Ministry of Ecology, Geology and Natural Resources, formed in 2019, has already begun developing a national strategy on low-carbon development.

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 partly responsible for the mining sector, a portfolio it shares with the Ministry of Industry and Infrastructure Development, which remains in charge of licencing (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	• 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	• 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	• Achieve commitments under the Paris Agreement • Consideration of green financing and investment, as well as promoting investment in green technology • Decarbonisation of the economy • 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	• 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	• 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	• Increase environmental requirements for the metallurgic industry
Concept for Development of the	Adopted in 2014	2014-2030	Energy, industry	• Increase energy security • Modernisation of existing infrastructure and building new energy generation capacities

Fuel and Energy Sector until 2030				• 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	• 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	• 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

Notes

[1] Excluding Turkmenistan.

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Chapter 5. Investment in sustainable infrastructure in the Kyrgyz Republic

This chapter describes sustainable infrastructure planning in the Kyrgyz Republic and presents current trends in investment in large-scale infrastructure projects. It compares the Kyrgyz Republic's infrastructure plans in the energy, transport, industry and water sectors against its international commitments under the Paris Agreement on climate change and the Sustainable Development Goals (SDGs). The chapter also explores the Kyrgyz Republic's strategic documents for long-term economic development, sectoral development and the environment, including those related to climate change mitigation and adaptation. It identifies misalignments between stated goals and observed investment flows and provides recommendations to improve strategic planning for sustainable infrastructure.

Overview

The Kyrgyz Republic is a lower-middle income country, the second poorest country in Central Asia after Tajikistan and the least urbanised country of the region. Remittances account for 33.2% of the country's GDP, and the economy is extremely vulnerable to commodity price fluctuation, as gold and other extractives represent 63.5% of total exports, and absorb 80% of FDI. The economy is also particularly vulnerable to climate change: as the temperature rises, the Kyrgyz Republic's glaciers are expected to melt unsustainably, which has important implications for the Kyrgyz Republic's agriculture and energy sectors. Agriculture employs 31.7% of the country's workforce and depends on water from seasonal glacier run-off, and hydroelectric power plants generate 87% of the Kyrgyz Republic's electricity.

The Kyrgyz Republic is also extremely dependant on the People's Republic of China: China provides more than 45% of the country's imports (mainly textiles and refined petroleum), and China's Export-Import Bank holds 40% of the country's total external debt. Almost half of FDI come from China, and close to 80% of FDI go to gold extraction and other metal industries. The Kyrgyz Republic is at moderate risk of distress regarding its debt levels, but extremely vulnerable to exchange rate shocks.

While the Kyrgyz Republic positions itself as a potential transit hub for goods and visitors between Chinese and Western markets, major infrastructure improvements would be necessary. The poor quality of Kyrgyz infrastructure and the country's mountainous geography impede trade flows and access to international markets. The Kyrgyz Republic's rail network is underdeveloped, and consequently road transport accounts for 95% of passenger and freight traffic. Regional initiatives are a great opportunity to unlock the country: The Kyrgyz Republic is in the centre of two CAREC corridors, and the cross-border electric grid initiative CASA-1000, which aims to establish interconnections between the grids of Tajikistan, the Kyrgyz Republic, Afghanistan and Pakistan, allowing the Kyrgyz Republic to export its seasonal surplus of hydro power.

The Kyrgyz Republic's government has actively produced, adopted and published strategic documents covering various timescales (to 2022, to 2040) and topics (sustainable development, export development, green economy) but the lack of a clearly defined hierarchy of documents, budget for the objectives and responsibility for implementation make it difficult to identify the government's key development objectives. For instance, although the Kyrgyz Republic strategic documents express a will to diversify the country's energy mix towards renewable energy, no such projects appear in currently planned projects, which are predominantly hydro projects. The alignment of infrastructure plans with long-term development goals in the Kyrgyz Republic is impeded by weak implementation capacity, including in environment, poor coordination between ministries and unclear legislation on strategic planning.

5.1. State of play: economy, investment and climate change in the Kyrgyz Republic

Economy and trade

Table 5.1. Key indicators on the Kyrgyz Republic's economy

Population (2017)	6 201 500
Urbanisation rate (2017)	36%
Annual population growth (2017)	2.0%
Surface area	199 950 km^2
GDP (USD, current price, 2017)	7 565 million
GDP per capita (USD, current price, 2017)	1 220
Real GDP growth (year-on-year change, 2019)	3.8%
Inflation (average consumer price, y-o-y change, 2017)	3.2%
Exports of goods and services (% of GDP, 2017)	35.4%
Imports of goods and services (% of GDP, 2017)	66.8%
FDI, net inflows (% of GDP, 2017)	-1.4%
General government net lending/borrowing (% of GDP, 2019)	-3.3%
Unemployment (% of total labour force, 2018)	7.2%
Remittances (% of GDP, 2018)	33.2%
Transparency, accountability and corruption in the public sector rating (1= most corrupt, 6 = least corrupt, 2017)	3

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

The Kyrgyz Republic is a lower-middle income country and the second poorest country in Central Asia after Tajikistan. The population of the Kyrgyz Republic reached 6.2 million in 2017, and it has grown by about 2% annually since 2013 (see Table 5.1). This growth rate is the second highest in Central Asia after Tajikistan. The population is young, with over 30% of the population under the age of 15, compared to about 27% in Kazakhstan and Uzbekistan, and 17% in the Russian Federation. At 36%, the Kyrgyz population is the second least urbanised in the region after Tajikistan, but its urban population growth is relatively high at 2.5% (World Bank, 2019[1]).

The country's per capita income almost halved in the lead-up to and the aftermath of the breakup of the Soviet Union in 1991, and per capita GDP in the independent Kyrgyz Republic did not surpass its Soviet-era level until 2007, much later than the Russian Federation and other former Soviet states (World Bank, 2019[1]). Since independence, growth has been irregular, marked by occasional contractions due to political upheaval (i.e. the 2005 and 2010 revolutions) and isolated years or short periods of rapid growth. The sectors that account for the largest shares of GDP are wholesale and retail trade (a category that also includes automobile repair) with 17.8%; agriculture, forestry and fishing with 12.5%, manufacturing with 15% and construction with 8.6% (National Statistics Committee of the Kyrgyz Republic, n.d.[3]).

Trade

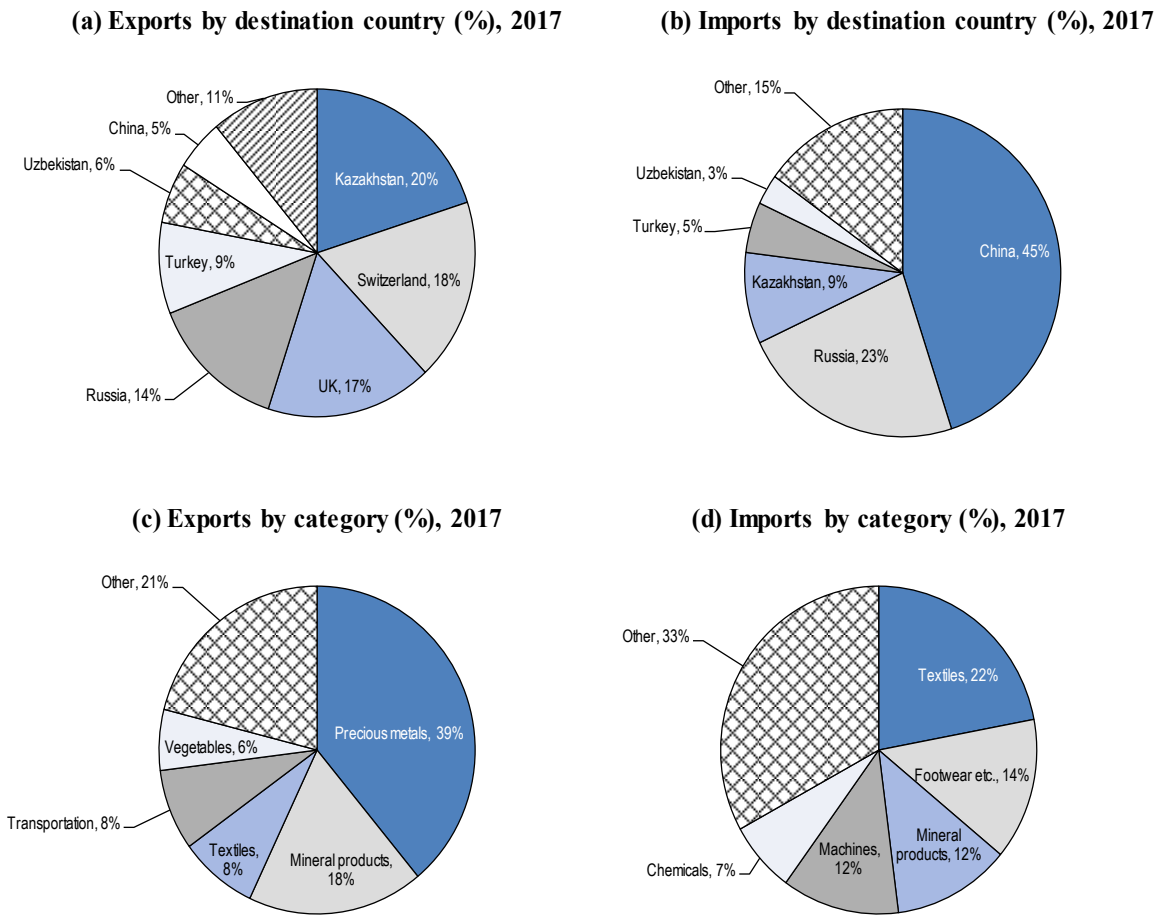
In 2014, the Kyrgyz Republic joined the Russian-led Eurasian Economic Union, which consists of Armenia, Belarus, Kazakhstan, the Kyrgyz Republic and the Russian Federation. As part of its integration into the Union, the Kyrgyz Republic reached an agreement with the Russian Federation to establish the Russian-Kyrgyz Development Fund, which approved USD 261.5 million in credit in 2017 (National Council for Sustainable Development of the Kyrgyz Republic, n.d.[4]). Eurasian Economic Union member countries Kazakhstan and the Russian Federation account for 20% and 14% of the Kyrgyz Republic's exports, but non-Union countries are also very important, especially Switzerland (18%), the United Kingdom (17%) and Turkey (8.4%) (see Figure 5.1 (a)). On the import side, flows from Union members – the Russian Federation (23%), Kazakhstan (8.9%) and Belarus (2.1%) – are dwarfed by imports from China (45%) (see Figure 5.1 (b)).

The Kyrgyz Republic is heavily indebted to China. Approximately 40% of the country's total external debt is to China's Exim Bank, and loans from China for large-scale infrastructure projects as part of the Belt and Road Initiative are expected to worsen the Kyrgyz Republic's debt situation (Hurley, Morris and Portelance, 2018[5]). In the Strategy for the Management of State Debt for 2016-2018, adopted in 2016, the government aims to diversify its creditors and limit its debt to any one particular creditor to 50% of the total external state debt (Ministry of Justice of the Kyrgyz Republic, 2016[6]).

The Kyrgyz Republic is a net importer with a negative trade balance of USD 4.07 billion in 2017. Gold is by far the country's most important export; it alone accounts for 37% of total exports. Extractives – including gold – make up 63.5% the lion's share of exports, and agriculture and foodstuffs (11.7%), manufactured goods (11.6%) and textiles and garments (11.6%) are the country's other main export industries (see Figure 5.1 (c)). The Kyrgyz Republic's main imports are rubber footwear (12%) and refined petroleum (9.9%). 36% of imports are categorised as textiles and footwear, and smaller shares come from extractives (including refined petroleum, 20.4%), manufactured goods (15.7%), agriculture and foodstuffs (12.8%) and chemicals and plastics (10.7%) (see Figure 5.1(d)). Trade activity decreased significantly between 2013 and 2017: imports fell from USD 6.0 billion to USD 4.5 billion, while exports fell from USD 2.0 billion to USD 1.8 billion (Ministry of Justice of the Kyrgyz Republic, 2018[7]).

The Kyrgyz economy is vulnerable to both external and internal shocks. The National Development Programme "Unity, Trust, Creation" states that the Kumtor gold mine accounted for 9.7% of the country's GDP in 2017 and a staggering 43.8% of total industrial production, which ties the country's economic to commodity price fluctuations. The Kyrgyz Republic also depends heavily on remittances sent from workers that have moved for work primarily to the richer Eurasian Economic Union member countries of the Russian Federation and neighbouring Kazakhstan. Personal remittances accounted for 33.2% of the country's GDP in 2018, making it the most reliant country in the former Soviet Union and the second most reliant country in the world after Tonga (World Bank, 2019[1]).

Figure 5.1. Trade of the Kyrgyz Republic



Source: Observatory of Economic Complexity (2017[8]), *Kyrgyzstan: Exports, Imports and Trade Partners*, Observatory of Economic Complexity, https://atlas.media.mit.edu/en/profile/country/kgz/

Investment climate

The Kyrgyz Republic has a relatively open economy, just slightly more closed than the OECD average, ranking between Switzerland and Norway on the FDI Restrictiveness Index (OECD, 2019[9]). It has a competitive corporate tax rate of 10%, low labour costs and relatively cheap electricity as a result of its abundant hydroelectric resources. As a member of the Eurasian Economic Union, the Kyrgyz Republic has preferential trade access to markets in Kazakhstan and the Russian Federation, and it borders China. Major flows of FDI to the Kyrgyz Republic began in the 2000s primarily benefitting the country's gold industry, and FDI has since concentrated on mining industries (UNCTAD, 2016[10]).

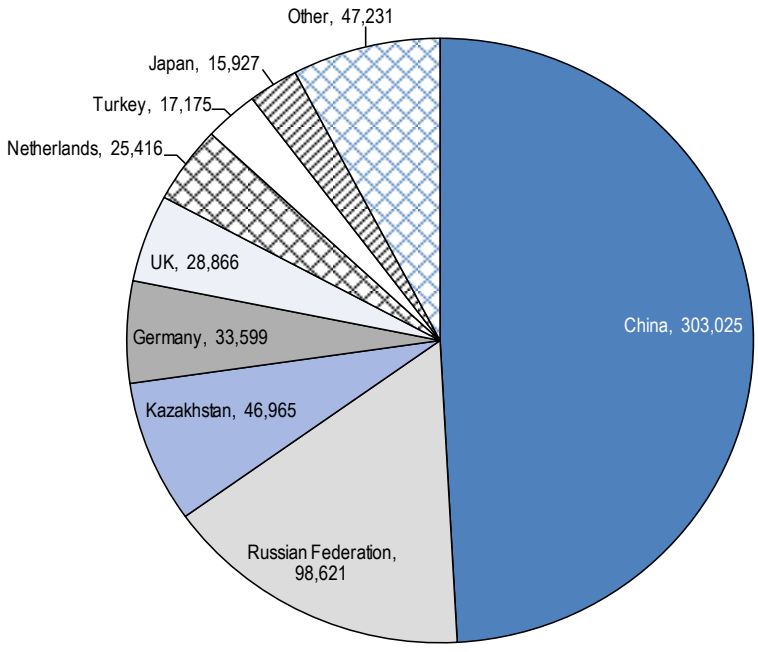
Overall, the formal regulatory environment is relatively strong as a result of legislative reforms based on global best practices on areas such as tax administration, permits, technical regulations and inspections. However, the government's limited capacity hinders effective implementation, and the poor quality of the country's physical infrastructure reduces competitiveness (IBRD, 2018[11]). The Kyrgyz Republic ranked 70th in the World Bank's Ease of Doing Business Report, below regional leaders like Georgia (6th),

Azerbaijan (25th) and Kazakhstan (28th), but ahead of neighbouring Tajikistan (126th). The country does relatively well on scores for registering property (8th) and dealing with construction permits (29th), but performs considerably worse on getting electricity (164th) and the procedures for paying taxes (150th) (IBRD, 2019[12]).

Almost half (49%) of FDI in the Kyrgyz Republic comes from China, and the next most important investors are the Russian Federation (16%), Kazakhstan (8%), Germany (5%) and the United Kingdom (5%) (see Figure 5.2). China is also the Kyrgyz Republic's largest creditor, holding 44.8% of the Kyrgyz Republic's large external public debt of USD 3 838.75 million (Ministry of Finance of the Kyrgyz Republic, 2019[13]).

Figure 5.2. FDI in the Kyrgyz Republic by source country, 2017

USD thousands

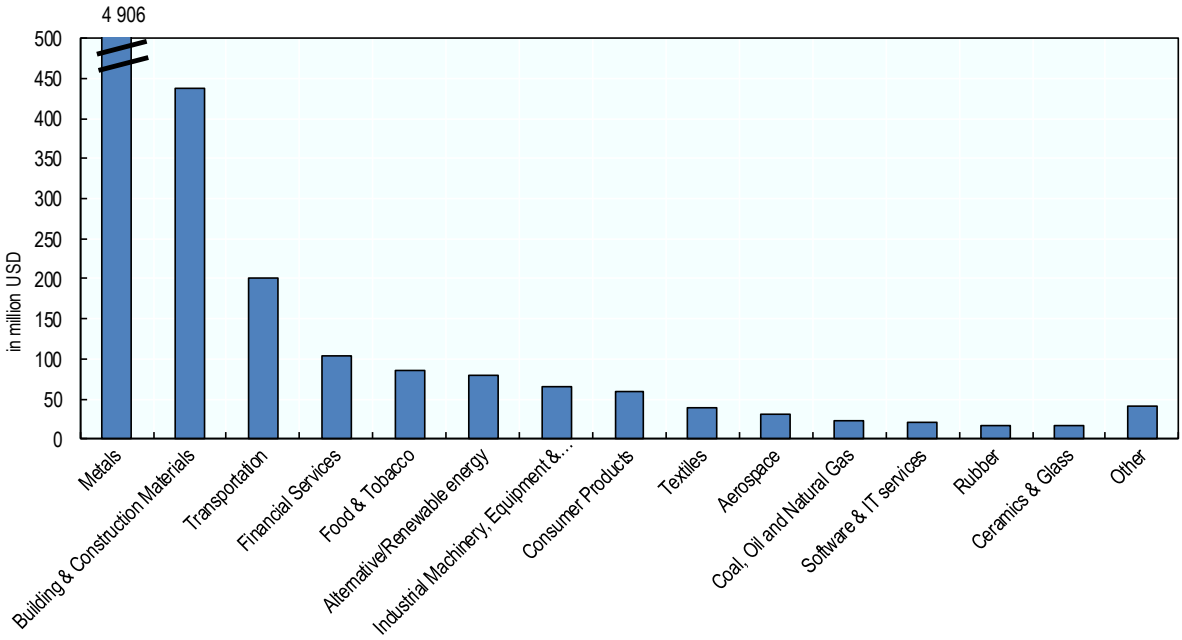


Source: National Statistics Committee of the Kyrgyz Republic (2017[14]), *Иностранные инвестиции в 2017г. [Foreign investments in 2017]*, National Statistics Committee of the Kyrgyz Republic, http://www.stat.kg/ru/statistics/investicii/

Foreign investors in the Kyrgyz Republic have mostly been interested in the country's wealth of mineral resources. The metals industry received 79.5% of all FDI in the Kyrgyz Republic, more than ten times more than the next largest recipient industry, building and construction materials (7.1%) (see Figure 5.3). Infrastructure-related industries, such as transportation (3.3%) and alternative/renewable energy (1.3%), received more modest sums of FDI, while the fossil fuels industries received only 0.4% of FDI.

Figure 5.3. Greenfield FDI in the Kyrgyz Republic by economic activity, 2003-2017

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



Note: Other includes Automotive OEM; Communications; Business Services; Pharmaceuticals; Business Machines & Equipment
Source: OECD based on fDi Markets (2019[15]), *fDi Markets: the in-depth crossborder investment monitor (database)*, fDi Markets, https://www.fdimarkets.com/

The Kyrgyz Republic's debt situation is cause for concern. Public and publicly guaranteed debt in 2017 was equal to nearly 65% of GDP, of which external debt accounted for almost 90%. The country's largest creditor is China's Export-Import Bank, which holds about 40% of Kyrgyz external debt (Hurley, Morris and Portelance, 2018[5]). The International Monetary Fund (IMF) considers the Kyrgyz Republic to be at moderate risk of debt distress, but it stresses the country's fiscal sustainability issues and vulnerability of the Kyrgyz Republic to exchange rate shocks (IMF, 2017[16]).

Climate change

The Kyrgyz Republic is a relatively small economy with a low rate of emissions: It was responsible for only 0.026% of total global emissions in 2012 (World Bank, 2019[1]). The greenhouse gas emissions of the Kyrgyz Republic plummeted after the fall of the Soviet Union and are still at levels 58.6% lower than prior to independence (see Figure 5.4). While the emissions in many former Soviet Union countries have followed a similar trajectory, the Kyrgyz Republic's dramatic drop and limited recovery in emissions levels are unique in the region. Kazakhstan, for example, emitted only 1.6% less in 2012 than it did as part of the Soviet Union, while the Russian Federation and Tajikistan's emissions were 22% and 29.1% lower (World Bank, 2019[1]).

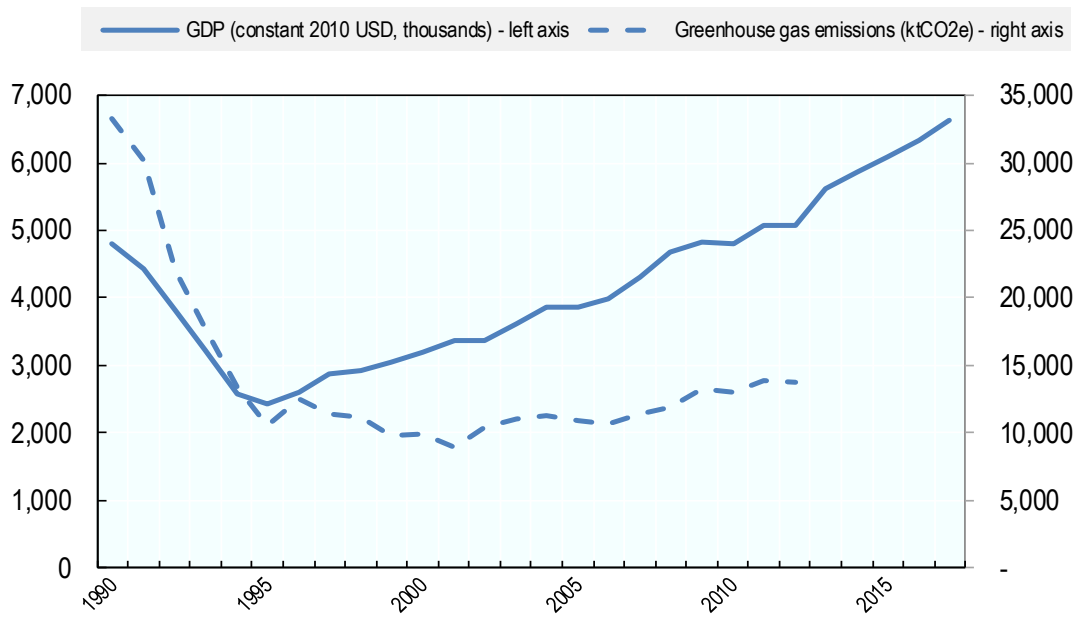
The Kyrgyz economy also experienced a dramatic contraction in the early 1990s, dropping by 49.3% between 1990 and 1995, but then began gradually recovering. By 2009, the Kyrgyz Republic's GDP surpassed its 1990 peak, and by 2017, the economy was 37.9%

larger than in 1990, while emissions remained low. As a result, the greenhouse gas emissions required per unit of GDP (i.e. emissions intensity) in the Kyrgyz Republic fell by more than half from 6.8 kgCO_2e per USD in 1990 to 2.7 kgCO_2e per USD (World Bank, 2019[1]).

Over the same period that the Kyrgyz Republic's emissions declined, the population has also grew steadily. These opposing trends led to the country's per capita greenhouse gas emissions falling from 7.58 tCO_2e in 1990 to 2.46 tCO_2e by 2012 (World Bank, 2019[1]).

The sources of Kyrgyz greenhouse gas emissions have also shifted considerably since independence. While energy use (including for transport) was responsible for 73.3% of emissions in 1990, its share declined to 53.5% by 2010. Meanwhile, agriculture's share of emissions increased from 19.8% to 33.5%. The country's third-largest share of emissions comes from waste (4.2% in 1990, 7.9% in 2010), followed by industrial processes (2.5% in 1990, 3.2% in 2010) and land use, land-use change and forestry (0.1% in 1990, 1.9% in 2010) (UNEP, GEF and Government of Kyrgyz Republic, 2016[17]).

Figure 5.4. GHG emissions and GDP of the Kyrgyz Republic, 1990-2017



Source: World Bank (2019[1]), *World Development Indicators (database)*, World Bank, https://data.worldbank.org/indicator/EN.ATM.GHGT.ZG

The Kyrgyz Republic ranked 52nd in GermanWatch's annual Climate Risk Index, which measures countries' level of risk to climate change-related weather events. According to the index, the Kyrgyz Republic is the most at-risk country in the region (Eckstein, Hutfils and Winges, 2018[18]). The number of natural disasters has already increased considerably. In the years between 2006 and 2011 more disasters occurred than in 1990, and in all but two of those years the incidence was over twice as high (State Agency of Environmental Protection and Forestry under the Government of the Kyrgyz Republic, 2013[19]). As the temperature rises, the Kyrgyz Republic's glaciers are expected to melt unsustainably. Run-off will peak in 2020 and decline thereafter, which has important implications for the Kyrgyz Republic's agricultural sector. This sector employs 31.7% of the workforce and

depends on water from seasonal glacier run-off, and hydroelectric generation (OECD, 2018[20]).

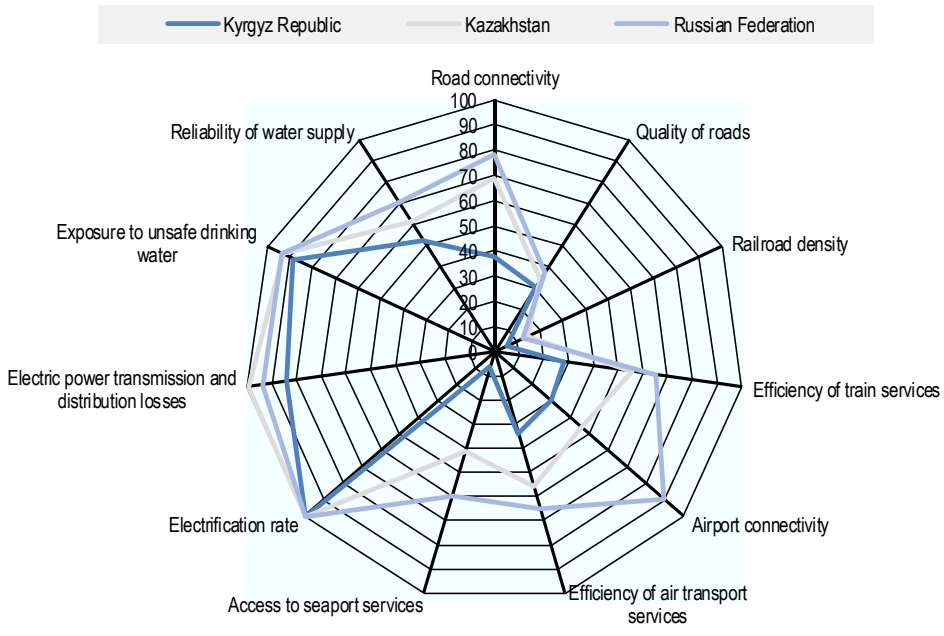
5.2. Kyrgyz Republic's infrastructure needs and current plans

The Kyrgyz Republic's infrastructure needs continue to grow in line with pressure from economic and demographic growth. Its critical infrastructure needs to be enhanced to facilitate cross-border trade and lower transport costs, a key impediment for Kyrgyz exporters. Public investment in infrastructure rose from 4.8% of GDP in 2011 to 7.6% in 2015 (World Bank, 2016[21]). However, much more is needed, particularly for the transport and energy sectors.

In its national strategic documents, the Kyrgyz Republic positions itself as a potential transit hub for goods and visitors between Chinese and Western markets, but major infrastructure improvements would be necessary. Compared to infrastructure elsewhere in the region, the quality of Kyrgyz infrastructure is poor, particularly in the transport sector (see Figure 5.5), which impedes trade flows and its access to international markets.

Figure 5.5. Quality of infrastructure in the Kyrgyz Republic

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



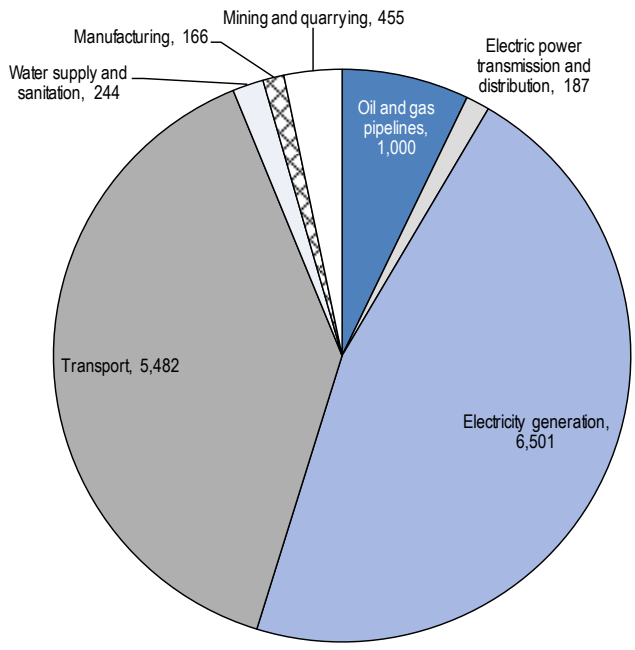
Source: World Economic Forum (2017[22]), *The Global Competitiveness Report 2017-2018*, World Economic Forum, http://www3.weforum.org/docs/GCR2017-2018/05FullReport/TheGlobalCompetitivenessReport2017%E2%80%932018.pdf

The energy and transport sectors dominate the Kyrgyz Republic's large-scale infrastructure plans (see Figure 5.6). Out of the USD 14 billion of investments tracked between 2000 and 2018, energy projects account for 54%, while transport investments make up a further 39%.

Out of the total investments in the energy sector, more than half are concentrated in electricity generation (85% - mostly from hydroelectricity), while oil and gas pipelines account for 13% and the remaining 2% in electric power transmission and distribution. By comparison, investments in industry and water are much smaller at 3% and 1% respectively.

Figure 5.6. Infrastructure projects in Kyrgyz Republic by sector

Planned and under construction in USD million



Note: *Electricity generation* projects include natural gas-fired electric power plants, wind farms, solar plants, hydroelectric power plants, and coal-fired electric power plants. Manufacturing projects include cement plants. Mining and quarrying projects include gold and copper mines.
Source: OECD analysis based on accessed databases as of April 2019.

Transport

The Kyrgyz Republic's mountainous geography and low population density are likely factors in its underdeveloped rail and, to a lesser extent, road networks. The country's population is spread thinly at a density of about 32/km^2 (less than half the density of Tajikistan and Uzbekistan) (World Bank, 2019[1]) over a territory characterised by high altitudes: 94% of the Kyrgyz territory is over 1000m above sea level and 40% is more than 3000m above sea level (FAO, 2012[23]).

Rail service is extremely limited, with two unconnected rail lines (one linking the capital Bishkek to Kazakhstan and Uzbekistan; the other connecting Osh, the country's second-largest city, to Uzbekistan) and only 13 stations in the entire national rail network (Kyrgyz Temir Zholu, n.d.[24]). There are plans to unify the railway network as well as reconstruct and expand aging highways. Road infrastructure represents the overwhelming majority of the Kyrgyz Republic's freight traffic (60% in 2015, and is expected to rise) while rail's share is negligible. As trade volumes increase, transport infrastructure capacity must

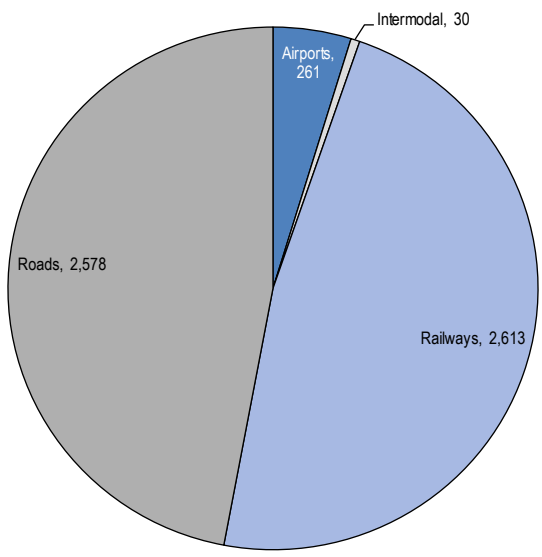
increase rapidly: Kyrgyz road capacity must increase to 251% of current capacity by 2030 and 984% by 2050 to maintain current network performance (ITF, 2019[25]). However, investment in transport and storage has not kept pace with investments in other sectors.

Due in part to the quality of existing transport infrastructure, transport costs are very high in the Kyrgyz Republic. It costs approximately USD 240 for one tonne of goods to reach 20% of global GDP from the Kyrgyz Republic, whereas in Germany the same access can be achieved at a cost of about USD 30 (ITF, 2019[25]).

Within the transport sector, rail projects account for the largest share of planned or under construction infrastructure investments (56%), followed by road (37%) (see Figure 5.7). The largest-scale projects, however, are almost exclusively roads, with the notable exception of the USD 2.5 billion railway project creating a link between Uzbekistan and China via the Kyrgyz Republic (see Table 5.2). The proposed rail link's exact route has yet to be determined, but current proposals fail to connect to the existing Kyrgyz rail system and do not serve domestic population centres. Regardless, the project appears as a strategic priority for the Kyrgyz Republic's development in *Strategy-2040* (see section 5.3 on the Kyrgyz Republic's key strategic documents). Currently, road transport accounts for 95% of cargo and passenger traffic (ADB, 2016[26]).The road projects currently planned or under construction form sections of CAREC regional corridors designed to boost connectivity between Central Asian economies. Although the Kyrgyz Republic's strategic planning documents do not mention CAREC by name, the Development Programme 2018-2022 lists key sections of CAREC corridors among its priority transport projects. *Strategy-2040* identifies the Issyk-Kul ring road project and Osh airport modernisation as well as the improved road connections between Bishkek in the country's north and Osh in the south as priorities for domestic connectivity.

Figure 5.7. Transport projects in the Kyrgyz Republic by sub-sector

Planned and under construction in USD million



Note: Intermodal projects include logistics centres.
Source: OECD analysis based on accessed databases as of April 2019.

Table 5.2. Hotspot projects in the transport sector in the Kyrgyz Republic

(a) Under construction					
Name	Sub-sector	Description	Project value (USD million)	Funding sources	Type of investment
Alternative North–South Road (Zhalal-Abad and Balykchy)	Road	The project is considered as the largest-scale project in the country, connecting Zhalal-Abad and Balykchy cities. It consists of 433 km of road, two elevated bridges and a tunnel, and will be constructed in three phases. The project is expected to have a major effect on connectivity as it will facilitate market access to neighbouring countries, notably for Chinese exports to Uzbekistan, Tajikistan, Kazakhstan and other surrounding countries.	850	N/A	Greenfield
Central Asia Regional Economic Cooperation Corridors 1 and 3 Connector Road Project	Road	The CAREC Corridors 1 and 3 Connector Road will rehabilitate an estimated 253 km of road sections between the southern regions of Batken, Jalal-Abad and Osh with the northern regions of Chui, Issyk-Kul, Naryn and Talas. These two corridors are expected to improve national and regional connectivity notably by further facilitating access to international markets.	263	ADB, EADB, IsDB, Saudi Fund for Development, Kyrgyz government	Brownfield
CAREC Corridor 3 (Bishkek-Osh Road) Improvement Project, Phase 4	Road	The project will reconstruct and rehabilitate an estimated 120 km of road between Bishkek and Osh. The project is expected to enhance national and regional connectivity.	192	ADB, EADB, Kyrgyz government	Brownfield
(b) Planned					
Name	Sub-sector	Description	Project value (USD million)	Funding sources	Type of investment
China-Kyrgyz Republic-Uzbekistan Railway	Rail	The planned project consists of a rail line of about 500 kilometres that starts in China and runs through the Kyrgyz Republic to Ferghana Valley in Uzbekistan. The project is considered to significantly reduce transport costs and the delivery times of Chinese products to European and Persian Gulf markets.	2500	N/A	Greenfield
Expansion of Osh International Airport	Airport	The project will consist of the construction of a new passenger terminal with increased capacity for 450-600 passengers an hour. The project also involves the construction of a new cargo terminal with capacity for 2 000 tons of freight.	119	Project finance	Brownfield
Central Asia Regional Economic Cooperation Corridors 1 and 3 Connector Road Project (Phase 2)-Additional Financing	Road	The project will rehabilitate a crucial connector road that is part of the North-South Alternate Corridor. Such a project is a priority in the National Sustainable Development Strategy. Expected outcomes of this project are improved connectivity as well as enhanced linkages between underprivileged regions and economic hubs.	90.75	IFIs	Brownfield

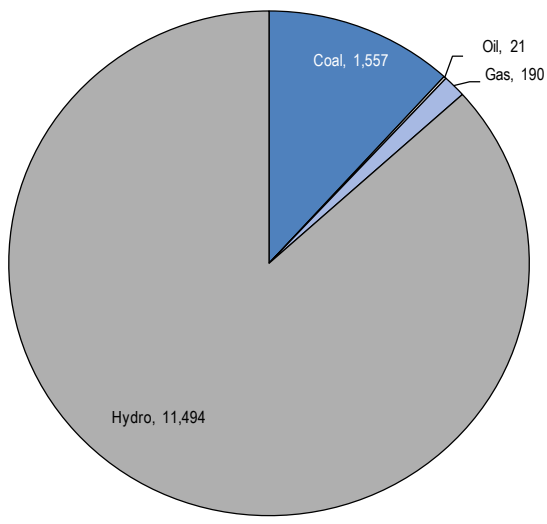
Note: Refer to the Preamble for the present report's definition of 'hotspot' and other information on how the projects above were selected and prioritised. ADB = Asian Development Bank, EADB = Eurasian Development Bank, IsDB = Islamic Development Bank

Source: OECD analysis based on accessed data from ADB (2019[27]), IJGlobal (2019[28]), CSIS (2019[29]), Dealogic (2019[30]) and World Bank (2019[31])as of April 2019.

Energy

In the energy sector, the Kyrgyz Republic has achieved universal electricity access, but the quality of its distribution and distribution networks is relatively poor, leading to losses of 19.7% of electricity (World Economic Forum, 2017[22]). The Kyrgyz Republic relies on exports to meet its energy needs: it is a net importer of coal (11.77 Mtoe in 2017), oil (1.55 Mt in 2016) and natural gas (0.22 Mtoe in 2017). However, it has harnessed its immense hydroelectricity potential allowing it to transition from being a net importer to a net exporter of electricity (0.11 Mtoe in 2016) (IEA, 2018[32]). Hydroelectricity accounts for 87% of Kyrgyz electricity generation, while coal (12%) and natural gas (1%) make up the remainder (see Figure 5.8).

Figure 5.8. Electricity generation by fuel (GWh, 2016)



Source: International Energy Agency (2018[32]), *IEA World Energy Balances 2018*, International Energy Agency, https://webstore.iea.org/world-energy-balances-2018

The large share of hydroelectricity in the Kyrgyz Republic's electricity mix explains in part the country's low levels of greenhouse gas emissions (13795 ktCO2e in 2012, which amounts to 2.46 tCO2e per capita or 0.00026% of total global emissions).

Gas-fired electricity generation and gas pipelines represent respectively 15% of the pipeline of projects in energy (see Table 5.3). Despite the stated objective in the Development Programme 2018-2022 to install at least 100 MW of non-hydroelectric renewable electricity by 2027, no such projects show in the Kyrgyz Republic's infrastructure pipeline. Similarly, evidence of a large-scale push to build natural gas distribution networks in cities, towns and villages throughout the country is absent from the current pipeline, even though "gasification" is a priority in both *Strategy-2040* and the Development Programme 2018-2022.

Table 5.3. Hotspot projects in the energy sector in the Kyrgyz Republic

(a) Under construction					
Name	Sub-sector	Description	Project value (USD million)	Funding sources	Type of investment
Central Asia-South Asia Electricity Transmission and Trade Program (CASA)-1000	Electricity transmission and distribution	The Central Asia-South Asia Electricity Transmission and Trade Program (CASA-1000) is a regional programme that aims to create a sustainable electricity trade between Tajikistan, Kyrgyz Republic, Afghanistan and Pakistan. It involves high voltage AC transmission (HVAC) interconnection between the Kyrgyz Republic and Tajikistan.	997	IFIs	Greenfield
Toktogul Rehabilitation Phase 2 Project	Hydroelectric power plant	Toktogul is the largest power plant in the country currently being updated. The project is expected to improve finances, governance and management of the power sector.	210	ADB, EADB	Brownfield
(b) Planned					
Name	Sub-sector	Description	Project value (USD million)	Funding sources	Type of investment
Kambarata 1 Hydropower plant (1900-MW)	Hydro	The project initially started in 1986 but it was halted when the Soviet Union collapsed. It is expected to support the country to become a power exporter. The project is being financed in large part by a USD 2 billion Russian aid package, which was announced in 2009.	3000	Russia	Brownfield
Gas Pipeline Kyrgyz Republic - China (Segment D (4th) of Central Asia - China pipeline	Oil and gas	The project involves the construction of a 215 km gas pipeline, which is a part of line D of the Central Asia-China gas pipeline network. It will have an estimated annual capacity of 30 bcm. Despite being a significant cross-border infrastructure project, it is not yet clear whether the country will receive or supply gas to the pipeline or only play a transit role.	1000	CNPC, Kyrgyz government	Greenfield
Uch-Kurgan Hydro Plant Modernisation	Hydro	This project will modernise the hydropower plant located in the Naryn River cascade. Expected outcomes include enhanced use of clean hydropower as well as to export to neighbouring Uzbekistan and Kazakhstan.	145	ADB, EADB	Brownfield

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, CNPC = China National Petroleum Corporation, EADB = Eurasian Development Bank.
Source: OECD analysis based on accessed data from ADB (2019[27]), IJGlobal (2019[28]), CSIS (2019[29]), Dealogic (2019[30]) and World Bank (2019[31]) as of April 2019.

Industry and mining

In the industry and mining sectors, most of the planned investments are in gold mining (64%) and cement (31%), followed by copper mining (5%). In fact, gold remains the primary mineral in terms of value mined in the Kyrgyz Republic. The Kyrgyz Republic's *Strategy-2040* and Development Programme both mention diversification of the industrial sector as key priorities, and name textiles and processed milk products among target sectors. No projects in these sectors feature in the current project database, but this may be due in part to the threshold value of USD 10 million and the relatively small scale of projects in these sectors. The Investment Promotion and Protection Agency of the Kyrgyz Republic is currently promoting investments into smaller industry projects such as for example for the construction of a stone processing plant, and production of chemicals,

cosmetics and household detergent (Investment Promotion and Protection Agency of the Kyrgyz Republic, n.d.[33]).

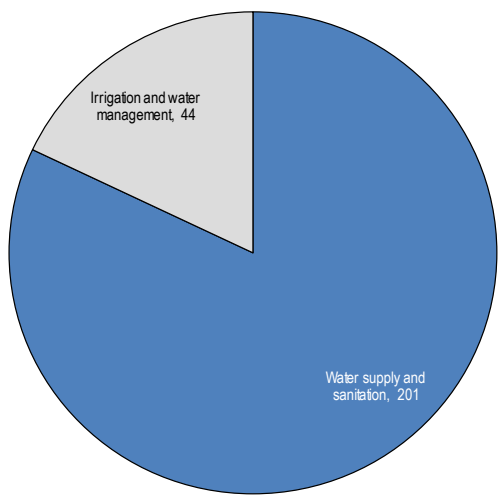
One area that has received increasing investments and has a tendency to grow is the mining and quarrying sector, which currently accounts for over 10% of GDP and 50% of industrial output. According to the World Bank, mining remains both a significant growth driver and a potential environmental risk for the country (IDA, 2018[34]). The World Bank also called for the need to promote more efficient and green processes in the industrial sector.

Water

In the Kyrgyz Republic, improving water supply to rural areas remains a priority in both major development strategies. This is also confirmed in the water projects that are currently under construction and planned, where out of a total of USD 245 million, around 82% focus on improving the water supply and sanitation projects (see Figure 5.9). There are also irrigation projects that aim to improve agricultural productivity for farmers, which accounts for the remaining 18% of investments. The Kyrgyz Republic faces urgent investment needs in the water sector (World Bank, 2016[35]). All of the country's water projects are financed by multilateral development banks, namely the ADB, EIB, EBRD and the World Bank.

Figure 5.9. Water projects in the Kyrgyz Republic by sub-sector

Planned and under construction in USD million



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

5.3. 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

The Kyrgyz Republic's government has actively produced, adopted and published strategic documents covering various timescales (to 2022, to 2040) and topics (sustainable

development, export development, green economy) (see Table 5.4 and Table 5.5). In theory, this wealth of documents should provide a clear vision of the country's future development and signals to investors about the government's priorities. However, the sheer number of documents, their diversity of structure and content and the lack of a clearly defined hierarchy of documents and responsibility for implementation make it difficult to identify the government's key development objectives.

The *National Development Strategy to 2040 (Strategy-2040)*, adopted in 2018, recognises these problems and has proposed key reforms that may improve forthcoming strategic documents. For instance, *Strategy-2040* has called for a new law on strategic planning to replace the abrogated 2015 law "On the state system of strategic planning" and improve the quality of strategic planning documents. If adopted, the new law will standardise the format of strategic planning documents and the procedure by which the government prepares them and associates a budget to their objectives, which was not always done in the past. A standard format and clearly defined budgets and responsibilities would simplify the interpretation of government priorities and monitoring of strategy implementation.

Although the government's decision to reduce the number of strategic documents in favour of fewer higher-quality strategies is a welcome move, the cancellation of several documents associated with the previous administration follows a trend of overhauling strategic plans upon election. There may be such a risk for long-term strategic documents like *Strategy-2040*. Credibility of Kyrgyz long-term strategies will depend on their independence from the electoral cycle and their ability to signal stable and consistent policy direction of future development to policy makers, citizens and investors.

Strategy-2040 proposes reforms that may bolster the credibility of strategic documents. It recommends 'de-monopolising' strategy development through increased public participation, which may help increase public ownership of the process, reduce the perception that a given strategy is the product of the current administration alone and encourage its continued implementation after the next election.

Strategy-2040 also recognises that the quantity of previously adopted documents has led to uneven implementation and inconsistent policy messages. It states that all strategies adopted prior to *Strategy-2040* will undergo review and, if misaligned with *Strategy-2040*, be revised or cancelled. The development of all future strategies must align with the long-term objectives of *Strategy-2040*. By establishing a top-level strategy to which future strategies must conform, the government has made a step in the right direction towards clearly articulating its development agenda.

Both *Strategy-2040* and the *Development Programme of the Kyrgyz Republic for the period 2018-2022: "Unity, Trust, Creation"* lack budgets for their objectives and do not identify the government bodies responsible for individual goals, which may impede their implementation. The *Green Economy Concept*, meanwhile, has no associated timeline and its objectives do not specify delivery dates. As the *Strategy-2040* calls for reforms that would clarify the procedure for defining budgets and responsibility in future documents, consideration could be given to amending the *Green Economy Concept* to this effect.

The Kyrgyz Republic's existing strategies do not take environmental considerations sufficiently into account. The Kyrgyz Republic was the last country in Central Asia to ratify the Paris Agreement in late 2019, has and it has not yet adopted a long-term low-emission development strategy. Long-term emissions reduction and climate-change resilience objectives are not properly integrated into the Kyrgyz Republic's main development strategies, such as *Strategy-2040* and the Development Programme 2018-2022. These

documents do, however, set targets relating to infrastructure development with significant effects on sustainable development and climate agendas. For instance, *Strategy-2040* aims to reduce electricity transmission losses, transition from solid fuel-based heating to natural gas and improve connectivity through repair and construction of roads. The *Green Economy Concept*, adopted in 2018, echoes several of the objectives laid out in *Strategy-2040*, but as a broad, aspirational document with no time frame and few quantitative objectives, its expressed policy directions have not been translated into concrete actions and integrated into the Kyrgyz Republic's other strategic documents.

Institutional set-up and decision making processes

Coordinating bodies exist, including on climate change, but there is limited evidence of its ability to mainstream sustainable development and climate goals in national policies. The National Council on Sustainable Development has existed since 2012 to oversee and coordinate the implementation of the *National Sustainable Development Strategy 2013-2017*. Housed within the Presidential Administration and explicitly charged with cross-ministerial coordination and consultation with non-government actors, the National Council is well placed to fulfil its role of gathering stakeholders. It has included representatives from various parties (including opposition parties), ministries, NGOs (including environmental NGOs) and academic institutions in its previous meetings.

Strategy-2040 seeks to strengthen the Council's role in strategic planning further by charging it with ensuring the alignment of lower-order strategic documents and sectoral plans with the goals of *Strategy-2040*. Currently the council only meets on an ad hoc basis (but no less than twice a year), however given its proposed new responsibilities its meetings may need to occur more regularly and the Council's secretariat within the Presidential Administration may need additional capacity to function effectively.

The government's coordinating body on climate change, the Coordination Commission on Problems of Climate Change, is responsible for providing guidance and coordinating ministries' activities to meet the Kyrgyz Republic's commitments under the UNFCCC. Despite the progress made by the Coordination Commission, there are still insufficiently clear mechanisms to ensure coordination between state bodies (Bekkulova et al., 2018[36]). Such coordination could improve the integration of climate considerations into existing strategic documents and state policies.

Overall, inadequate coordination between government bodies contributes to unclear responsibility on goal delivery, as recognised in the 2018-2022 Development Programme.

The Kyrgyz Republic's approach to large-scale investments is contributing to unsustainable levels of indebtedness. The Kyrgyz Republic has been identified as one of the developing countries most at risk of debt stress due to its large number of foreign loans. Its government gross debt was equal to 62.1% of GDP in 2016 and is forecast to rise (Hurley, Morris and Portelance, 2018[5]).

List of relevant strategic documents

Table 5.4. Main strategic documents in force

	Status	Time Horizon	Sectoral Coverage	Main objectives
National Development Strategy to 2040	Adopted in 2018	2018-2040	Governance, planning, transport, energy, water, industry	• Standardise format and preparation procedure of strategic documents; increase public participation in strategy elaboration • Reduce electricity losses by 11% by 2023; switch to gas-fired heating in rural regions • Repair and construct north-south roads; improve airports • Ensure water supply and sanitation in rural areas • Construct factories, including an electric vehicle factory in Bishkek
Development Programme of the Kyrgyz Republic for the period 2018-2022: "Unity, Trust, Creation"	Adopted in 2018	2018-2022	Transport, energy, light industry, water, mining	• 60% of roads with hard covering and 5 000 km of new roads by 2022 • Reliable clean water supply to 80% of the population by 2022
Green Economy Concept: "Kyrgyzstan – Country of Green Economy"	Adopted in 2018	No defined timeframe	Transport, energy, industry, water	• Improve fuel quality, increase public transportation use • Reduce electricity and heat subsidies, switch to gas-fired heating, develop hydroelectricity and other renewables • Improve resource and energy efficiency of industries (mining, fossil fuel refining) • Attract more FDI for sustainable infrastructure to meet SDGs
Regional Policy Concept for the period 2018-2022	Adopted in 2017	2018-2022	Transport, energy, industry, water	• Facilitate economic development and integration of regions within the country through improved infrastructure services
Main Policy Directions of Rail Transport Development	Adopted in 2014	2014-2020	Transport	• Strengthen rail links between the northern and southern parts of the country, improve transit potential, integrate rail network with neighbouring countries' lines • Modernise existing infrastructure
Main Policy Directions of Road Sector Development	Adopted in 2016	2016-2025	Transport	• Rehabilitate and maintain of transport corridors • Develop public-private partnerships (e.g. Almaty-Issyk Kul road)
Programme for the Development of Civil Aviation	Adopted in 2016	2016-2020	Transport	• Improve key airports (e.g. Manas Airport in Bishkek) and build new ones (e.g. new Osh airport)
Fuel and Energy Complex Development Strategy until 2025	Adopted in 2008	2008-2025	Energy	• Increase exports of hydroelectricity to 4.2-6.4 TWh by 2025, establish cooperation mechanisms with neighbouring Central Asian countries • Cut emissions by half of 1990 levels or to 12 000 ktCO_2e by 2025 • Construct several hydroelectric power plants and an additional gas pipeline from Kazakhstan
Programme for Export Development 2019-2022	Adopted in 2018	2019-2022	Industry	• Expand SMEs' share of GDP to 43-45% and double the value of SME-produced exports to USD 27 million by 2022 • Prioritise the development of the textile and dairy industries as well as fruit and vegetable processing
Strategy for the Development of Drinking Water Supply and Sanitation Systems	Adopted in 2016	2016-2026	Water	• Ensure centralised drinking water supply to at least 90% of cities and 700 thousand rural inhabitants by 2026 • Provide waste water services to no less than 70% of rural villages by 2026

in Settlements of the Kyrgyz Republic to 2026				
State Programme for Irrigation Development	Adopted in 2017	2017-2026	Water	• Construct and rehabilitate 21 canals and 5 reservoirs

Table 5.5. Other relevant documents

	Status	Time Horizon	Sectoral Coverage
Priority Directions for Adaptation to Climate Change in the Kyrgyz Republic till 2017	Adopted in 2013	2013-2017	Multi-sector
Concept of Ecological Security	Adopted in 2007	2007-2020	Multi-sector
Medium-term Strategy for Electricity Development for 2012-2017	Adopted in 2012, cancelled in 2018	2012-2017	Energy
Strategy of Road Sector Development to 2025	Drafted in 2015, not adopted	2015-2025	Transport
Programme for the Transition of the Kyrgyz Republic to Sustainable Development	Adopted in 2013	2013-2017	Multi-sector
Programme "Forty Steps towards a New Era"	Adopted in 2017, repealed in 2018	2018-2023	Multi-sector
National Sustainable Development Strategy for the period 2013-2017	Adopted in 2013	2013-2017	Multi-sector
National Energy Program of the Kyrgyz Republic for the period 2008-2010	Adopted in 2008	2008-2010	Energy
Program on the proper management of chemicals in the Kyrgyz Republic for the period 2015-2017	Adopted in 2015	2015-2017	Multi-sector
Priorities for the conservation of wetlands till 2023	Adopted in 2013	2013-2023	Multi-sector
Concept of Small Hydropower Industry Development in the Kyrgyz Republic till 2017	Adopted in 2015	2015-2017	Energy

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Chapter 6. Mongolia's sustainable infrastructure investments

This chapter describes sustainable infrastructure planning in Mongolia and presents current trends in investment in large-scale infrastructure projects. It compares Mongolia's infrastructure plans in the energy, transport, industry and water sectors against its international commitments under the Paris Agreement on climate change and the Sustainable Development Goals (SDGs). The chapter also explores Mongolia's strategic documents for long-term economic development, sectoral development and the environment, including those related to climate change mitigation and adaptation. It identifies misalignments between stated goals and observed investment flows and provides recommendations to improve strategic planning for sustainable infrastructure.

Overview

Mongolia is a lower-middle income country located between the Russian Federation and the People's Republic of China, and the least densely populated country in the world, with more than 50% of its population living in the capital Ulaanbaatar. Its economy is highly dependent on the mining sector, which represents almost 24% of GDP but employs only 2% of its workforce, while agriculture employs a third but accounts for only 13% of GDP. China is Mongolia's primary trade partner by far (76% of exports and 32% of imports), followed by the Russian Federation.

Mongolia has undertaken reforms in its investment regulatory framework to attract foreign direct investments, increase transparency and put domestic and international investors on more equal footing. However, the country is still considered to be a risky investment destination, and ranks 74th in the World Bank's Ease of Doing Business index. One of the main issues in Mongolia is its level of public debt that rose from 62.1% of GDP in 2015 to 87.6% of GDP in 2016. China plans to extend approximately USD 30 billion of credit to Mongolia for projects related to the Belt and Road Initiative, but such a loan could exacerbate Mongolia's risk of sovereign default, which is already considered as extremely high. Metal, coal and natural gas absorb more than 80% of current FDI.

Mongolia's transport, water and energy infrastructure suffer from considerable deficiencies due to underinvestment in maintenance. Mongolia is a strategic hub for freight transport between the Russian Federation and China: 90% of freight transport between the two countries relies on Mongolia's national rail service. The three countries signed a programme to develop the China-Mongolia-Russia economic corridor, including four rail and three road corridors through Mongolia. Mongolia also invested massively in its national road network that increased threefold over the past two decades. Most of the current planned transport projects in Mongolia aim at transporting coal and other minerals from various mines to China and its seaports.

Mongolia's energy infrastructure is also insufficient: investments have failed to keep pace with the country's rapid economic growth, with 11.4% of losses along the electric grid, and more than 10% of the population with no access to electricity. Less than 25% of the population has access to direct heating, and the population relies on coal-fired boilers and cook stoves leading to very high air pollution in the capital during winter months. Despite the rising share of renewable energy from 1% to 7% of the electricity mix by 2018, coal remains the main source of electricity (93%). Moreover, coal power plants continue to represent 95% of current planned investments, leading to further carbon lock-in. This focus on coal is not in line with the country's *Sustainable Development Vision 2030* strategy document, which aims to increase the use of renewables for electricity generation by 30% and start using electricity from nuclear power plants by 2030.

Environmental protection and climate change-related policies are central to Mongolia's vision of long-term development, and is reflected in several long-term strategic planning documents with a coherent structure and stated goals. However, the country's stated environmental focus fails to materialise in current investment plans. This is due partly to poor climate and monitoring capacities in government bodies, and a high turnover among ministry staff.

6.1. State of play: economy, investment and climate change in Mongolia

Economy and trade

Table 6.1. Key indicators on Mongolia's economy

Population (2018)	3 170 208
Urbanisation rate (2018)	68%
Annual population growth (2018)	1.8%
Surface area	1 564 120 km^2
GDP (USD, current price, 2018)	13 010 million
GDP per capita (USD, current price, 2018)	4 104
Real GDP growth (year-on-year change, 2019)	6.3%
Inflation (average consumer price, y-o-y change, 2018)	6.8%
Exports of goods and services (% of GDP, 2018)	60.3%
Imports of goods and services (% of GDP, 2018)	63.5%
FDI, net inflows (% of GDP, 2018)	16.7%
General government net lending/borrowing (% of GDP, 2019)	-5.5%
Unemployment (% of total labour force, 2018)	6.3%
Remittances (% of GDP, 2018)	4.4%
Transparency, accountability and corruption in the public sector rating (1= most corrupt, 6 = least corrupt, 2017)	3.5

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

Mongolia is a lower-middle income country located between the Russian Federation and the People's Republic of China. Its population of more than 3 million is distributed over a vast territory of over 1.5 million km^2, which makes Mongolia the least densely populated country in the world (2 people/km^2). Mongolia's population has grown steadily over the past several decades. Its rate of growth was slightly higher between 1960 and 1987 (2.8% annually on average) before falling to 0.8% in 1994 and recovering over the following two decades (2.1% annually on average since 2010). Mongolia's population is overwhelmingly urban, with 68% of Mongolians living in urban centres, and almost half the population living in the capital Ulaanbaatar.

Mongolia, unlike the other countries in the present study, was never formally part of the Soviet Union, although it did have important economic links to it. Therefore, Mongolia's economy contracted following the break-up of the Soviet Union but not as dramatically as the Union's constituent republics. Between 1989 and 1994, Mongolia's GDP contracted by 22.5% (falling from USD 4.0 billion to USD 3.1 billion) and then recovered, surpassing its 1989 levels by 2001. The economy has since grown rapidly and, by 2019, was more than three times larger than in 1989 (USD 12.4 billion).

Services accounted for 40.3% of Mongolia's GDP in 2018, while the mining sector accounted for a further 23.7%. Agriculture, particularly animal husbandry, is also a key

component of the Mongolian economy: Agriculture accounted for 10.9% of GDP in 2018 (Mongolian Statistical Information Service, 2019[3]) and 35% of the country's working population earn their income through animal husbandry (FAO, n.d.[4]).

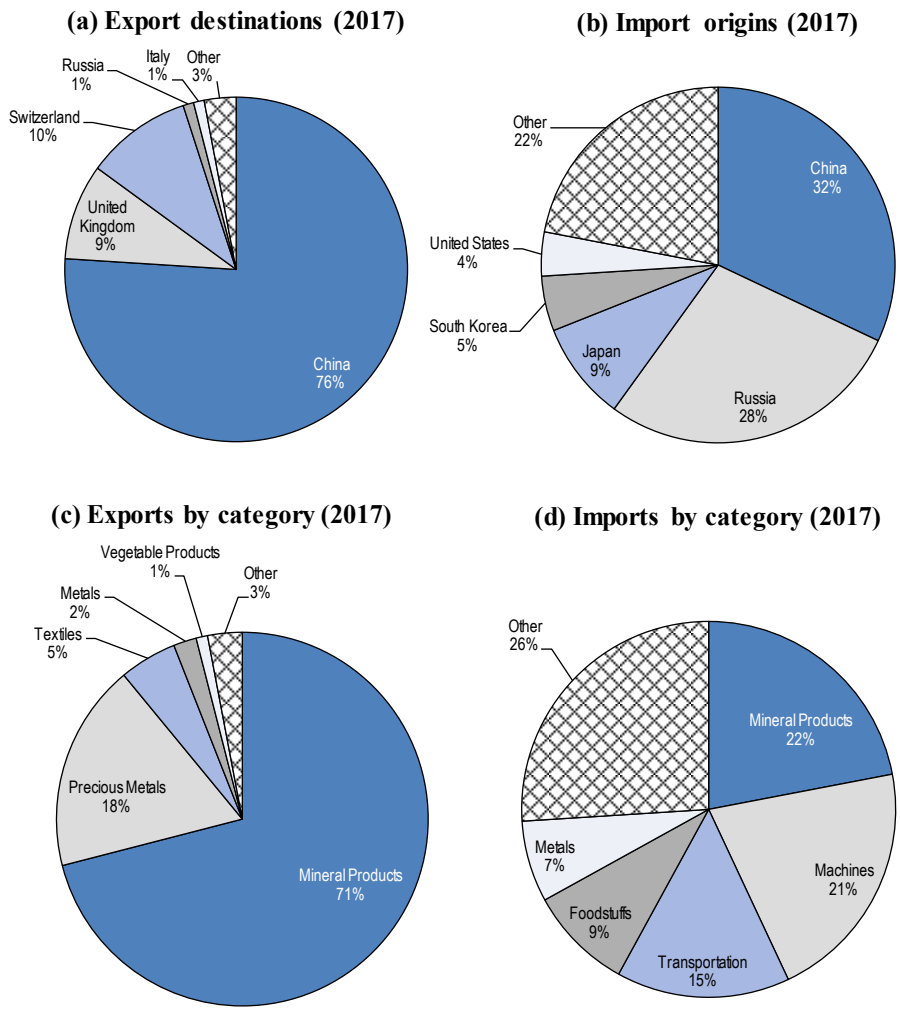
Trade

Mongolia has been a member of the World Trade Organisation since 1997. Mongolia's government has actively pursued free trade agreements with important trading partners. Free trade agreements are under discussion with China (Asia Regional Integration Center, 2010[5]) and Korea (Asia Regional Integration Center, 2008[6]), and an economic partnership agreement with Japan entered into force in 2016 (Ministry of Foreign Affairs of Japan, 2016[7]).

Most of Mongolia's exports fall into two categories: mineral products (particularly coal briquettes and copper ore, which account for 33% and 24% of Mongolia's exports respectively) and metals (especially gold, which make up 18% of exports) (see Figure 6.1(c)). Mongolia also produces a third of the global supply of cashmere from its sizeable population of cashmere goats. The expansion of the cashmere industry and concurrent pressures on soils from overgrazing have contributed to land degradation and accelerated desertification in certain districts of the country (Shmitz, 2016[8]). Mongolia imports a wide variety of products (see Figure 6.1(d)). Unlike many of its hydrocarbon-rich Central Asian neighbours, Mongolia relies on imports of refined petroleum (18% of imports) and electricity (3% of imports) to meet its energy needs. Cars and delivery trucks are also important imports, accounting for 5.9% and 3.9% of imports respectively.

China is by far Mongolia's most important trading partner. It is Mongolia's largest export market, accepting over three quarters of Mongolia's exports, and the origin of a third of Mongolia's imports (see Figure 6.1(a) and (b)). Mongolia's other geographical neighbour, the Russian Federation, supplies 28% of its imports but is an export market of only modest importance (1%). Other important trading partners include Switzerland (a major gold importer) and the European Union (11% of exports, 12% of imports). Mongolia's trade with most of the countries in the present study is limited, but Kazakhstan is a relatively important source of imports to Mongolia (1.6%).

Figure 6.1. Trade of Mongolia



Source: Observatory of Economic Complexity (2017[9]), *Mongolia: Exports, Imports and Trade Partners*, Observatory of Economic Complexity, https://oec.world/en/profile/country/mng/

Investment climate

Due to its location near major markets such as China and the Russian Federation and its vast mineral deposits, Mongolia has potential to develop further as a destination for foreign direct investment (FDI). The government, faced with severe fiscal constraints and the imposition of an IMF (2017[10]) reform package under the Extended Fund Facility (EFF), has turned to FDI to make up for the shortfall in investment capital for important infrastructure projects. It has therefore pursued reforms to its investment regulatory framework to increase transparency and put domestic and international investors on more equal footing (US Embassy in Mongolia, 2018[11]). In 2019, Mongolia ranked 74th on the World Bank's Ease of Doing Business index, just between the Kyrgyz Republic (70th) and Uzbekistan (76th), but considerably lower than regional leaders Georgia (6th), Azerbaijan (25th) and Kazakhstan (28th). While Mongolia ranked relatively well on metrics such as ease of getting credit (22nd) and construction permits (23rd) as well as protecting minority investors (33rd), it was near the bottom of the

rankings for getting electricity (148th) and resolving insolvency (152nd) (IBRD, 2019[12]). Despite improvements in the country's Doing Business rankings, investors still consider Mongolia a high-risk investment environment due to frequently revised regulations and poor access to regulatory information (World Bank, 2018[13]).

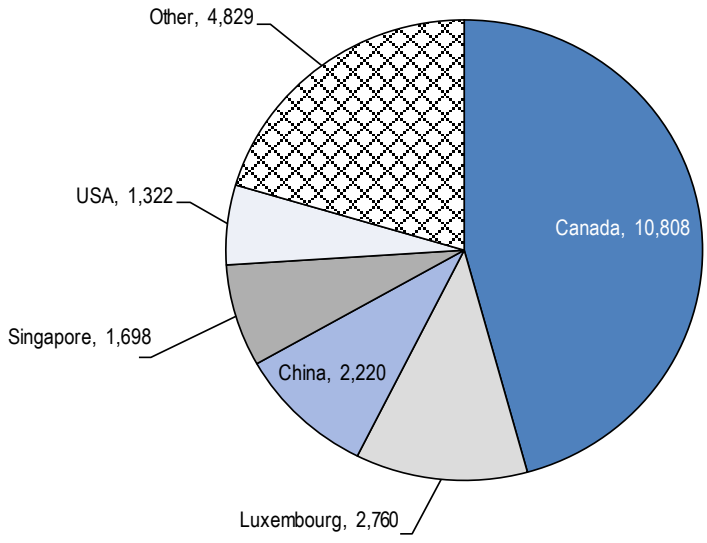
Until 2016, the Invest Mongolia Agency helped resolve investment disputes with the government, register companies and promote Mongolia as an attractive destination for foreign investment. The National Development Agency, the body that replaced the Invest Mongolia Agency in 2016 and acts as the coordinator for the implementation of the SDGs, is still in the process of developing its capacity to fulfil its role as an investment promotion and protection agency as effectively as its predecessor. As part of its continued development, the National Development Agency launched a one-stop service centre in February 2019 (Montsame News Agency, 2019[14]). An additional body, the Investment Protection Council, was also created to assist in investment disputes with the Mongolian government, but its performance has been hampered by resource constraints (US Embassy in Mongolia, 2018[11]).

Canada, whose mining companies are highly active in Mongolia, is Mongolia's most important source of foreign direct investment (FDI), accounting for 46% of total inflows between 2011 and 2018 (see Figure 6.2). To strengthen investment ties, the governments of Canada and Mongolia signed a Promotion and Protection of Investments Agreement that entered into force in 2017 (Government of Canada, 2016[15]). Other important investors include the European Union (17.3%, primarily Luxembourg, accounting for 12%) and China (14.7%, from People's Republic of China, 9.4%, and Hong Kong, China 5.3%). The Russian Federation is a comparatively small investor, making up only 0.5% of FDI.

Mongolia's public debt has risen in recent years, from 62.1% of GDP in 2015 to 87.6% of GDP in 2016, and is projected to rise. The risk of Mongolia defaulting on its loans is considered to be extremely high (Hurley, Morris and Portelance, 2018[16]). China plans to extend approximately USD 30 billion of credit to Mongolia for projects related to the Belt and Road Initiative (BRI), which will exacerbate Mongolia's risk of sovereign default (ITF, 2019[17]). The government recognises the growing debt problem in Mongolia and, in *Mongolia Sustainable Development Vision 2030* (for more information on Mongolia's strategic documents, see section 6.3), it set targets to reduce foreign debt to 58.6% of GDP by 2020, less than 50% by 2025 and below 40% by 2030 (State Great Hural of Mongolia, 2016[18]). Given the current trends in Mongolia's foreign debt, its 2020 target seems unlikely to be met.

Figure 6.2. FDI in Mongolia by source country, 2011-2018

USD millions



Source: Mongolian Statistical Information Service (2019[19]), *Foreign Direct Investment Inflows, by country*, Mongolian Statistical Information Service, http://www.1212.mn/tables.aspx?TBL_ID=DT_NSO_1500_004V1

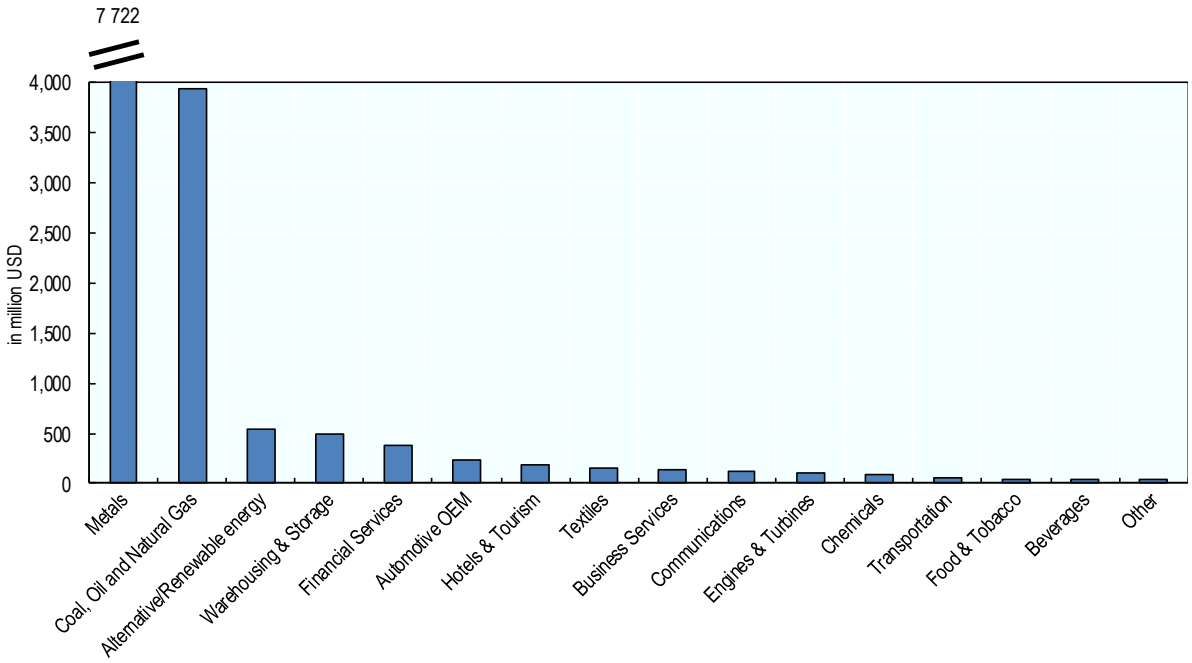
Mongolia's investment performance has varied widely over the past decade, following the evolution of commodity prices. From 2009 to 2013, Mongolia received considerably more FDI as a percentage of GDP than other lower-middle income countries, and in 2012, FDI flows to Mongolia amounted to 14% of GDP. More recently, however, FDI flows fell below the average in lower-middle income countries in 2014 and 2015 (World Bank, 2018[13]).

A key reason for this volatility is the concentration of FDI in the country's mining sector and the resulting link between commodity prices and FDI attractiveness. The mining sector attracted 71% of FDI in Mongolia in 2017, while the country's tourism and recreation sector received only 2%. Diversifying FDI flows could help achieve the Mongolia's stated goal of economic diversification, and Mongolia has several industries with the potential to attract considerable FDI, such as tourism, agribusiness and e-commerce (World Bank, 2018[13]).

Mongolia has attracted around USD 14.3 billion of announced cross-border greenfield FDI projects between 2003 and 2017, which is higher than Turkmenistan, but lower than Georgia's USD 16.9 billion and Uzbekistan's USD 26.8 billion. FDI is very concentrated into two sectors, namely metal, which attracts USD 7.7 billion or 54% of total greenfield FDI, and coal and natural gas with USD 4 billion (28%). A very small share of 4% goes into alternative or renewable energy. Infrastructure-related investments have been very limited. For instance, transportation receives around USD 61 million of total greenfield FDI (see Figure 6.3).

Figure 6.3. Greenfield FDI in Mongolia by economic activity, 2003-2017

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

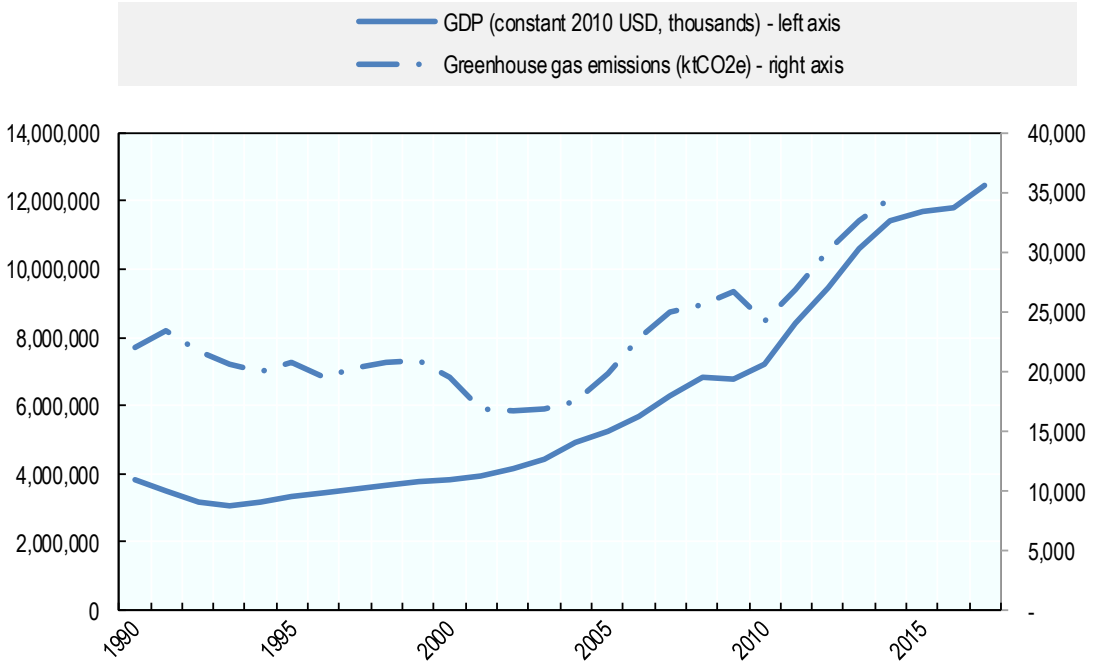


Note: Other includes Automotive Components, Consumer Products, Software & IT services, Medical Devices, Electronic Components, Real Estate, Industrial Machinery, Equipment & Tools
Source: OECD based on fDi Markets (2019[20]), *fDi Markets: the in-depth crossborder investment monitor (database)*, fDi Markets, https://www.fdimarkets.com/

Climate change

Due in part to the small size of its economy and population, Mongolia's share of total global greenhouse gas (GHG) emissions was approximately 0.06% in 2014, but its per capita emissions were 11.8 tCO_2e, which is just below the OECD average of 12.9 tCO_2e (Mongolian Statistical Information Service, 2018[21]; World Bank, 2019[1]). Unlike the other countries in the present study that were formally part of the Soviet Union, Mongolia's GHG emissions did not face the dramatic decline in the 1990s. However, given the importance of the Russian Federation to Mongolia as a trading partner, the country's GDP did contract by 20% between 1990 and 1993, and its GDP did not surpass its 1990 levels until 2001 (see Figure 6.4). Since the economy began growing more rapidly in the mid-2000s, the country's GHG emissions have also increased. The result of this decoupling is a dramatic decline in the emissions intensity of Mongolia's economy: Mongolia emitted 6.4 kg of CO_2e per USD of GDP in 1994, but by 2014, this figure had dropped to 3 kg of CO_2e (Mongolian Statistical Information Service, 2018[21]; World Bank, 2019[1]). This makes Mongolia's economy less emission-intensive than some Central Asian economies (notably Kazakhstan and Turkmenistan), but Mongolia's economy still emits 7.5 times more GHG than the OECD average to produce USD 1 of GDP.

Figure 6.4. GHG emissions and GDP of Mongolia (1990-2017)



Source: GDP from World Bank (2019[1]), *World Development Indicators (database)*, World Bank, https://datacatalog.worldbank.org/dataset/world-development-indicators; GHG data from Mongolian Statistical Information Service (2018[22]), "Greenhouse Gas removals and emissions, by sector, by main indicators, by year", http://www.1212.mn/tables.aspx?TBL_ID=DT_NSO_2400_015V3.

Agriculture is responsible for the largest share of Mongolia's GHG emissions. In 2014, agriculture accounted for 48.4% of total emissions, compared to 27.5% from energy industries. Other major contributors were manufacturing industries and construction (6.7%), transport (5.8%) and fugitive emissions from fuels (3.4%) (Ministry of Environment and Tourism of Mongolia, 2018[23]).

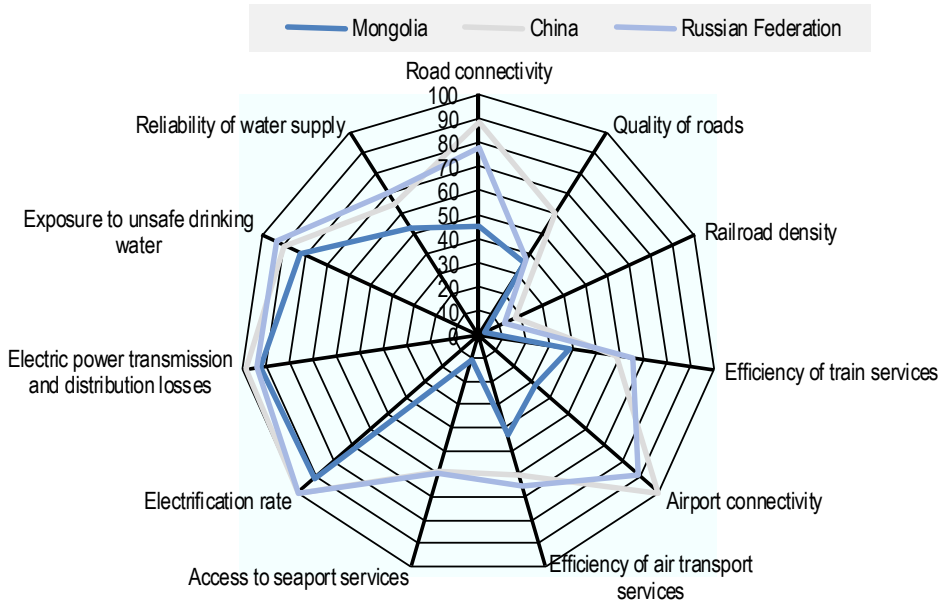
In September 2016, Mongolia ratified its Nationally Determined Contributions (NDCs) to the Paris Agreement in accordance with its 2014 *Green Development Policy* and associated 2016 *Action Plan*. Mongolia's overall commitment is to reduce GHG emissions by 14% by 2030 compared to Business-As-Usual (BAU). The Government of Mongolia is currently in the process of updating and elaborating more ambitious targets, with a vision to mobilise increased green financial resources from climate-related funds.

Climate change is already impacting Mongolia's water and forest resources as well as its soil and biodiversity. Mongolia's lakes are gradually drying up and disappearing, while many of the country's native species are losing their habitats to desertification and land degradation. According to a 2015 study, desertification and land degradation already affect 76.8% of Mongolia's territory, and rising temperatures and agricultural intensification are expected to exacerbate the situation (Ministry of Environment and Tourism of Mongolia, 2018[23]).

6.2. Mongolia's infrastructure needs and current plans

Mongolia's infrastructure, particularly its transport and water infrastructure, suffer from considerable deficiencies (see Figure 6.5), but the government has undertaken several large-scale infrastructure development projects to improve infrastructure service delivery. There has been almost no private sector participation in infrastructure projects, even in the form of public-private partnerships (PPPs), and the state continues to play an outsized role in the energy, transport and water sectors. The government does not allocate sufficient funds to the maintenance of existing infrastructure assets, prioritising greenfield projects instead. This has led to a cycle of 'build-neglect-rebuild' characterised by inefficiencies in spending as well as infrastructure service delivery (World Bank, 2018[24]).

Figure 6.5. Quality of infrastructure in Mongolia



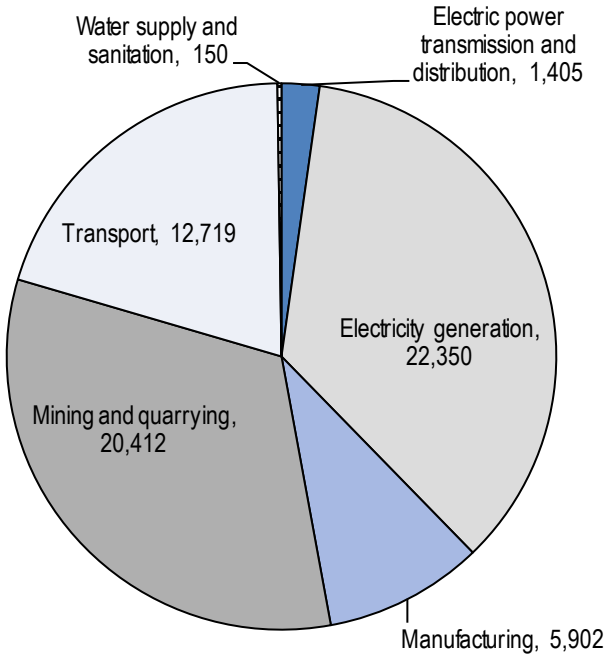
Source: World Economic Forum (2017[25]), *The Global Competitiveness Report 2017-2018*, World Economic Forum, http://www3.weforum.org/docs/GCR2017-2018/05FullReport/TheGlobalCompetitivenessReport2017%E2%80%932018.pdf

Out of the USD 62.9 billion of investment projects tracked in recent years, energy projects account for over 38% (USD 23.8 billion) of total investments, which are divided into electricity generation (over USD 22.4 billion or 94% of the total energy projects) and electric power transmission and distribution (USD 1.4 billion or 6%). Mining and quarrying projects follow suite, accounting for 32% (USD 20.4 billion) of investment projects (see Figure 6.6). Such mining projects reflect Mongolia's attractiveness as second in the world in terms of copper reserves, with over 8 000 individual deposits containing over 440 different minerals (SES Professionals, n.d.[26]). Mongolia's projects planned and under construction in the transport sector also account for over 20% or USD 12.7 billion, while manufacturing projects account for over USD 5.9 billion (or 9%).

Finally, water supply and sanitation projects only account for USD 150 million of investment projects planned and under construction.

Figure 6.6. Investment projects in Mongolia, by sector

Planned and under construction in USD million



Note: Electric Power Transmission and Distribution includes district heating projects, central transmission and distribution networks, double circuit transmission lines, Electricity generation projects include solar PV and wind projects, coal-fired, hydro, and natural-gas electric power plants. Manufacturing projects include cement, chemicals, coke and refined petroleum, basic metals, and other transport equipment. Mining and quarrying includes metal ores and coal and lignite extraction; Transport projects include intermodal projects, railways and roads. Water supply and sanitation projects include wastewater expansion, water, waste-water and sanitation investment programmes.
Source: OECD analysis based on accessed databases as of June 2019.

Transport

The poor quality of Mongolia's transport infrastructure contributes to high trade costs and prevents the country's integration into global value chains (GVCs). While it costs approximately USD 30 on average for one tonne of German goods to reach 20% of global GDP, it costs about USD 175 for one tonne of Mongolian goods to have the same market access. Even compared to the landlocked countries of Central Asia, that all perform poorly on this measure of connectivity, Mongolia's access to global GDP is particularly limited (ITF, 2019[17]).

Underinvestment, especially in maintenance, is a major factor in poor transport infrastructure and, consequently, increased costs. While other middle-income countries spend on average 0.75% of GDP on road maintenance, Mongolia's spending only amounts to 0.15% of GDP (ITF, 2019[17]). This spending gap is even larger than it appears. For example, due to the country's low population density and challenging

climate conditions, road maintenance costs are considerably higher in Mongolia than in more densely populated countries with milder climates (World Bank, 2018[24]).

To maintain even its current levels of network performance, Mongolia will need to increase its current road capacity by 84% by 2030 and by 284% by 2050, while its rail capacity must increase by 65% and 306% over the same period. Due to geographical location, Mongolia's rail network, run by Ulaanbaatar Railways, transports 90% of freight between China and the Russian Federation, which makes Mongolia's transport infrastructure of strategic importance not only domestically but also internationally (ITF, 2019[17]).

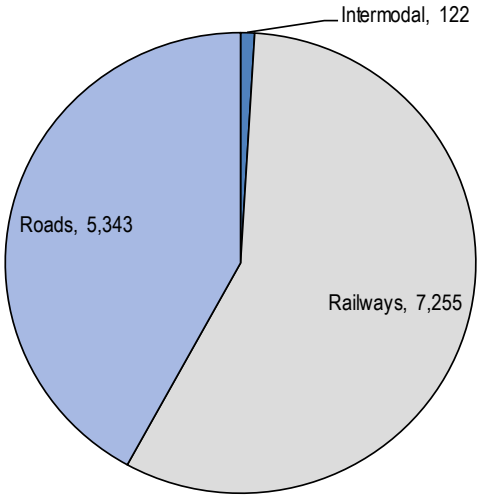
Cooperation among China, Mongolia and the Russian Federation has intensified in recent years. In 2015, the three countries' governments agreed to set up a joint railway transportation and logistics company (World Bank, 2018[24]). In 2016, they signed a programme laying out plans to develop the China-Mongolia-Russia economic corridor, including four rail and three road corridors through Mongolia. The programme's scope would extend beyond transport infrastructure to cooperation in energy, industry, agriculture and environmental protection (Ministry of Foreign Affairs of Mongolia, 2017[27]). Mongolia is also a key component of CAREC Corridor 4, which overlaps in part with the planned China-Mongolia-Russia transport corridors.

Recognising the country's transportation shortcomings, the government invested heavily in major initiatives such as "The Millennium Road" and, as a result, the length of Mongolia's national road network increased threefold over the past two decades. However, considerable infrastructure provision gaps remain. As of 2016, the national rail network extended to only seven of the country's 21 administrative regions (*aimag*), and only 16 benefit from paved road connections to the capital city (World Bank, 2018[24]).

Mongolia's transport infrastructure projects amount to about USD 12.7 billion, and consist mostly of railway projects (57% or around USD 7.3 billion) (see Figure 6.7). Investments in roads come second at around USD 5.3 billion (or 42%), followed by very small investments in intermodal projects such as logistics centres (1% or USD 122 million). Investment projects in the railways sector are mainly focused on domestic segments of regional infrastructure projects or railway infrastructure to carry mining products from Mongolia to China's border.

Figure 6.7. Transport projects in Mongolia, by sub-sector

Planned and under construction in USD million



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

In terms of the size of investments, the roads sector dominates the projects under construction while the railways dominate the planned projects (Table 6.2). Among the most significant transport projects currently under construction, the 1 000 km Altanbulag-Ulaanbaatar-Zamyn-Uud highway and the 547 km Erdenet-Ovoot Railway are considered vital to provide a link to economic and social opportunities, as well as to reduce Mongolia's high transport costs. The cost of the Altanbulag-Ulaanbaatar-Zamyn-Uud highway is around USD 3.5 billion and is considered one of the mega projects in Mongolia developed through a Public-Private Partnership (PPP) arrangement that would create more than 50 000 jobs (GoGo Mongolia, 2015[28]). The project's construction follows European standards, and it will be the main route connecting Asia and Europe. Another significant project currently under construction is the Western Regional Road Corridor, consisting of 290 km of roads connecting Mongolia's remote western region to a transport corridor that links Mongolia to Russian Federation in the north and China in the south. The project has long been part of Mongolia's national development strategy, and is financed by the ADB, which is the largest development partner in Mongolia.

Almost all of the most significant planned transport projects in Mongolia are promoted by Mongolia's National Development Agency, and mostly aimed at transporting coal and other minerals from various mines to the seaports in China. Such railway projects are very important to establish new transit routes for Mongolian mining companies that have low productivity and cannot compete in global markets. For example, the Ukhaa Khudag (South Gobi) - Gashuun Sukhait (Omnogovi) railway is expected to transport over 30 million tonnes of freight per year from Ukhaa Khudag to the Mongolia-China border of Gashuun Sukhait.

Such planned rail projects, while they aim at reducing the transportation costs, they are not mentioned in the long-term strategy document *Sustainable Development Vision 2030* and instead they seem to be undertaken with the business purpose of improving the transportation of mining products. *Sustainable Development Vision 2030* focuses on logistics centres, as well as roads and railroads. It aims to create transportation and logistics centres in Zamiin-Uud, Khushigiin Khundii and Atanbulagby 2020, extend asphalt roads for international and domestic travel by 1600 km (by 2020), an additional 800 km (by 2025) and an additional 470 km (by 2030). In the railroads sector, it also aims to build and operate the Ukhaa Khudag to Gashuun Sukhait line by 2020, complete Erdenet-Ovoot to Bogd khan (by 2025), as well as build new regional train lines by 2030. *Sustainable Development Vision 2030* also aims to reduce transportation costs in general, introduce a new modern public transit system in Ulanbaatar by 2025, and develop the air transport by completing the Khushig Khundii international airport by 2025 as well as develop airports in smaller cities.

Table 6.2. Hotspot projects in the transport sector in Mongolia

(a) Under construction					
Name	Sub-sector	Description	Project value (USD million)	Funding source	Type of investment
Altanbulag (Selenge)-Ulaanbaatar-Zamiin Uud (Dornogovi) Highway (PPP)	Road	Development of 1 000 km highway that will pass through 24 soums of six provinces and two districts of Ulaanbaatar. It is constructed in line with European standards and it will be the main route connecting Asia and Europe.	3 500	Chinggis Land Development Group	Greenfield
Erdenet-Ovoot Railway (547 Km)	Railway	Cconstruction of the 547 km Erdenet to Ovoot railway line in Mongolia. The railway line will be used to link the Ovoot coking coal power plant of Aspire Mining to the Trans-Mongolian Railway at Erdenet. The railway line will also improve freight links between Russia, Mongolia and China.	1 250	China Railway	Greenfield
Urban Transport Development Investment Program - Tranche 1	Road	The Investment Program – Tranche 1 aims to (i) develop the bus rapid transit (BRT) infrastructure and system; (ii) apply traffic management measures to increase traffic flow efficiency and safety; (iii) develop and implement parking, traffic and travel demand management policies; (iv) develop an efficient and sustainable public transport system; and (v) improve the public transport management and quality of services. The investment program will be implemented over a period of 10 years starting in 2012.	273	ADB; Mongolia	Brownfield
Western Regional Road Corridor Investment Program - Tranche 2	Road	Links Mongolia to the Russian Federation in the north and People's Republic of China in the south. The outputs of Tranche 2 will include 189.7 km of paved road constructed between Khovd and Ulaanbaishint, as well as three bridges (0.49 km) and 14.9 km of urban roads rehabilitated in the towns of Khovd and Ulgii.	125	ADB	Brownfield
(b) Planned					
Name	Sub-sector	Description	Project value	Funding source	Type of investment

			(USD million)		
Ukhaa Khudag (South Gobi) - Gashuun Sukhait (Omnogovi) Rail (Construction)	Railway	Construction of 225 km of rail, stretching from Ukhaa Khudag to the Mongolia-China border of Gashuun Sukhait. This rail line will be important for heavy-duty transportation, predicted to export 30 million tonnes of freight per year.	970	BNP Paribas, EBRD	Greenfield
Tavantolgoi-Gashuun Sukhait railway base infrastructure	Railway	Construction of 240 km long railway that will pass through the territories of Tsogttsetsii, Manlai, Bayan-Ovoo and Khanbogd. The railway will transport coal and copper from Tavantolgoi coal deposit and Oyu-Tolgoi copper mine to ports of Gashuunsukhait and Sehe. Expected freight per annum is 30 metric tonnes.	1 070	Shenhua Group, Sumitomo Corporation	Greenfield
Bogdkhan Railway Bypass Investment Program	Railway	Development of the transport network in Ulaanbaatar. The rail line will extend 170 km, and is estimated to transport 15-30 million tonnes of freight per year.	500	ADB, Government of Mongolia	Brownfield
250 km Special Proposed Road between Tavantolgoi and Gashuun Sukhait	Road	This project aims to curtail the cost of transport associated with the mining industry, and increase exports within the Umnugovi province. A preliminary feasibility study carried out in 2014 has been completed and the construction of the road is planned to be finished by 2021.	256	N/A	Greenfield
Nariinsukhait-Shiveekhuren Railway Base Infrastructure	Railway	The railway will transport coal freight from Nariinsukhait coal deposit through Shiveekhuren border to the People's Republic of China. The project is located in the territories of Gurvantes soum of Umnugovi aimag.	145	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. ADB = Asian Development Bank; EBRD = European Bank of Reconstruction and Development
Source: OECD analysis based on accessed data from ADB (2019[29]), IJGlobal (2019[30]), CSIS (2019[31]), Dealogic (2019[32]), World Bank as of June 2019.

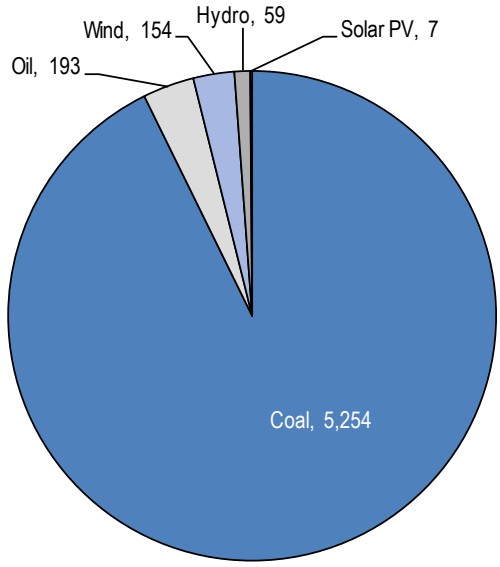
Energy

Mongolia's energy infrastructure is insufficient, and investments have failed to keep pace with the country's rapid economic growth. For instance, the country's total installed electricity generation capacity only barely covers peak demand, without necessary capacity expansion, growing demand could become too large for the combined capacity of domestic generation and electricity imports from the Russian Federation (World Bank, 2018[24]). The poor quality of Mongolia's electric grid, which leads to losses of 11.4% along transmission and distribution networks, exacerbates the situation (World Economic Forum, 2017[25]).

Unlike the other countries in the present study, all of which were constituent republics of the Soviet Union, Mongolia has not achieved universal electricity access; almost a tenth of the population has no access to electricity (World Economic Forum, 2017[25]). Less than a quarter of the population has access to central or district heating, and the population instead rely on coal-fired boilers and cook stoves for heat during Mongolia's extremely cold winter months. Due in part to inefficient heating methods, the capital suffers from very poor air quality (World Bank, 2018[24]).

Mongolia generates the vast majority (93%) of its electricity from coal-fired thermal power plants (see Figure 6.8), most of which were built between 1960 and 1980 and run on outdated technology. Many will soon need to be decommissioned. The rise in Mongolia's overall GHG emissions has been accompanied by increased emissions in the energy sector: They increased by approximately 50% between 1990 and 2016. Renewable energy sources, including hydroelectric dams, wind and solar, have made modest gains in recent years thanks to generous feed-in tariffs, increasing from just 1% in 2013 to about 4% in 2016 and almost 7% by 2018 (World Bank, 2018[24]).

Figure 6.8. Electricity generation by fuel (GWh, 2016)



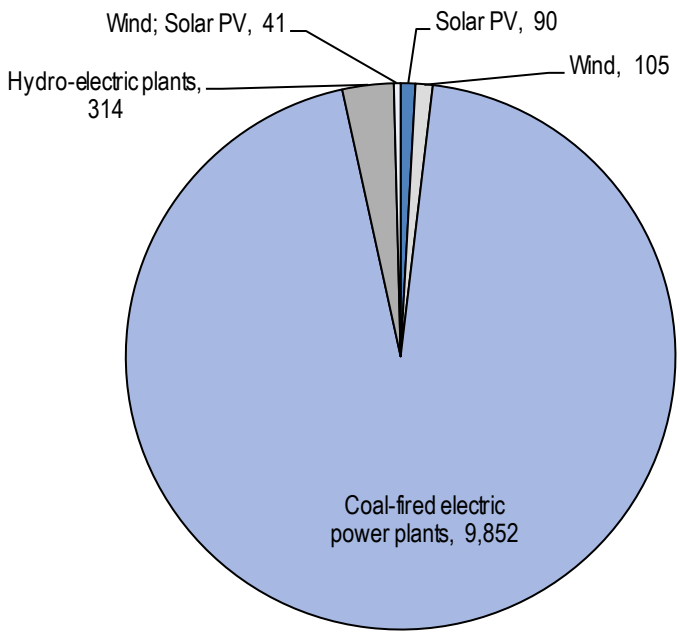
Source: International Energy Agency (2018[33]), *IEA World Energy Balances 2018*, International Energy Agency https://webstore.iea.org/world-energy-balances-2018

Mongolia is a net exporter of energy, primarily due to its abundant coal deposits, but it is a net importer of electricity. It relies on coal not only as a source of domestic electricity generation but also for exports. Mongolia exported 9.8 Mtoe and 16.1 Mtoe of coal in 2015 and 2016 respectively (IEA, 2018[33]), and coal briquettes accounted for 33% of Mongolia's exports by value in 2017 (Observatory of Economic Complexity, 2017[9]). Mongolia has a small oil industry that usually covers domestic demand. In 2015, Mongolia was a net importer (0.05 Mtoe), but in 2016 it was a net exporter (0.10 Mtoe). To satisfy periods of heightened demand, Mongolia relies on electricity imports from the Russian Federation, importing 0.12 Mtoe of electricity in both 2015 and 2016 (IEA, 2018[33]).

In terms of investment projects in electricity generation, 95% of the investments by capacity are in coal-fired electric power plants (or 9 854 MW), while hydro power plants only account for 3% of the total (see Figure 6.9). Coal-fired power plants feature prominently among Mongolia's largest infrastructure projects in the energy sector, but a few capital-intensive renewable projects are also under construction (Table 6.3). Among the projects under construction, the Baganuur Coal-Fired Power Plant and the Buuruljuut Coal-Fired Power Plant have capacity of 700 MW and 600 MW respectively,

and each costing USD 1 billion. Mongolia has also planned several other large-scale large coal-fired plants with values ranging from USD 5.8 billion for the 5 280-MW Shivee Ovoo Project, to USD 1 billion for the 600-MW Tevshiin Gobi Mine Mouth Power Plant. By comparison, the country's renewable projects are much smaller and contribute much less to generation capacity: The Tsetsii wind farm is valued at USD 501 million and has a capacity of only 50 MW, while the Sainshand wind farm costs USD 120 million and has 55 MW of capacity. The purpose of wind projects is to reduce the carbon intensity of Mongolia's economy and energy systems and diversify away from coal. To support increased renewable energy integration, Mongolia recently adopted a new renewable energy law that revises feed-in tariffs and establishes an auction scheme. However, on the whole, current investments closely resemble historical development patterns and do not contribute meaningfully to diversification goals. Many large-scale projects do not align with the *Sustainable Development Vision 2030* strategy document, which aims to increase the use of renewables for electricity generation by 30% and start using electricity from nuclear power plants by 2030.

Figure 6.9. Electricity generation projects in Mongolia, by fuel



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

Table 6.3. Hotspot projects in the energy sector in Mongolia

(a) Under construction						
Name	Sub-sector	Description	Project value (USD million)	Capacity (MW)	Funding source	Type of investment
Baganuur Coal Fired Power Plant	Coal-fired power plant	Construction of a coal plant in Baganuur, east of the capital Ulaanbaatar. The power plant will incorporate two coal-fired power generator units with a capacity of 350 MW per unit. The power plant is expected to begin its operations in 2021.	1 000	700	Baganuur Power LLC (100%)	Greenfield
Buuruljuut Coal Fired Power Plant	Coal-fired power plant	Construction of a coal-fired power plant 120 km from Ulaanbaatar, in Dundgovi Province. The source of the coal will originate from the nearby Buuruljuut mine, which supplies brown coal. The project aims to build the power plant in two phases (2 x 300 MWe), one unit will be built by 2019 and the second unit will be completed by 2022.	1 000	600	Bodi International Group, China State Construction Engineering Group	Greenfield
Tsetsii Wind Farm Phase II	Wind farm	Construction of a wind farm with a capacity of 50 MWe. When constructed the project will become the second largest in Mongolia, following the 50 MWe Salkhit wind farm.	501	50	Newcom Group (51%), SoftBank (49%)	Greenfield
KEPCO KDN-Mongolia Solar PV Park 1, 2, 3	Solar PV	N/A	282	N/A	N/A	Greenfield
Sainshand Wind Farm	Wind farm	Construction of 25 Vestas V110 2.2 MW turbines, located 450 km southeast of Ulaanbaatar near Sainshand city. The wind farm is expected to produce 190 GWh of electricity per annum, and is being constructed in line with EBRD's 'Green Economy Transition Approach'.	120	55	EBRD, EIB	Greenfield
(b) Planned						
Name	Sub-sector	Description	Project value (USD million)	Capacity (MW)	Funding source	Type of investment
Shivee Ovoo Project	Coal-fired power plant	Construction of a coal-fired electric power plant in the Gobi-Sumber province, 260 km southeast of Ulaanbaatar. The power generated by the proposed power plant is expected to be exported to China.	4 000	5 280	Erdenes Shivee Energy, LLC (Mongolia)	Greenfield
Tavan Tolgoi power station (Rio Tinto)	Coal-fired power plant	Construction of a 300 MW coal-fired power station to provide power for the Oyu	1 500	300	Oyu Tolgoi LLC	Greenfield

		Tolgoi copper mine in Mongolia. It is projected to be in service by 2023.				
Ulaanbaatar Thermal Power Plant-5	Coal-fired power plant	The CHP5 coal-fired combined heat and power plant is located in Ulaanbaatar, Mongolia. The power plant has a capacity of 415 MW of power and 587 MW of steam. The plant's output will be purchased by the Mongolian government via power purchase agreement and the steam produced will be used for city heating in Ulaanbaatar. The operations were expected to begin in 2017.	1 200	415	Sojitz Corporation (30%); POSCO (30%);Newcom Group (10%), GDF Suez (UAE) (30%)	Greenfield
600 MWe Chandgana Power Plant	Coal-fired power plant	Construction of a coal-fired electric power plant, 300 km east of Ulaanbaatar in Murun soum. The plant will be situated near the Chandgana Tal coal deposit with an estimated reserve of 124 million tonnes of coal. The power plant is planned to be constructed in two phases, both phases being 300 MWe (2 x 150 MWe).	1 000	600	Prophecy Coal Corporation (100%)	Greenfield
Tevshiin Gobi Mine Mouth Power Plant	Coal-fired power plant	Construction of a coal-fired power plant at the mouth of the Tevshiin Gobi coal mine in the Dundgovi province. A feasibility study was carried out and approved by the Mongolian Ministry of Energy in 2013.	1 000	600	Government of Mongolia (100%)	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. EBRD = European Bank of Reconstruction and Development; EIB = European Investment Bank
Source: CSIS (2019[31]), EBRD (n.d.[34]), IEEFA (2019[35]), IJGlobal (2019[30]), Invest in Mongolia (n.d.[36]), SourceWatch (2019[37]), Thomson One (2019[38]) as of June 2019.

Industry and mining

Over the past few years the mining sector was responsible for about 24% of Mongolia's GDP (Mongolian Statistical Information Service, 2019[3]), 60% of its industrial output and 80% of total exports, even though it only employs about 2% of the country's total labour force. By contrast, agriculture, including Mongolia's sizeable herding industry, employs about a third of the labour force but represents only about 13% of GDP. Raw hair fibres from cashmere goats are one of Mongolia's most important non-mineral exports, but Mongolia's role in finished textiles and higher value-added textile products is limited. The rise of the mining sector and relative decline of agriculture and other sectors have led to a chronic lack of economic diversification, with exports relying heavily on mining products to one market, China (World Bank, 2018[24]).

Recognising the vulnerability of the economy to commodity price shocks and other risks associated with the dominance of a single industry, the government has made diversification a priority in its strategy, *Mongolia Sustainable Development Vision*

2030. The strategy aims to increase the share of manufactured and processed goods in Mongolia's exports to 15% by 2020 and to 25% by 2025. Within the textile industry, the government has set a goal of increasing the share of processed products in the exports of leather, wool and cashmere goods to 15% of total textile exports by 2020 and 80% by 2030. It also aims to develop domestic gold refining and copper smelting industries rather than exporting raw ore and gold, and it aims to increase the domestic manufacturing capacity of chemical fertilisers (State Great Hural of Mongolia, 2016[18]).

Most investments in Mongolia's industry and mining sectors are concentrated in mining projects (Table 6.4). Such projects represent large and long-term investments that are expected to help Mongolia become one of the world's leaders in mining. For example, the Oyu Tolgoi copper-gold mine project has an estimated investment amount of USD 7 billion and is expected to function for approximatively 100 years, and to become the world's third largest copper producer at peak metal production by the year 2025. Other projects such as the Tavan Tolgoi reserve is estimated to contain 7.5 billion tonnes of high-grade coking coal, but in recent years its development has been slowed due to funding issues and concerns over the role that foreign firms are expected to play in this project. Projects contributing to Mongolia's diversification goals are absent from current large-scale investments and further entrench the country's reliance on coal and lignite mining (see Figure 6.10).

Table 6.4. Hotspot projects in the industry and mining sector in Mongolia

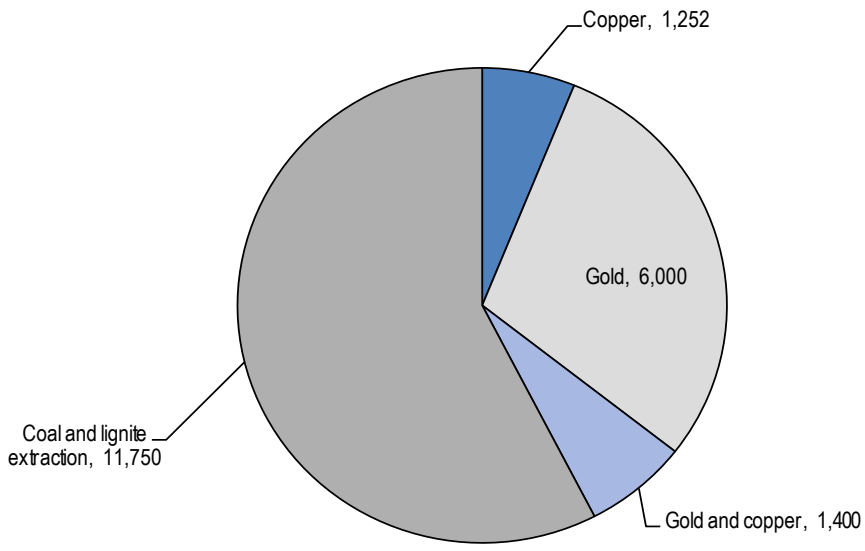
Name	Sub-sector	Description	Project value (USD million)	Status	Funding source	Type of investment
Tavan Tolgoi Coal Mine Project	Mining and quarrying	Largest undeveloped coking coal mine in the world, with 7.4 billion tonnes of estimated reserves. It is located in the south of Mongolia, 240 km north of the Chinese border.	7 000	Planned	Shenhua Group Corp Ltd, Peabody Energy Corp	N/A
Oyu Tolgoi Copper-Gold Mine	Mining and quarrying	Located 80 km north of the Mongolia-China border, it has the potential to function for approximately 100 years from five known mineral deposits. The Oyu Tolgoi reserve contains a total of 2.7 billion tonnes of iron-ore, including more than 1 000 tonnes of gold and 25.4 million tonnes of copper. The mine will produce 430 000 tonnes of copper and 425 000 ounces of gold annually. It is expected to become the world's third largest copper producer at peak metal production by the year 2025.	5 800	Under construction	Turquoise Hill Resources (60%), Government of Mongolia (34%)	Brownfield
Tavan Tolgoi Coking Coal Mine	Mining and quarrying	Situated 240 km from the Chinese border in south Mongolia. The Tavan Tolgoi reserve is estimated to contain 7.5 billion tonnes of high-grade coking coal. However, development has been repeatedly slowed due to financing difficulties and concerns related to the role played by foreign firms.	4 000	Under construction	Government of Mongolia (100%)	Greenfield

Tsagaan Suvarga Copper Mine Project	Mining and quarrying	Fourth largest mine in Mongolia, located in the Dornogovi province, 300 km from the Chinese border. The mine is owned by the Mak Company. The project involves the installation of a 14.6 million tonne per annum copper-molybdenum concentrator, as well as other related infrastructure, such as a 280 km power line.	869	Planned	Mongolyn Alt (MAK) Group	N/A

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.
Source: OECD based on EBRD (n.d.[34]), IJGlobal (2019[30]), Thomson One (2019[38]) as of June 2019.

Figure 6.10. Mining projects in Mongolia

by sub-sector



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

Water

Mongolia's water supply and sanitation infrastructure is of very poor quality. Almost 20% of the country's population is exposed to unsafe drinking water, while the reliability of its water supply ranked 100th out of 140 countries in the World Economic Forum's Global Competitiveness Report, much lower than other countries of its income category (World Economic Forum, 2017[25]). In *Mongolia Sustainable Development Vision 2030*, the government aims to increase access to clean drinking water to 80% by 2020, 85% by 2025 and 90% by 2030. It also aims to increase the share of the population using improved sanitation and hygiene to 40% by 2020, 50% by 2025 and 60% by 2030 (State Great Hural of Mongolia, 2016[18]).

Mongolia's average national rates of per capita freshwater abstraction are very low, but due to the scarcity of water, withdrawals regularly exceed renewable water supply by as much as 50% annually. In the Ulaanbaatar capital region and in the southern Gobi Desert the deficit is even greater. Mongolia's main industries, mining and herding, have

considerable negative impacts on water availability and quality (World Bank, 2018[24]). Out of the USD 62.9 billion of investments tracked in Mongolia over recent years, the water sector accounts for a small share of investments, which are mostly for water supply and sanitation, totalling USD 150 million.

6.3. 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

Mongolia has produced a plethora of strategic documents with environmental concerns playing a central role, notably a long-term strategy, Mongolia Sustainable Development Vision 2030 (for a list of Mongolia's strategic documents, see Table 6.5), was adopted in 2016. In addition to setting clear, quantitative goals for overall economic development, climate change mitigation and sectoral transformation (e.g. renewable energy penetration, transport link improvements), the strategy explicitly identifies state officials responsible for particular actions. It also mandates biennial monitoring, evaluation and reporting on progress towards the Vision's goals and establishes a standing committee within the State Great Khural (Mongolia's unicameral parliament) to oversee implementation (State Great Hural of Mongolia, 2016[18]).

Mongolia has made environmental protection and climate change-related policies central to its vision of long-term development. The Mongolia Sustainable Development Vision 2030 complements Mongolia's green development policy, Action Plan, Green Development Policy of Mongolia (2014-2030), which it adopted in 2014. Both strategies focus on economic diversification, participation of Mongolian firms higher up global value chains in key high-employment industries (e.g. textiles, agriculture) and safeguarding the environment through improved regulations and increased resource and energy efficiency. The Green Development Policy lays out a step-by-step action plan for achieving long-term mitigation goals and specifies the government bodies responsible for implementation and possible funding sources, but it does not provide budget estimates (Ministry of Environment, 2014[39]).

The Mongolian government has produced long-term development strategies for some specific sectors, but other sectors have not benefited from similar sectoral plans. Mongolia adopted its State Energy Policy (2015-2030) in 2015 as a follow-up to its earlier National Renewable Energy Policy (2005-2020). The Policy defines goals for renewable energy penetration into the country's energy mix and energy efficiency measures. Similarly, Mongolia adopted its National Mongolian Livestock Programme in 2010 with phased objectives covering 2010-2015 and 2016-2021. It focuses on rehabilitating degraded rangeland and improving livestock productivity and resilience under climate change.

However, the transport sector, which has been identified as a priority for better integrating the Mongolian economy into international trade, does not have a plan of similar scope. In collaboration with the Asian Development Bank, Mongolia adopted a strategy, Road Sector Development to 2016, in 2011, but a follow-up strategy in line with the country's 2030 development vision has not yet been adopted. Transport-related objectives on road, rail and air infrastructure feature in the Mongolia Sustainable Development Vision 2030, but the transport sector does not have a detailed sector-specific action plan for future development.

Moreover, Mongolia has not yet elaborated a long-term vision extending to the mid-century. Mongolia should develop a vision for its long-term transition through, for example, the creation of a long-term low-emission development strategy as encouraged by Article 4 paragraph 19 of the Paris Agreement. Considering Mongolia's continued construction of coal-fired power plants, a long-term vision for emissions reduction and a transition towards more sustainable energy sources could better inform the government of the risks of its decisions to approve such coal plant projects.

Overall, Mongolia's strategic document system is coherent and has a clear hierarchical structure. Mongolian legislation clearly defines a three-level hierarchy of planning documents consisting of 15-20 year development concepts, 8-10 year policy documents (state policies, regional development policies) and 3-5 year plans (government action plans, regional action plans, national programmes). Mongolia also publishes one-year policy documents that define budgets and short-term interventions (UNECE, 2018[40]). This system does not, however, allow for the longer-term, mid-century planning process that the UNFCCC recommends for defining and scaling up national ambitions to address climate change.

Institutional set-up and decision making processes

Mongolia's government bodies lack sufficient capacity to carry out long-term planning exercises effectively and, crucially, to monitor implementation. Civil society organisations have also criticised existing accountability mechanisms, facilitating influence from vested interests (World Bank, 2018[24]). Institutional instability and high staff turnover also impair the government's ability to deliver on policy objectives. Incoming governments regularly replace most policies and staff in government bodies following parliamentary elections, and efforts to enhance the country's long-term planning capabilities are limited to single 4-year terms. After the 2012 elections, for instance, a Ministry of Economic Development was created explicitly to support long-term planning, but after the 2016 elections the ministry ceased to exist (Bertelsmann Stiftung, 2018[41]). A high staff turnover rate is a particularly difficult challenge in the Ministry of Environment and Tourism, which struggles to comply with international obligations due to capacity constraints and poor institutional memory (UNECE, 2018[40]).

Even though government bodies suffer from instability and major capacity constraints, Mongolia has developed consistent frameworks of environmental legislation and strategic planning documents. However, implementation and enforcement of such policies remains a major challenge. For instance, the government has striven to improve mining policies and legislation with environmental requirements such as mandatory environmental impact assessments (EIAs). The EIAs, however, are deficient because they occur late in the permitting process, and information is rarely disclosed on agreements between mining companies and local authorities on environmental protection measures (UNECE, 2018[40]). EIAs on mining operations in Mongolia often do not capture the impacts of related infrastructure projects on wellbeing and other economic activities. Mining-related service roads, for instance, threaten rangelands required for the herding industry and contribute to land degradation and air pollution (World Bank, 2018[24]). Additionally, obligatory strategic environmental assessments (SEAs) have been part of Mongolia's legislation on EIAs since 2012 but as of 2017 no SEA has ever been carried out in compliance with the law (UNECE, 2018[40]).

List of relevant strategic documents

Table 6.5. Main strategic documents in force

	Status	Time Horizon	Sectoral Coverage	Main objectives
First Nationally Determined Contribution (NDC)	Submitted in 2016	2016-2030	Economy-wide	• Target: a 14% reduction in total national greenhouse gas emissions (excluding LULUCF) by 2030 • Main sectors for emission reduction: Energy sector (increase renewable electricity capacity from 7.62% in 2014 to 20% by 2030, reduce electricity transmission loss from 13.7% in 2014 to 7.8% by 2030), Transport sector (improve national paved road network, increase the share of hybrid road vehicles from around 6.5% in 2014 to 13% by 2030), Industry sector (decrease emissions in the cement industry by modernising the technologies and mechanisms in place) • Adaptation priorities: to maintain availability of water resources, to reduce forest degradation rate (see list of strategic documents)
Mongolia Sustainable Development Vision 2030	Adopted in 2016	2016-2030	Governance, transport, energy, water, industry	• Create a favourable business and investment environment • Supply 90% of the population with safe drinking water and 60% with improved sanitation by 2030 • Decrease greenhouse gas emissions by 14%, by introducing more renewable energy sources • Increase the share of recycled waste to 40% of the total waste produced • Expand environmentally protected areas to 30% of the country's territory and increase forest cover to 9% of the total territory • Ensure social equality through inclusive economic growth
Action Plan, Green Development Policy of Mongolia	Adopted in 2014	2014-2030	Governance, transport, energy, water, industry	• Promote resource efficient, low-carbon intensive production and consumption • Advocate for investment in in clean, environmentally friendly technology • Increase productivity whilst ensuring ecologically safe and minimal-waste production • Introduce 38 green development indicators to measure progress and ensure they are actively used • Maintain an ecosystem balance and mitigate environmental degradation

State Energy Sector Policy	Adopted in 2015	2015-2030	Energy	• Decrease greenhouse gas emissions by 20% in the energy sector by 2020 • Increase the share of renewable energy sources by 30%, by 2030 • Ensure a secure and reliable supply of energy on a national scale • Develop mutually beneficial relationships with neighbouring countries to ensure regional energy security • Ensure the transition of the energy sector towards the private sector • Introduce new, efficient and environmentally friendly technology to the energy sector
Governmental Action Programme for the period 2016-2020	Adopted in 2016	2016-2020	Governance, transport, energy, water, industry, mining	• Promote "green" development in line with the Green Development Policy • Introduce waste-water recycling technology (e.g. to be re-used in industrial production processes) • Promote a favourable investment climate for the geology and mining sector • Ensure the development of education standards in both urban and rural spaces
National Programme on Reduction of Air and Environmental Pollution	Adopted in 2017	2017-2025	Governance, transport, energy, water, industry	• Introduce environmentally friendly and advanced technology in all economic sectors to reduce pollution • Enhance legal environmental measures and create a more accountable government system • Ensure the prohibition of raw coal usage • Increase community participation in reducing environmental pollution • Improve urban planning and policy making to reduce air pollution, especially in Ulaanbaatar
National Action Programme on Climate Change	Adopted in 2011	2011-2021	Governance, transport, energy, water, industry	• Encourage research related to climate change to inform policy makers • Increase the participation of the population in mitigating the adverse effects of climate change • Introduce innovative technologies to all economic sectors
National Ozone Layer Protection Programme for the period 1999-2030	Adopted in 1999	1999-2030	Governance, transport, energy, water, industry	• Implement a licensing and quota system for HCFC imports and exports
National Action Programme to Combat Desertification for the period 2010-2020	Adopted in 2010	2010-2020	Water	• Strengthen the institutional capacity and develop a policy framework to combat desertification • Rehabilitate degraded and vulnerable areas affected by desertification
Green Belt National Programme	Adopted in 2005	2005-2035	Water	• Create a "green belt" between the Mongolian Gobi and Steppe regions through the process of afforestation • Reduce the present loss in forest reserves • Mitigate desertification and associated sand storms

National Biodiversity Programme for the period 2015-2025	Adopted in 2015	2015-2025	Governance, energy, water, industry	• Conservation of biodiversity in the country • Sustainable and rational use of natural resources
Water National Programme	Adopted in 2010	2010-2021	Water, Industry	• Ensure the protection, conservation and natural replenishment of water resources • Provide the population with drinking water that complies with necessary health standards • Improve the supply of water to the agricultural and industrial sector
Waste Management Improvement Programme for 2014-2022	Adopted in 2014	2014-2022	Governance, Industry, Water	• Increase the number of waste sites that meet sanitary requirements form 3 in 2013 to 40 by 2022 • Increase the share of recycling from 4.4% of total waste in 2013 to 12% by 2022 • Restore degraded environmental areas caused by waste contamination
National Implementation Plan for the Convention on Persistent Organic Pollutants	Adopted in 2006	2006-2030	Energy, water, industry	• Reduce the release of persistent organic pollutants (POPs) into the environment and atmosphere • Phase out the use of polychlorinated biphenyl
Gold-2 National Programme	Adopted in 2017	2017-2020	Mining, Industry	• Intensify gold exploration and mining activity • Ensure the long-term development of the gold industry • Develop legislation for the gold industry
National Strategy on Ensuring Road Traffic Safety for the period 2012-2020	Adopted in 2012	2012-2020	Transport	• Decrease the number of deaths and injuries occurring on roads by 50% by 2020 • Implement effective traffic and road network planning
National Tourism Development Programme	Adopted in 2015	2016-2025	Governance, transport, energy, water, industry	• Develop tourism into a leading economic sector in line with international standards • Promote eco-tourism and ensure environmental protection in the tourist industry • Construct an efficient road network to allow for ease of mobility

Table 6.6. Other relevant documents

	Status	Time Horizon	Sectoral Coverage
Road Sector Development to 2016	Adopted in 2011	2011-2016	Transport
"Transit Mongolia" Programme	Adopted in 2008	2008-2015	Transport
National Forest Programme	Adopted in 2001	2001-2015	Multi-sector
National Programme on Forest Tending	Adopted in 2014	2014-2018	Multi-sector
National Programme on Special Protected Areas	Adopted in 1998	1998-2015	Multi-sector
Waste Management Strategy and Action Plan for the period 2009-2013	Adopted in 2009	2009-2013	Multi-sector
National Programme for Food Security	Adopted in 2009	2009-2016	Multi-sector
Action Plan of the Khatan Tuul National Programme for 2012-2016	Adopted in 2012	2012-2016	Water
State Policy on Petroleum for the period until 2017	Adopted in 2011	2011-2017	Mining, Industry

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Chapter 7. Trends in Tajikistan's sustainable infrastructure investments

This chapter describes sustainable infrastructure planning in Tajikistan and presents current trends in investment in large-scale infrastructure projects. It compares Tajikistan's infrastructure plans in the energy, transport, industry and water sectors against its international commitments under the Paris Agreement on climate change and the Sustainable Development Goals (SDGs). The chapter also explores Tajikistan's strategic documents for long-term economic development, sectoral development and the environment, including those related to climate change mitigation and adaptation. It identifies misalignments between stated goals and observed investment flows and provides recommendations to improve strategic planning for sustainable infrastructure.

Overview

Tajikistan is the only country in the former Soviet Union that the World Bank classifies as a low-income economy. Its population is predominantly rural, with the lowest urbanisation rate of Central Asia at 27%. Over the next 15 years, the government faces the challenge of providing adequate infrastructure and employment opportunities for the over 45% of the population who were under the age of 20 in 2015. Agriculture remains an important pillar of the economy accounting for 21% of GDP, but climate change poses major threats to the sector. The country has lost 20% of its glacier cover since 1950, and certain parts of the country (the south, western Pamir and the mountains of central Tajikistan) could face up to 5°C of warming by the end of the century.

While Tajikistan has a relatively well-developed regulatory framework for investment, the poor implementation of these regulations has led to an unpredictable and non-transparent regulatory environment for investors to operate (weak rule of law and judiciary system, corruption). The country ranks 126th in the World Bank's Ease of Doing Business index, and the country's domestic private sector plays only a limited role in the economy. Tajikistan's strategy to attract FDI flows, mainly in metal extraction, coal oil and gas and renewable energy, has resulted in a high risk of debt stress. The country's debt equalled 50% of GDP in 2017 compared to 30% in 2015, and 80% of the debt is to one single creditor, China's Export-Import Bank. Payment defaults have led to debt settlements including licenses for mineral extraction and even the transfer of sovereignty over disputed territory.

Tajikistan's infrastructure is poor, contributing to very high trade costs that restrict the country's access to nearby markets such as the People's Republic of China and Afghanistan as well as the Russian Federation, a major export destination. Deteriorating Soviet-era infrastructure assets such as irrigation channels, roads, dams, bridges and river embankments have increased the population's exposure to risks associated with extreme weather events and earthquakes. 83% of the roads are unpaved, and would need upgrading to anticipate the increase freight and passenger traffic linked to the CAREC Corridors and the BRI. Planned rail projects aim to improve the connectivity of the country with neighbouring markets, through the construction of long-distance rail lines (e.g. the Russia-Kazakhstan-Kyrgyz Republic-Tajikistan railway and the China-Kyrgyz Republic-Tajikistan-Afghanistan-Iran railway). The overall quality of Tajikistan's energy infrastructure is poor. Although the country has achieved universal access to electricity, existing systems function inefficiently and improved energy security is one of the government's top priorities for future development through the development of renewable energy sources (hydropower, representing 94% of planned energy projects, and coal-fired power plants representing 6%). The large-scale Roghun hydroelectric dam is the country's flagship energy project, but it has ignited controversy for its socio-environmental impacts both nationally and in downstream countries.

While Tajikistan has development strategies to 2030 – such as the *National Development Strategy for the period to 2030* and the *Sustainable Development Transition Concept* -, the country currently lacks a mid-century strategy, against which shorter-term documents could be benchmarked. The country does not adequately account for environmental concerns in policy-making, and its government body in charge of environmental protection, the Committee on Environmental Protection, lacks influence. Without a system of intermediate and final evaluation for investment projects and mechanisms for screening investment projects against national development and

environmental goals, Tajikistan has not been sufficiently selective in its approach to foreign investments.

7.1. State of play: economy, investment and climate change in Tajikistan

Economy and trade

Table 7.1. Key indicators on Tajikistan's economy

Population (2018)	9 100 837
Urbanisation rate (2018)	27%
Annual population growth (2018)	2.5%
Surface area	141 380 km^2
GDP (USD, current price, 2018)	7 523 million
GDP per capita (USD, current price, 2018)	827
Real GDP growth (year-on-year change, 2019)	5%
Inflation (average consumer price, y-o-y change, 2016)	6.0%
Exports of goods and services (% of GDP, 2017)	15.7%
Imports of goods and services (% of GDP, 2017)	40.9%
FDI, net inflows (% of GDP, 2018)	2.9%
General government net lending/borrowing (% of GDP, 2019)	-4.7%
Unemployment (% of total labour force, 2018)	10.9%
Remittances (% of GDP, 2018)	29.0%
Transparency, accountability and corruption in the public sector rating (1= most corrupt, 6 = least corrupt, 2017)	2.5

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

Tajikistan is the only country in the former Soviet Union categorised as a low-income economy by the World Bank.[i] Tajikistan's population is predominantly rural; it has the lowest urbanisation rate of any country in Central Asia at 27% (see Table 7.1). Tajikistan's government has referred to the next fifteen years as the 'demographic window of opportunity', during which the government faces a challenge of providing adequate infrastructure and employment opportunities for the over 45% of the population who were under the age of 20 in 2015 and many of whom will enter the work force by 2030 (Ministry of Economic Development and Trade of the Republic of Tajikistan, 2016[3]).

Tajikistan's GDP plummeted in the 1990s following the breakup of the Soviet Union, falling from USD 6.8 billion in 1990 to USD 2.1 billion in 1996 before recovering. It did not surpass its pre-independence levels until 2013. The service sector accounts for the largest portion of Tajikistan's economy at 41%, but industry (27%) and agriculture (21%) remain important. Agriculture's share of GDP is the largest in the region (World Bank, 2019[1]).

Tajikistan's economy is highly reliant on remittances from abroad, primarily from Russia. These remittances, which amounted to 29% of the country's GDP in 2018,

fluctuate in accordance with the business cycles of the countries where the migrant workers are employed. Tajikistan's economy is also characterised by limited private sector involvement, with private sector companies accounting for only about 3-4% of GDP and approximately 11% of employment (IDA, 2019[4]).

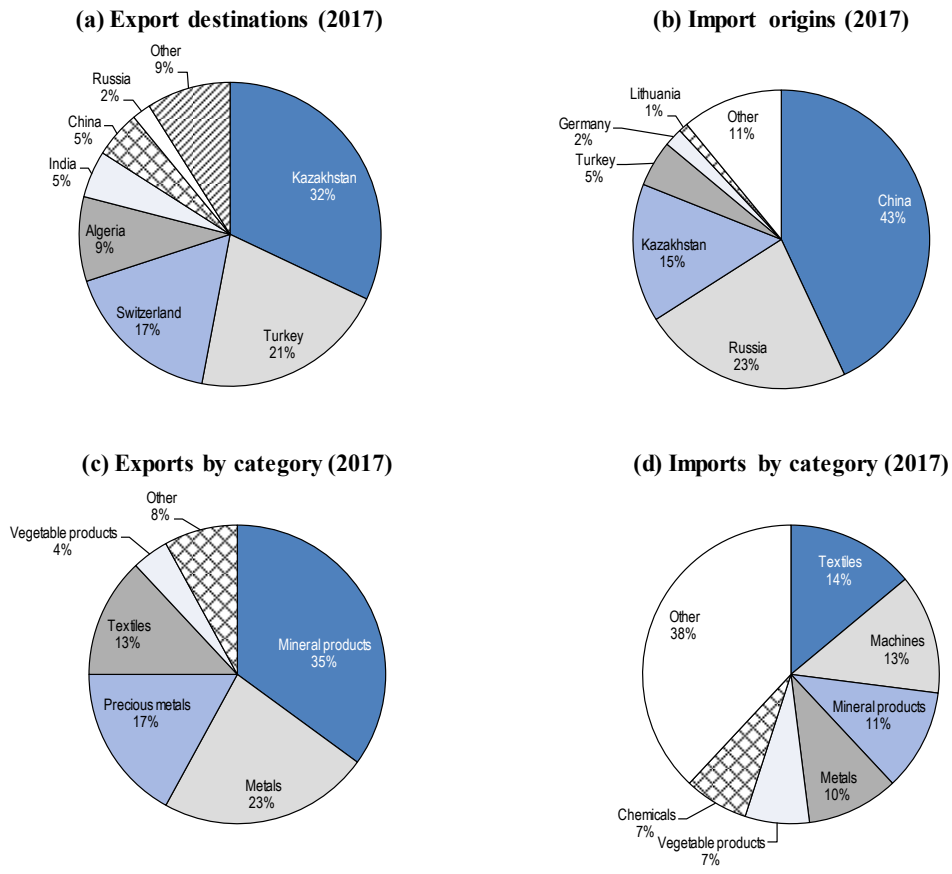
Trade

Tajikistan became a member of the World Trade Organisation in 2013. It is not a member of the Eurasian Economic Union.

Tajikistan's exports are primarily extractives and, to a lesser extent, cotton textiles (see Figure 7.1(c)). Mineral products (mostly zinc ore and lead ore) account for 35% of Tajikistan's exports by value, while metals and precious metals make up 23% and 17% respectively. Raw aluminium is Tajikistan's single most important export (18% of total export value), and gold is a close second (17%). Most of Tajikistan's exports classified as 'textiles' (13%) are raw or minimally refined cotton products, the two most important being raw cotton (6.7%) and non-retail pure cotton yarn (4.3%). Tajikistan's imports are more diverse but concentrated in consumer goods, specifically textiles and machines (see Figure 7.1(d)). Lacking the domestic oil and gas industry of some of its neighbours, Tajikistan relies on hydrocarbon imports to meet demand. Refined petroleum accounts for 6.2% of total imports by value.

Kazakhstan is one of Tajikistan's main trading partners: It is the destination of 32% of its exports and the origin of 15% of its imports (see Figure 7.1(a) and (b)). Chinese and Russian imports make up two thirds of Tajikistan's total imports (43% and 23% respectively), but exports to these countries are far more modest (5% and 2% respectively). Similarly, Turkey and Switzerland are important export destinations (21% and 17%), but feature less prominently in Tajikistan's imports (5% and 0.16%).

Figure 7.1. Trade of Tajikistan



Source: Observatory of Economic Complexity (2017[5]), *Tajikistan: Exports, Imports and Trade Partners*, Observatory of economic Complexity, https://atlas.media.mit.edu/en/profile/country/tjk/

Investment climate

While Tajikistan has a relatively well-developed regulatory framework for investment, the poor implementation of these regulations has led to an unpredictable and non-transparent regulatory environment for investors to operate. Currently, there is an open investment regime where all forms of investment are welcome. Steps have been taken to simplify business registration, improve licencing and taxation as well as competition laws (UNCTAD, 2016[6]). However, many of these reforms are not implemented on the ground due to a weak rule of law and judiciary system, as well as corruption and a lack of correct interpretation of these laws. For example, businesses are required to make irregular advance tax payments, and are often fined through retroactive tax audits (World Bank, 2018[7]). The informal sector is large, very few new businesses are registered and the domestic private sector plays only a limited role in the country's economy. According to the World Bank's 'Ease of Doing Business 2019', Tajikistan currently ranks 126th, comparing unfavourably with its neighbours such as the Kyrgyz Republic (70th) or Kazakhstan (28th).

At the institutional level, the government has put in place structures to deal with investment policy and to promote investments, but further capacity is needed for these institutions to be more effective. The responsible body for investment policies is the

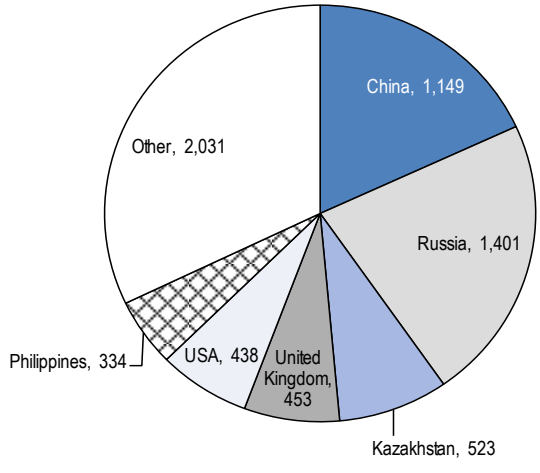
Committee on Investment and State Property Management, while TajInvest is the investment promotion agency in charge of the promotion agenda. The Ministry of Economic Development and Trade, which is in charge of the development of free economic zones, also designs policies to attract investments in these zones. At the Presidential level, a public-private dialogue mechanism in the form of a Consultative Council on Improvement of Investment Climate has been established since 2007 to promote reforms to improve the climate for investments and entrepreneurship. Many of these institutions however need further capacity building, including TajInvest, which is not fully equipped to carry out its investment promotion activities (UNCTAD, 2016[6]).

The People's Republic of China and the Russian Federation are the two most important sources of FDI in Tajikistan, accounting for 22% and 21% respectively (see Figure 7.2). Other important FDI sources include Kazakhstan (8%), the United Kingdom (7%), the United States (6%) and the Philippines (5%).

The approach Tajikistan has taken in regards to large-scale investments is resulting in a considerable risk of debt stress. Gross government debt amounted to a third of Tajikistan's GDP in 2015, then rose to 44.8% in 2016 and surpassed 50% of GDP in 2017. Over 80% of this debt is to a single creditor, China's Export-Import Bank, which is linked to the Belt and Road Initiative (BRI) (Hurley, Morris and Portelance, 2018[8]). With existing mechanisms, the government has accepted loans for large-scale projects (notably Dushanbe's Chinese-financed coal-fired power plant) that it was then unable to repay. Such defaults led to debt settlements that have included licenses for mineral deposit extraction (Emerging Markets Forum, 2019[9]) and even transfer of sovereignty over disputed territory to China (Hurley, Morris and Portelance, 2018[8]). Its debt levels are considered unsustainable and both the IMF and the World Bank assess Tajikistan as having a 'high risk' of debt distress (Hurley, Morris and Portelance, 2018[8]).

Figure 7.2. FDI in Tajikistan by source country, 2007-2015

USD million

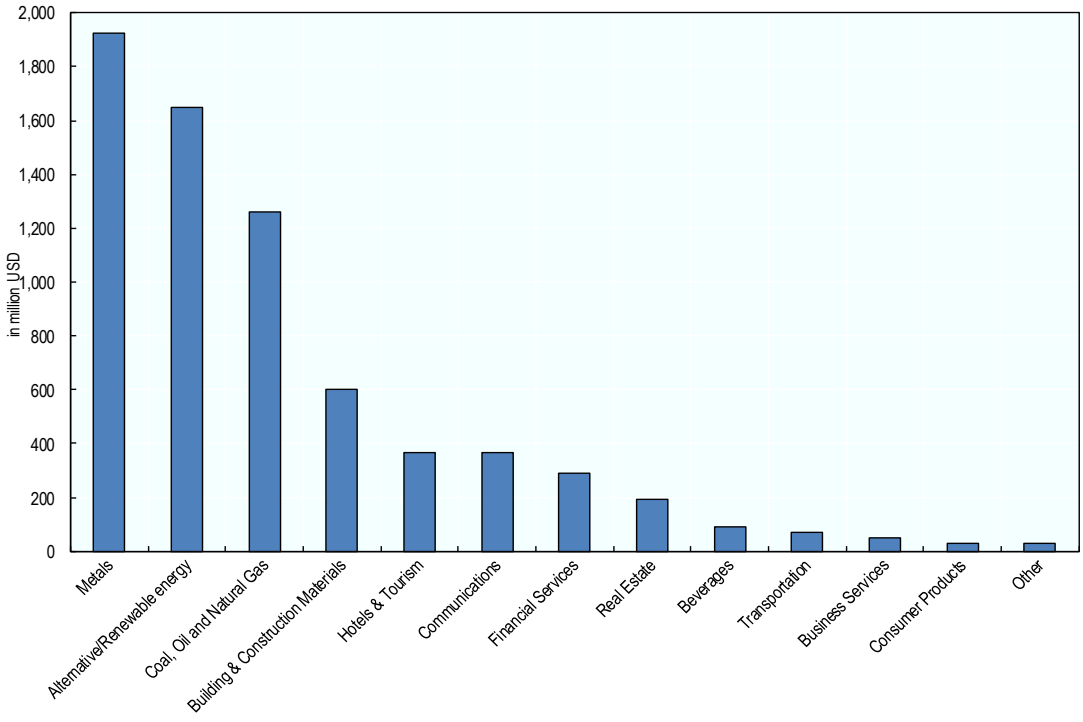


Source: Chamber of Commerce and Industry of the Republic of Tajikistan (n.d.[10]), *Аналитические данные о притоке иностранных инвестиций в экономику Республики Таджикистан в период 2007-2015 г. [Analytical data on foreign investment inflow into the economy of the Republic of Tajikistan for the period 2007-2015]*, Chamber of Commerce and Industry of the Republic of Tajikistan.

Tajikistan has been able to attract limited cross-border greenfield FDI projects totalling around USD 7 billion between 2003 and 2017, second-lowest in Central Asia after the Kyrgyz Republic's USD 6.3 billion and significantly lower than other regional peers. Foreign investors in Tajikistan have been mainly investing in metals projects (28%), alternative and renewable energy (24%), and coal, oil and natural gas (18%) (see Figure 7.3). Infrastructure related investments have been rather limited. For example, investments into construction materials reached USD 600 million (or 9%) while the transport sector received the least investments of only USD 70 million (or 1%) of the total announced greenfield FDI projects in Tajikistan. Recognising the important role of foreign investors to achieve sustainable growth, the *National Development Strategy 2016-2030* (see section 7.3 on the Tajikistan's key strategic documents) aims to attract as much as USD 55 billion in FDI by 2030. Such investments are aimed to increase the gross fixed capital formation to GDP by the private sector, which has averaged only 4.4% since 2000, which is much lower than the 21% average investment rate in the CIS countries (World Bank, 2018[7]).

Figure 7.3. Greenfield FDI in Tajikistan by economic activity, 2003-2017

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



Note: Other includes: Automotive OEM; Software & IT services; Textiles; Automotive Components; Minerals; Food & Tobacco.
Source: OECD based on fDi Markets (2019[11]), *fDi Markets: the in-depth crossborder investment monitor (database)*, fDi Markets, https://www.fdimarkets.com/

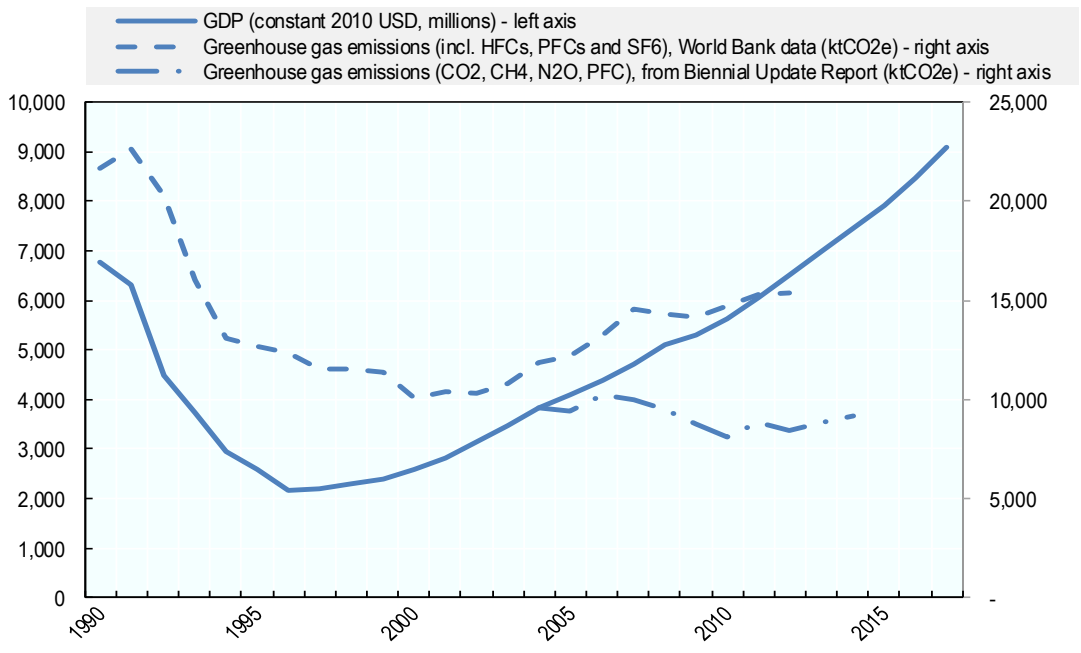
Climate change

Tajikistan is particularly vulnerable to the effects of climate change. From 1950 to the present day, Tajikistan has lost about 20% of its glacier cover, and current melt rates will lead to average losses of about 2 km^3 per year. Certain parts of the country (the south, western Pamir and the mountains of central Tajikistan) could face up to 5°C of warming by the end of the century, leading to increased incidence of heat waves and droughts. Altered precipitation patterns combined with rising temperatures pose major threats to Tajikistan's entire economy, particularly its sizeable agriculture sector, but also its future energy and food security as well as its water, transport and health systems (Government of the Republic of Tajikistan, 2014[12]).

Tajikistan's contribution to global greenhouse gas emissions is miniscule at 0.0003% (World Bank, 2019[1]), and its per capita GHG emissions are the lowest in the region at 1.9 tCO_2e per capita, having contracted since 1990 (4.1 tCO_2e per capita). Tajikistan's greenhouse gas (GHG) emissions intensity (emissions per unit of GDP) has also reduced from 3.2 kg of CO_2e per USD of GDP in 1990 to 2.4 $kgCO_2e$ by 2012. However, this is still considerably higher than the OECD average of 0.4 kg of CO_2e.

Tajikistan's greenhouse gas emissions dipped sharply immediately following independence and have only reached about three quarters of their pre-independence peak. Over the same period, the economy shrank over the 1990s to less than a third of its original size, then began steadily recovering in 1997 and surpassed its Soviet-era peak in 2013 (see Figure 7.4).

Figure 7.4. GHG emissions and GDP of Tajikistan, 1990-2017



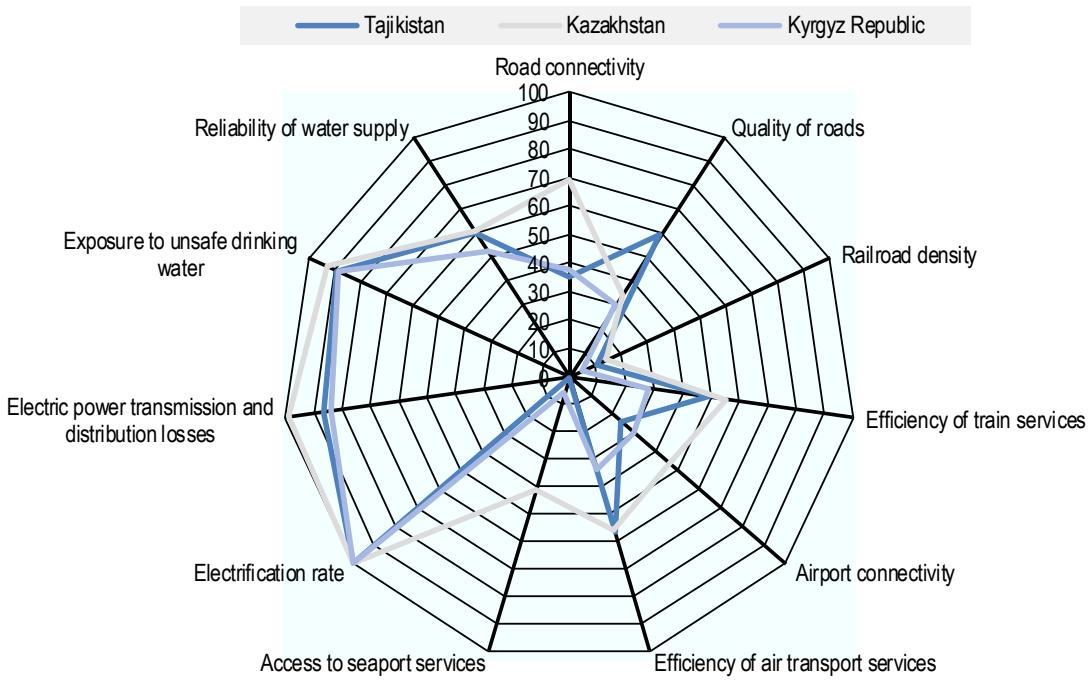
Source: World Bank (2019[1]), *World Development Indicators (database)*, World Bank, https://datacatalog.worldbank.org/dataset/world-development-indicators; Agency for Hydrometeorology under the Committee on Environmental Protection under the Government of the Republic of Tajikistan (2018[13]), *The First Biennial Report of the Republic of Tajikistan on Inventory of Greenhouse Gases under the UN Framework Convention on Climate Change*, Government of the Republic of Tajikistan, Dushanbe, https://unfccc.int/sites/default/files/resource/2doBURAnexoArgentina.pdf

In 1990, the sectoral breakdown of Tajikistan's emissions more closely resembled its neighbours': 67% of emissions came from the energy sector, while agriculture (20%), industry (10%) and waste (3%) accounted for the rest (Government of the Republic of Tajikistan, 2014[12]). By 2014, the agriculture sector's share grew to 50%, while energy's share had dropped to 28% (Government of the Republic of Tajikistan, 2014[12]).

7.2. Tajikistan's infrastructure needs and current plans

Tajikistan's infrastructure is substandard, despite gradual improvements (see Figure 7.5). Inadequate infrastructure, particularly in energy and transport, contributes to the high trade costs that restrict the country's access to nearby markets like that of China and Afghanistan. Deteriorating Soviet-era infrastructure such as irrigation channels, roads, dams, bridges and river embankments has increased the population's exposure to risks associated with extreme weather events and earthquakes (World Bank, 2018[7]).

Figure 7.5. Quality of infrastructure in Tajikistan



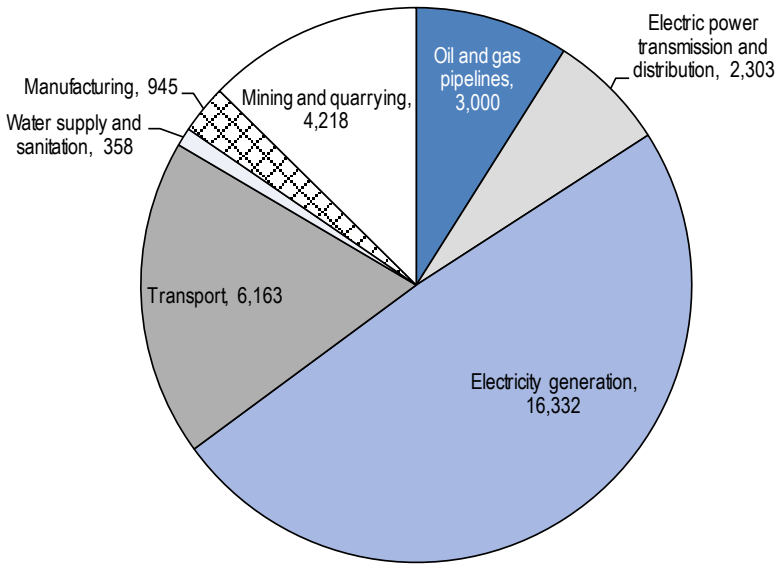
Source: World Economic Forum (2017[14]), *The Global Competitiveness Report 2017-2018*, World Economic Forum, http://www3.weforum.org/docs/GCR2017-2018/05FullReport/TheGlobalCompetitivenessReport2017%E2%80%932018.pdf.

Out of the USD 33.3 billion of under construction and planned investments tracked, energy projects account for over 58% (USD 21.6 billion) of projects while transport and mining and quarrying make up 18% and 13% respectively. Finally, manufacturing and water supply and sanitation only account for 3% (USD 945 million) and 1% (USD 358 million) respectively of planned and under construction investment projects. The energy

investments are divided into electricity generation projects (over 49% or USD 16.3 billion) and electric power transmission and distribution (7% or USD 2.3 billion) (see Figure 7.6). Such strong focus on hydroelectric power plants is in line with the government's objective to develop its capacity to sell excess power to neighbouring countries, particularly Afghanistan and Pakistan. One of the most significant sources of financing for large infrastructure projects such as transport and energy facilities, as well as power plants and power lines is China's BRI, which the government considers as a tool to finance its national development projects as part of the National Development Strategy until 2030.

Figure 7.6. Infrastructure projects in Tajikistan by sector

Planned and under construction in USD millon



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

Transport

Tajikistan ranks 147th out of 167 countries in the World Bank's Logistics Performance Index with a score of 2.29 (out of 5), the lowest in the region. Its infrastructure (2.17) and customs (2.02) are particularly weak (World Bank, 2018[15]).

Most of Tajikistan's cargo and passengers travel by road. 96% of freight turnover and 99% of overland passenger turnover in Tajikistan occurred by motorway in 2016. Motor transport accounted for 74.5% of total passenger turnover, while air transport made up the majority of the remaining passenger turnover (24.7%) (Agency for Statistics under the President of the Republic of Tajikistan, 2017[16]). Tajikistan's rail network, originally conceived as a part of the wider Soviet system, consists of two unconnected lines (one running from Tashkent to the Fergana valley through Tajikistan in the north, the other linking Dushanbe to southern Uzbekistan). This particularity explains in part the small modal share of rail in both freight and passenger transport (ITF, 2019[17]).

With no access to the sea, Tajikistan relies mainly on road transportation for its trade. Its road infrastructure capacity has to increase by 191% by 2030 and by 516% by 2050 to maintain network performance. Several international roads forming parts of CAREC corridors that pass through Tajikistan have been identified as requiring particular attention for capacity increases, such as the roads between Samarkand in Uzbekistan and Tajikistan's capital Dushanbe or between Tashkent and Khujand, a city in northern Tajikistan. In Tajikistan, 83% of the roads are unpaved because the traffic currently passing through them does not justify paving them, but projected increases to passenger and freight traffic may surpass the economic threshold to warrant paving (ITF, 2019[17]).

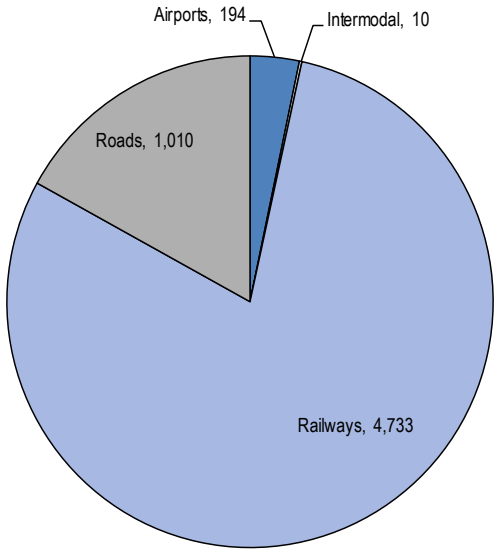
Lack of connectivity, both domestically and internationally, is a major barrier to Tajikistan's integration into regional and global value chains. Currently, all of Tajikistan's international rail links run through Uzbekistan, and tensions between Tajikistan and Uzbekistan have led to border closures in the past. To circumvent Uzbekistan and diversify its rail links, Tajikistan announced that it will build international rail links to Afghanistan as part of the Turkmenistan-Afghanistan-Tajikistan (TAT) railway, but improved relations with Uzbekistan seem to have reduced Tajikistan's appetite for the project (Putz, 2018[18]). Benchmarked against Germany, a global leader in transport and logistics, Tajikistan is only 53% as well connected, several percentage points below its neighbours. It costs about USD 245 for one tonne of goods to reach 20% of global GDP from Tajikistan, meanwhile in Germany the same access can be attained at a smaller cost of around USD 30 (ITF, 2019[17]).

Tajikistan's planned and current transport infrastructure projects account for around USD 5.9 billion, and consist primarily of railway projects (80% or around USD 4.7 billion) (see Figure 7.7). Although at a much lower level, investments in the road sector come second at around USD 1 billion (or 17%), followed by limited investments in airports (USD 194 million or 3%). Tajikistan has also been investing in logistics centres to increase the efficiency of transit transport in the country and the region but so far, very limited amounts have been allocated. The projects under construction are mainly brownfield investments that aim to upgrade sections of roads linking different economic centres in Tajikistan as well as connecting the country with neighbouring states (Table 7.2) such as for example the Dushanbe-Uzbekistan Border Road Improvement Project, which will connect Dushanbe to the Tajikistan-Uzbekistan border.

While projects under construction are mainly focusing on roads, the planned projects instead have a focus on railways. As shown in Table 7.2, these are mostly large-scale, often cross-border investments that aim to increase the connectivity of the country with neighbouring markets. This includes the construction of the Russia-Kazakhstan-Kyrgyz Republic-Tajikistan railway and the China-Kyrgyz Republic-Tajikistan-Afghanistan-Iran railways. Such investment on improving regional transport are considered to be the main sources of broad-based economic growth as they will increase the movement of goods, people and services in the region, and will allow Tajikistan to better include itself in regional and global value chains (TRACECA, n.d.[19]).

Figure 7.7. Transport projects in Tajikistan by sub-sector

Planned and under construction in USD million



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

Table 7.2. Hotspot projects in the transport sector in Tajikistan

(a) Under construction					
Name	Sub-sector	Description	Project value (USD million)	Funding source	Type of investment
Kulyab-Kalaikhumb Road Project (Sections A and F)	Road	The project will upgrade two sections of road linking the southwestern region of Khatlon with the eastern Gorno-Badakhshan Autonomous Region. Such a project will also increase trade with neighbouring countries.	116	ABUDF; IsDB; KFAED; SFD; Government of Tajikistan; OFID	Brownfield
Dushanbe-Uzbekistan Border Road Improvement Project	Road	The project will rehabilitate a 5 km road connecting Dushanbe to the border with Uzbekistan. It is considered as the last missing road of the Asian Highway Network and the CAREC Corridor 3, which is old and in poor condition.	106	EBRD; AIIB	Brownfield
(b) Planned					
Name	Sub-sector	Description	Project value (USD million)	Funding source	Type of investment
Karamika-Vahdat Section of Russia- Kazakhstan-Kyrgyz Republic-Tajikistan Railway	Railways	The project will have a total length of 1 181 km, including 296 km in the territory of Tajikistan from Karamik to Vakhdat. The railway link is expected to link Tajikistan to other countries and strengthen the movement of goods, services and people in the region. A preliminary feasibility study has already been completed in 2015 and the	2 500	Implementer of the project: SOE *Rohi ohani Tojikiston* (Tajik Railways)	Greenfield

		total expected construction period is ten years. The estimated cost of construction for the Tajikistan section is USD 2.5 billion.			
Karamyk - Vakhdat - Kurgan Tyube - Kalkhazabad - Nizhny Pyanj Railway Construction Section of China – Kyrgyz Republic-Tajikistan - Afghanistan-Iran Railway	Railways	The project is one of the planned new railway constructions that will link China with Iran crossing Tajikistan, Kyrgyz Republic and Afghanistan.	2 000	Bank of China, Kyrgyz Republic, Tajikistan, Afghanistan, Iran, World Bank, ADB; USA (unspecified)	Greenfield
Dushanbe-Osh-Kashgar Railway Construction Section of Railway section of China – Kyrgyzstan- Tajikistan - Afghanistan- Iran Railway	Railways	The project is one of the planned new railway constructions that will link China with Iran crossing Tajikistan, Kyrgyz Republic and Afghanistan.	1 900	MTC of Tajikistan	Greenfield
Reconstruction and rehabilitation Kalaikhum-Khorog-Murghab – Tokhtamysh road	Road	The project entails the reconstruction and rehabilitation of a 80 km section between Kalaihum and Vanj. It will significantly reduce travel time and the freight cost by 20%. A preliminary feasibility study was already conducted by the China Roads and Bridges construction Corporation in 2014.	239	MTC of Tajikistan	Brownfield
Construction of Danghara Airport	Airport	The project is part of the National Development Strategy to 2030 and the State Target Program on Development of Transport Complex until 2025 to promote infrastructure and strengthen material and technical upgrades.	138	OJSC Dhangara Airport	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. ABUDF = Abu Dhabi Fund for Development; ADB = Asian Development Bank; AIIB = Asian Infrastructure Investment Bank; EBRD = European Bank of Reconstruction and Development; IsDB = Islamic Development Bank; KFAED = Kuwait Fund for Arab Economic Development; MTC = Ministry of Transport and Communications (of Tajikistan); OFID = OPEC Fund for International Development; OJSC = open joint-stock company; SFD = Saudi Fund for Development

Source: OECD analysis based on available data from CAREC (2019[20]), CSIS (2019[21]), TAJinvest (n.d.[22]) and OFID (2019[23]) as of June 2019.

Energy

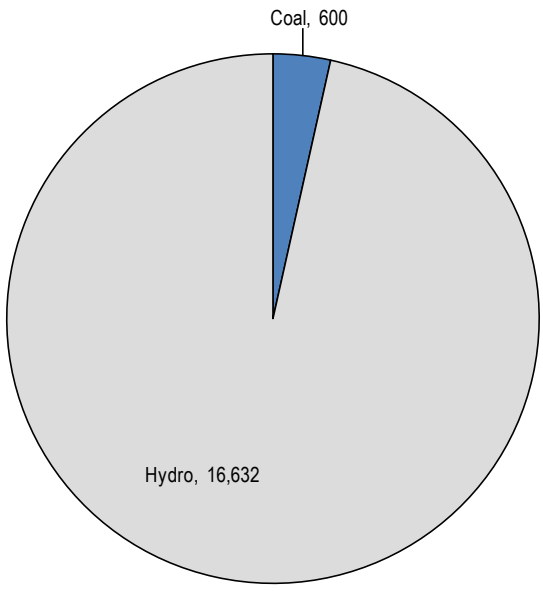
The overall quality of Tajikistan's energy infrastructure is poor. Although the country has achieved universal access to electricity, existing systems function inefficiently. The quality of transmission and distribution systems lead to losses of 17.1% (World Economic Forum, 2017[14]) and firms experience upwards of 6 power outages per month on average (World Bank, 2019[1]).

Tajikistan is a net importer of oil and natural gas, importing 0.97 Mt of oil in 2016 and 0.14 Mtoe of natural gas in 2010 (the last year of available data). Although historically an importer of electricity as well, it has begun exporting electricity (0.11 Mtoe in both 2015 and 2016). Given its connectivity shortcomings and dependence on imports of both oil and gas, Tajikistan faces major energy security concerns. The President has referred to 'energy independence' as one of the government's top priorities for the future development of Tajikistan (President of the Republic of Tajikistan, 2018[24]). In particular, Tajikistan aims to increase its electricity generation capacity to power industrial development (particularly energy-intensive aluminium production) and increase exports. It also aims to diversify its sources of electricity away from

hydroelectric dams, which currently generate 97% of the country's electricity (see Figure 7.8). Tajikistan's *National Development Strategy to 2030* names both renewables (wind, solar) and coal-fired power plants as possibilities for increased capacity.

Tajikistan's focus on coal derives from energy security concerns and considerable unexploited domestic reserves. The country's dependence on electricity generation from hydroelectric dams leads to seasonal electricity shortages in the winter, leaving an estimated 1 million people without a reliable supply of electricity (UNECE, 2017[25]). Given the availability of domestic coal deposits, Tajikistan has turned towards coal. Tajikistan mined 1.05 million tonnes of coal in 2015, and the *National Development Strategy* sets ambitious production targets for the future: 4.05-5.3 Mt by 2020, 6.9-10.3 Mt by 2025 and 10.4-15.1 Mt by 2030. Coal currently generates 3% of electricity, and, since the operating coal-power plants such as Dushanbe-2 are combined heat and power plants, it is a significant source of district heating. All of Tajikistan's coal-fired generation units came online in the past ten years, and further projects have been announced (End Coal, n.d.[26]).

Figure 7.8. Electricity generation by fuel (GWh, 2016)



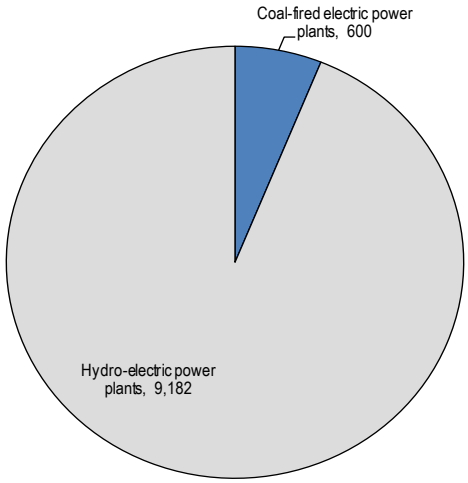
Source: IEA (2018[27]), *IEA World Energy Balances 2018*, International Energy Agency, https://webstore.iea.org/world-energy-balances-2018

Tajikistan's current and planned energy investments are in line with the government's strategies to increase the capacity of renewables for electricity generation. For instance, Figure 7.9 shows that 94% of electricity generation projects are in hydropower (or 9.2 GW), while coal-fired electric power plants only account for 6% of the total electricity generation projects. Tajikistan has the eighth highest hydropower potential in the world with some 220 terawatt-hours technically recoverable, however many plants require rehabilitation given that they were built during the Soviet era. Currently, hydropower potential is only exploited at 4-5%. Such projects would therefore help to address the winter crisis and reduce the imbalance of excess energy supply during the summer

months and the energy deficit during the winter. They would also contribute to the *National Development Strategy to 2030* to increase electricity generation from 17.1 billion kW/h in 2015 to 26.2 in 2020, and ultimately to 40.7-45 in 2030. Besides hydropower, there are no other renewables projects under construction or being planned, although other renewable energy sources do exist compromising 3% of Tajikistan's energy profile.

Figure 7.9. Electricity generation projects in Tajikistan, by fuel

in MW



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

A further analysis of the hotspot energy projects under construction and planned (see Table 7.3) also shows that most important projects are in hydropower, but there are also a number of large-scale regional projects where Tajikistan is a participant country. One of the most significant projects currently under construction is the Roghun Hydropower Plant, which is the main pillar of the *National Development Strategy of Tajikistan to 2030*. Construction of the 3 600 MW plant will cost almost USD 4 billion and is expected to be finished by 2032 when it will be commissioned. The project will contribute to the objectives of the strategy of poverty reduction and growth, by boosting exports of hydropower and reducing energy shortages in the country. At the same time, such construction also entails social and economic risks, which will have to be managed by the government in order to avoid instability (World Bank, 2018[7]).

At the regional level, Tajikistan is participating in oil and gas pipeline and electricity transmission projects. For example, Line D of the Central Asia-China gas pipeline is one of the largest natural-gas mega projects in the country that will cost around USD 3 billion, with major financing from China. Another significant project is the World Bank-funded Central Asia-South Asia Electricity Transmission and Trade Project (CASA-1000), which will help Tajikistan and the Kyrgyz Republic to export summer surplus electricity to neighbouring Kazakhstan, Uzbekistan, Afghanistan and Pakistan. When realised, the project is expected to integrate the electrical networks of Central and South Asia. Tajikistan is poised to benefit considerably from this project with increased electricity exports, spurring additional development in the country.

Table 7.3. Hotspot projects in the energy sector in Tajikistan

(a) Under construction						
Name	Sub-sector	Description	Project value (USD million)	Capacity (MW)	Funding source	Type of investment
Rogun Hydropower Dam Project	Hydro	The project is expected to boost hydropower exports and limit energy shortages, therefore contributing to growth and reduction of poverty across the country. The project is expected to be fully commissioned in 2032.	3 900	3 600	Salini Impregilo SpA and OJSC Rogun HPP	Greenfield
Line D of Central Asia-China gas pipeline (Tajikistan Section)	Oil and gas pipeline	The existing three lines of the pipeline run 1830 km from Turkmenistan to China through Uzbekistan and Kazakhstan. The fourth line, Line D, whose construction started in 2014 and is expected to be completed in 2020, will run 1 000 km from Turkmenistan to China via Uzbekistan, Tajikistan and the Kyrgyz Republic.	3 000	N/A	China (unspecified)	Greenfield
CASA-1000	Electric power transmission and distribution	CASA-100 is a regional project for the construction of a power transmission line between - Tajikistan, Afghanistan, Pakistan and the Kyrgyz Republic. The Tajikistan portion of CASA-1000 is a 170-km transmission line from north to south covering some 60 villages.	1 170	1 000	Governments of Kyrgyz Republic, Tajikistan (Ministry of Energy & Industry), Afghanistan, Pakistan	Greenfield
Nurek Hydropower Rehabilitatio n Project Phase I	Hydropower	The objectives of the First Phase of Nurek Hydropower Rehabilitation Project for Tajikistan are to rehabilitate and restore the generating capacity of three power generating units of Nurek hydropower plant, improve their efficiency, and strengthen the safety of the Nurek dam.	350	3 000	World Bank; AIIB; EDB; Other sources	Brownfield
Cross Regional Power Trade	Electric power transmission and distribution	The project aims to facilitate cross-border trade of electricity of summertime hydropower surplus in Kyrgyz Republic and Tajikistan. As part of the project, the high voltage transmission infrastructure will be constructed and reinforced.	301	N/A	EBRD; World Bank; EIB	Brownfield
(b) Planned						
Name	Sub-sector	Description	Project value (USD million)	Capacity (MW)	Funding source	Type of investment
Fon-Yagnob	Coal-fired power plant	The project is promoted by the Investment Promotion Agency of Tajikistan as one of the priority projects to ensure reliable electricity supply during the winter period.	600	600	N/A	Greenfield
Hostav HPS	Hydropower	The project, scheduled for completion in 2026, is a key part of the strategy to eliminate the winter energy deficit. It is expected that	2 309	1 200	N/A	Greenfield

		the project will create employment for 26 000 people annually.				
Shurob HPP	Hydropower	The project is 100 km east of the capital Dushanbe and is expected to produce 3.2 billion kWh per year.	1 500	850	N/A	Greenfield
Shtiyon HPP	Hydropower	The project is a priority project to tackle Tajikistan's winter crisis deficit. The project has been selected based on certain criteria such as ensuring energy adequacy, socio-economic gains, and reduction of water spillages.	1 500	160	N/A	Greenfield
Anderob Power Plant	Hydropower	The project aims to overcome the current electricity shortages in Tajikistan and meet the growing electricity demand in Tajikistan. It will contribute towards achieving the SDG 7 to address electricity shortages and the SDG 8 by creating employment for around 16 000 people.	1 300	650	N/A	Greenfield

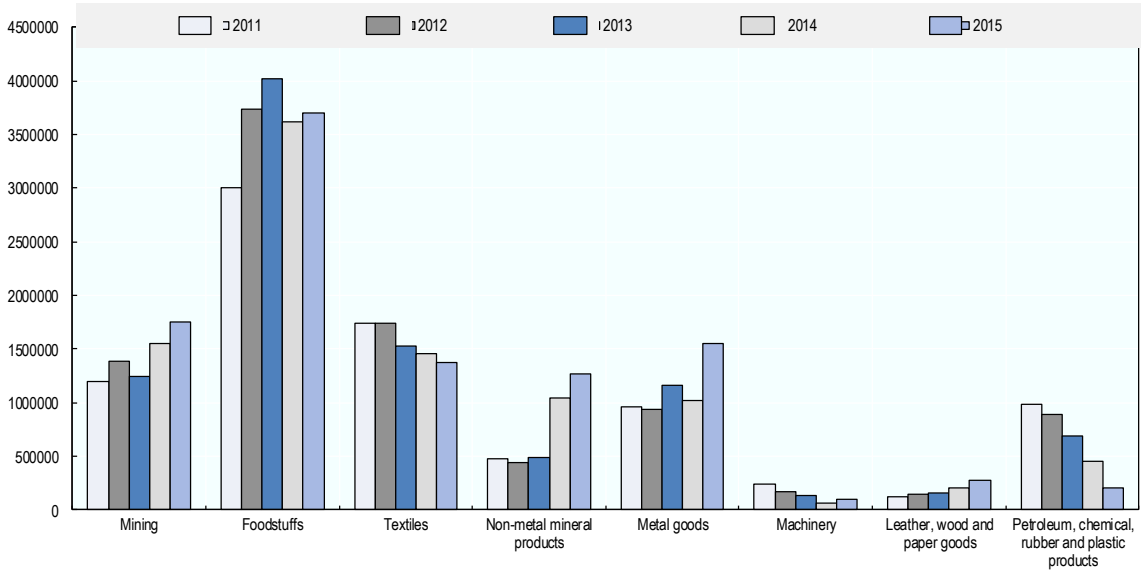
Note: Refer to the Preamble for the present report's definition of 'hotspot' and other information on how the projects above were selected and prioritised. AIIB = Asian Infrastructure Investment Bank; EBRD = European Bank of Reconstruction and Development; EDB = Eurasian Development Bank; EIB = European Investment BankOJSC = open joint-stock company
Source: OECD analysis based on accessed data from ADB (2019[28]), CAREC (2019[20]), CSIS (2019[21]), Dealogic (2019[29]), EBRD (n.d.[30]), IJGlobal (2019[31]), TAJinvest (n.d.[22]), World Bank (2019[32]) as of June 2019.

Industry and mining

The National Development Strategy for the period up to 2030 aims to increase the share of industry in Tajikistan's GDP from 12.3% in 2015 to 12.5-13.5% by 2020, 16-16.5% by 2025 and 20-21% by 2030. It also aims to decrease the role of extractives in favour of production further up value chains. Extractives have, however, played a large and increasing role in Tajikistan's recent industrial output, while light industry (textiles) has declined and machinery's already small share has shrunk (see Figure 7.10).

Figure 7.10. Mining and industrial production of Tajikistan, 2011-2015

In thousand TJS (Tajik somoni 1998 prices)



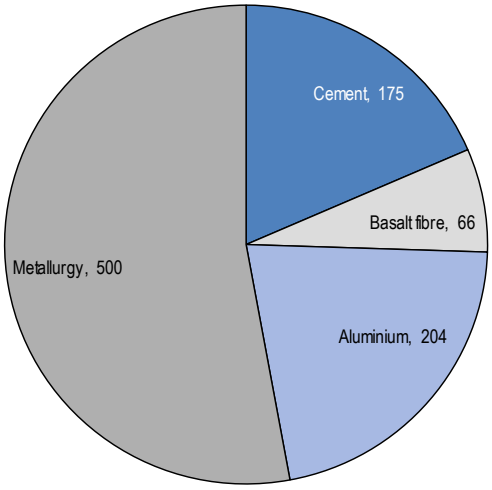
Source: Agency for Statistics under the President of the republic of Tajikistan (2018[33]), Выпуск промышленной продукции в разбивке по отраслям в постоянных ценах, 1980-2017 [Output of industrial production broken down by sub-sector in constant prices, 1980-2017], Agency for Statistics under the President of the republic of Tajikistan, https://www.stat.tj/ru/tables-real-sector

Tajikistan's planned and under construction manufacturing projects are mainly focusing on the metallurgical plants (53%) out of a total of USD 944 million, followed by aluminium plants (22% or USD 204 million), cement manufacturing (19% or USD 175 million) and basalt fiber production (7% or USD 65.8). Such projects reflect Tajikistan's leading position in the Central Asian smelting industry, and are in line with the government's priority to develop heavy industry (World Bank, 2018[7]). Progress in other industries however, is rather limited reflecting Tajikistan's narrow economic base and limited progress towards diversification.

A closer analysis of planned and under construction projects also demonstrate Tajikistan's reliance on heavy industries and the mining sector (Table 7.4). Such projects have been mainly promoted by Tajikistan's Investment Promotion Agency as priority investments. One of the largest projects currently under construction is the Istiqlol Metallurgical Plant, the construction of which started in 2014 and which is expected to produce 50 000 tons of lead and 50 000 tons of zinc per year. Upon commissioning, the project would create over 2 500 jobs, with domestic workers constituting 90% of the labour.

Figure 7.11. Industry and mining projects in Tajikistan by sub-sector

Planned and under construction in USD million



Source: OECD based on ADB (2019[28]), IJGlobal (2019[31]) and TAJinvest (n.d.[22]) as of June 2019.

Table 7.4. Hotspot projects in the industry and mining sectors in Tajikistan

(a) Under construction					
Name	Sub-sector	Description	Project value (USD million)	Funding source	Type of investment
Istiqlol Metallurgical Plant	Fabricated metal products	Production started in 2014 and it will produce 50 000 tonnes of lead and 50 000 tons of zinc per year. It is expected that once the project will be commissioned, it will create 2 500 new jobs for Tajik nationals.	500	ADB	Greenfield
(b) Planned					
Name	Sub-sector	Description	Project value (USD million)	Funding source	Type of investment
Mining of Silver at the Koni Mansuri Kalon Deposit	Mining of silver	The project is for the development of a silver deposit containing 1 Mt of ore. It aims to boost the country's export potential and create new jobs.	4 000	SOE	Greenfield
Talco Energy-Metallurgical Company (Talco)	Basic metals	The project aims to increase aluminium production up to 200 000 tonnes per year and reduce aluminium cost price.	204	Tajik Aluminum Company (TALCO)	Greenfield

Talco Gold Konchoch deposit project	Mining of gold	The project entails mining, extraction and processing of ore, and further production of gold, silver and antimony products. The expected duration of the project implementation is between two to three years.	200	The project is expected to be financed by private capital	Greenfield
Construction of a cement plant	Cement	The project entails the production of high-quality cement to be sold in the domestic market. The estimated payback period of the project is between four to five years and is expected to create between 60-70 jobs.	175	The project is expected to be financed by private capital	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
Source: OECD analysis based on accessed data from ADB (2019[28]) and TAJinvest (n.d.[22]) as of June 2019.

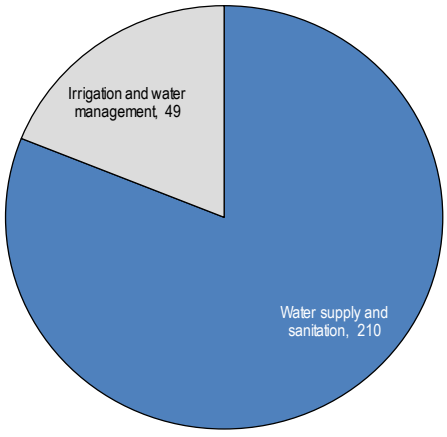
Water

Tajikistan has abundant water resources, where the largest rivers of Central Asia originate, providing over 70% of all drinking water resources of the region. The use of transboundary rivers by the countries in the region makes them economically dependent on water. This has often led to low-level frictions between Tajikistan, Uzbekistan and the Kyrgyz Republic over water access and pasturage in the Fergana. Despite the abundant water resources, Tajikistan uses only 20% of the available water potential (The State Committee on Investment and State Property Management of the Republic of Tajikistan, 2018[34]) and only three out of four people have access to a clean water source (World Bank, 2018[7]). Moreover, the irrigation infrastructure is also largely deficient. For instance, some 50% of the water distribution system and approximately 65% of the drainage system is considered dysfunctional (European Commission, 2014[35]).

Current and planned water projects amount for around USD 258 million, and they are mostly focused on water supply and irrigation (81% or USD 210 million) and irrigation and water management (19% or USD 49) (see Figure 7.12). Relevant investments include projects to build climate resilience such as climate proofing flood and mudflow protection infrastructure, as well as irrigation and drainage infrastructure. For example, the Zarafshon Irrigation Rehabilitation and Management Improvement Project financed by the World Bank aims to improve the management of water resources and irrigation in the northern part of the country. Such a project is expected to boost crop yields and increase food security for the local inhabitants.

Figure 7.12. Water projects in Tajikistan by sub-sector

Planned and under construction in USD million



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

7.3. 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

Tajikistan has two main long-term development strategies, the *National Development Strategy for the period to 2030* and the *Sustainable Development Transition Concept* (2007-2030) (see Table 7.5 and Table 7.6). Tajikistan could benefit from an overarching strategy defining the country's development objectives to 2050 in the context of the Paris Agreement, which Tajikistan ratified in 2017. A mid-century strategy, against which shorter-term documents would benchmark their own objectives, could help Tajikistan avoid costly lock-in to unsustainable development pathways, such as the recent pivot towards coal-fired power plants to diversify its electricity generation capacity. A longer-term vision could help the government weigh the costs and benefits of policy decisions and infrastructure development options.

The *Law on State Forecasts, Concepts, Strategies and Programmes of Socioeconomic Development* (2003) defines a hierarchy of documents from long-term "concepts" of socioeconomic development (15 years, adjusted every 5), strategies (10 years, adjusted halfway) and programmes (3-5 years) (UNECE, 2017[25]).

In practice, however, the terms 'concept', 'strategy' and 'programme' seem to be applied somewhat more arbitrarily with variable timeframes. The *Sustainable Development Transition Concept* (2007-2030), for instance, covers a 24-year period, while the 2016 *National Development Strategy for the period until 2030* covers 15 years. Programme are particularly variable: the *State Environmental Programme* (2009-2019) lasts half as long as the *State Programme for Research and Conservation of Glaciers* (2010-2030).

A well-defined hierarchy, from long-term documents (concepts and strategies) cascading through to medium-term and near-term documents (programmes and plans), allows lower-level documents to link their goals with longer-term objectives. In Tajikistan's existing strategic documents, these links appear to be absent, for example, the *National Development Strategy to 2030* does not refer to *the Sustainable Development Transition Concept*, despite a number of overlapping goals.

Although not yet approved by the government, the National Climate Change Adaptation Strategy to 2030 has been drafted and is already acting as the basis for climate-related measures in Tajikistan.

Institutional set-up and decision-making processes

Tajikistan lacks a dedicated environment ministry. The Committee on Environmental Protection, which is not an integral part of the government but rather a body subordinate to it, is responsible for most environment-related policy areas. As a result, the Committee lacks the authority to influence in coordination bodies and consultations on policies and strategies with environmental impacts, as evidenced by the poor integration of environmental concerns in sectoral documents (UNECE, 2017[25]).

The National Development Strategy identifies poor coordination across government bodies as a barrier to policy implementation. Previous efforts to address coordination concerns led to the creation of the National Development Council under the President in 2007 to facilitate communication and cooperation across the government (Ministry of Justice of the Republic of Tajikistan, 2007[36]). Overall, horizontal coordination mechanisms are relatively strong in Tajikistan, but relevant coordination bodies regularly exclude the Committee on Environmental Protection. The bodies charged with policy coordination on areas as diverse as public health and investment climate improvement do not include a representative of the Committee (UNECE, 2017[25]).

The *Programme for Medium-Term Development* (2016-2020) tasks the Presidential Administration and the finance and economy ministries with improving coordination across ministerial portfolios to better deliver policy coherence, and USD 2 million was earmarked for the task. During this review of coordination mechanisms, the government should reconsider the status of the Committee on Environmental Protection and its voice in coordinating bodies.

Tajikistan also lacks a system of intermediate and final evaluation of investment projects (Emerging Markets Forum, 2019[9]). Improved mechanisms for screening investment projects against national development and environmental goals could help Tajikistan more selectively harness foreign investment when the projects are in the country's best interest. Given the number of large-scale infrastructure projects in Tajikistan and the state of public finances, its debt situation could worsen if not managed appropriately. By articulating the government's long-term development and climate goals more clearly and consistently in a mid-century development strategy, Tajikistan would be better equipped to weigh the costs and benefits of large-scale infrastructure development projects.

List of relevant strategic documents

Table 7.5. Main strategic documents in force

	Status	Time Horizon	Sectoral Coverage	Main objectives
First Nationally Determined Contribution (NDC)	Submitted in 2017	2017-2030	Economy-wide	• Unconditional target: not exceed 80-90% of the 1990 level of greenhouse gas emissions by 2030, 1.7-2.2 tons in CO_2e per capita • Conditional target: target of 65-75% of the 1990 level of greenhouse gas emissions by 2030, 1.2-1.7 tons in CO_2e per capita • Main sectors targeted for emission reduction: Water (linked with improvement in irrigation, water resource management and protection of glaciers), Industry (introduction of new technologies), Transport (development of low-emission transport infrastructure), Energy (transition to renewable energy sources) • Main adaptation tool: the list of strategic documents mentioned below
National Development Strategy for the period until 2030	Adopted in 2016	2016-2030	Governance, planning, transport, energy, water, industry	• Industrial development through the implementation of infrastructure projects and promoting the rational use of land, water and energy resources, as well as an aim to increase production capacities • Develop an effective public administration system • Human capital development, focusing on improving levels of education, science, health, social protection, living environment and social equality • Improve the investment climate and promote growth in the financial sector • Increase access to water supply systems and sanitation • Increase electricity generation, aiming to reach 26.2 billion kWh by 2020, 37.5-37.6 billion kWh by 2025 and 40.7-45 billion kWh by 2030 • Improve connectivity, especially to neighbouring countries and key markets, by developing transport and telecommunications
State Environmental Programme for the period 2009-2019	Adopted in 2009	2009-2019	Governance, energy, water, industry	• Promote the efficient and rational use of natural resources • Ensure environmentally safe processes in production • Introduce and use environmentally friendly technologies • Increase the level of responsibility of government bodies and society • Create institutions and organisations that support an environmental mind-set to development • Produce reports on the state of the environment in various sectors, to promote environmentally friendly practices

Programme on Improving Access of the Population to Clean Drinking Water for the period 2008-2020	Adopted in 2006	2008-2020	Water	• Rehabilitate existing water systems and construct new centralised water supply systems with the use of modern technology • Construct local water supply systems (e.g. water wells) • Introduce modern methods of water disinfection • Promote a more efficient use of water resources
Programme of Water Sector Reform for the period 2016-2025	Adopted in 2015	2016-2025	Water	• Enable the implementation of integrated water resource management • Institutional reforms in the water sector to promote transparency and create accountable structures • Transition from administrative-territorial water resource management to management within hydrological and hydrographic zones
Programme for Mid-Term Development of the Republic of Tajikistan for 2016-2020	Adopted in 2016	2016-2020	Governance, planning, finance	• Create a functional strategic planning system and increase coordination within the government • Improve the business environment and investment climate
Programme for the Adoption of Renewable Sources of Energy and the Construction of Small Hydroelectric Plants for 2016-2020	Adopted in 2016	2016-2020	Energy, Water	• Increase electricity supply, especially to remote highland areas • Construct small hydroelectric plants and create the conditions necessary for operational maintenance of existing small hydroelectric power plants
Targeted Government Programme of transport Development in the Republic of Tajikistan to 2025	Adopted in 2011	2011-2025	Transport	• Develop a set of measures that promote the consistent development of transport infrastructure in an economically sustainable manner • Create a national transport network, in compliance with established safety standards, to meet domestic needs • Promote free competition in domestic and international transport service markets
Concept of State Policy for Attraction and Protection of Investment of the Republic of Tajikistan	Adopted in 2012	No defined timeframe	Governance, Industry	• Increase investment in infrastructure projects • Modernise production processes by updating their material and technical base • Improve the effectiveness of the regulatory policy of the state within the investment sphere
Concept of Transition to Sustainable Development	Adopted in 2007	2007-2022	Governance, planning, transport, energy, water, industry	• Establish an effective form of governance • Ensure energy security, as well as social security • Promote environmentally sustainable production
Concept of Environmental Protection in the Republic of Tajikistan	Adopted in 2008	No defined timeframe	Governance, energy, water, industry	• Promote environmentally friendly practices across all economic sectors • Develop an environmental monitoring system • Protect and promote the rational use of land and water resources • Improve the welfare of the population

Table 7.6. Other relevant documents

	Status	Time Horizon	Sectoral Coverage
Environmental Monitoring Programme for the period 2013-2017	Adopted in 2012	2013-2017	Multi-sector
Mid-Term Plan for the Implementation of the Concept on Environment Protection for the period 2010-2012	Adopted in 2010	2010-2012	Multi-sector
Strategy for Improving the Welfare of the Population of Tajikistan for 2013-2015	Adopted in 2012	2013-2015	Multi-sector
Programme of State Foreign Borrowing of the Republic of Tajikistan for 2013-2015	Adopted in 2012	2013-2015	Multi-sector
State Quality Programme for 2013-2015	Adopted in 2012	2013-2015	Energy
Programme for Effective Use of Hydroelectric Resources and Energy Efficiency for 2012-2016	Adopted in 2011	2012-2016	Energy
Targeted Comprehensive Programme for the Use of Renewable Energy Sources in Tajikistan for 2007-2015	Adopted in 2007	2007-2015	Energy
Programme of Effective Use of Water and Energy Resources for 2012-2016	Adopted in 2011	2012-2016	Energy, Water
Programme for the Processing and Production of Finished Products from Raw Aluminium for 2007-2015	Adopted in 2007	2007-2015	Industry
Programme for Integrating Scientific and Technical Advances in Industrial Production for 2010-2015	Adopted in 2009	2010-2015	Industry
Programme of Light Industry Development for 2006-2015	Adopted in 2005	2006-2015	Industry

Notes

[i] The World Bank classified Tajikistan as a lower-middle income country from 2014 to 2016, but it was reclassified as a low-income country in 2017.

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Chapter 8. Investment in sustainable infrastructure in Turkmenistan

This chapter describes sustainable infrastructure planning in Turkmenistan and presents current trends in investment in large-scale infrastructure projects. It compares Turkmenistan's infrastructure plans in the energy, transport, industry and water sectors against its international commitments under the Paris Agreement on climate change and the Sustainable Development Goals (SDGs). The chapter also explores Turkmenistan's strategic documents for long-term economic development, sectoral development and the environment, including those related to climate change mitigation and adaptation. It identifies misalignments between stated goals and observed investment flows and provides recommendations to improve strategic planning for sustainable infrastructure.

Overview

Turkmenistan is an upper-middle income country with the second highest GDP per capita in Central Asia. 91% of Turkmenistan's export are mineral products (primarily gas), and 83% of its exports go to the People's Republic of China. Turkmenistan has one of the most difficult business environments in the region due to pervasive state control, exchange rate restrictions, heavy regulations, weak rule of law and persistently elevated corruption levels. Such issues are further exacerbated by limited property rights, lack of private land and a weak judicial system. Despite this, Turkmenistan benefits from large FDI flows, mainly Chinese investments in the oil and gas sector. While its contribution to global GHG is limited, Turkmenistan has one of the most energy-intensive economy due to natural gas seepage from oil and gas exploration, and very high energy subsidies leading to free access to energy in the country.

Despite some large-scale transport projects constructed in the past few years - Turkmenbashi International Sea Port on the Caspian Sea and a railway between Kazakhstan and Iran, Turkmenistan's infrastructure remains weak and logistic costs very high. Energy projects account for 66% of current infrastructure investments, mainly pipelines and cross-border electricity transmission projects. There is no sign that the country is beginning to diversify its electricity generation mix, which relies entirely on natural gas, and investments in transmission and distribution systems have been insufficient to limit leakages. , More transport investments are also needed to reap the economic benefits of its position near major markets in Iran, South Asia and, across the Caspian Sea, the Russian Federation.

Turkmenistan has adopted several strategic documents, such as the *National Socioeconomic Development Programme for 2011-2030* and the *National Climate Change Strategy.* However, its strategic documents may not be as actionable as they could be, since they do not specify which state body takes ultimate responsibility for the delivery of goals, and there are no quantitative – or at least verifiable – goals against which to measure progress on implementation. National legislation has included provisions for environmental impact assessments (EIAs) since 2000 but, in practice, EIAs are regularly carried out without public participation and consultation. In early 2019, Turkmenistan adopted a new institutional set-up to improve the implementation of reforms on transport, communication and industry. This could improve the integrated planning of the country's transport infrastructure, even though the merger between the State Committee on Environmental Protection (formerly an independent ministry) with the Ministry of Agriculture and Water Economy could weaken government's ability to mainstream environment in decision-making.

8.1. State of play: economy, investment and climate change in Turkmenistan

Economy and trade

Table 8.1. Key indicators on Turkmenistan's economy

Population (2018)	5 850 908
Urbanisation rate (2018)	52%
Annual population growth (2018)	1.6%
Surface area	488 100 km^2
GDP (USD, current price, 2018)	40 761 million
GDP per capita (USD, current price, 2018)	6 967
Real GDP growth (year-on-year change, 2019)	6.3%
Inflation (average consumer price, y-o-y change, 2017)	N/A
Exports of goods and services (% of GDP, 2018)	22.7%
Imports of goods and services (% of GDP, 2018)	12.5%
FDI, net inflows (% of GDP, 2017)	6.1%
General government net lending/borrowing (% of GDP, 2019)	0%
Unemployment (% of total labour force, 2018)	3.8%
Remittances (% of GDP, 2018)	0.004%
Transparency, accountability and corruption in the public sector rating (1= most corrupt, 6 = least corrupt, 2017)	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

Turkmenistan is an upper-middle income country with the second highest GDP per capita in Central Asia. More than half of Turkmenistan's population live in urban areas, and a quarter of the population live in the capital, Ashgabat. Turkmenistan's GDP contracted from USD 3.2 billion in 1991 to USD 2.4 billion in 1996. Starting in 1999, Turkmenistan's economy rapidly expanded and, by 2018, it was more than 12 times as large as in 1991. Over the same period, the country's population steadily increased, from 3.8 million in 1991 to 5.85 million in 2018 (World Bank, 2019[1]).

Industry, including construction, accounts for the largest portion of Turkmenistan's economy at 57%, the highest share in the region. The service sector makes up a further 28.1%, while agriculture accounts for 9.3% (World Bank, 2019[1]).

Trade

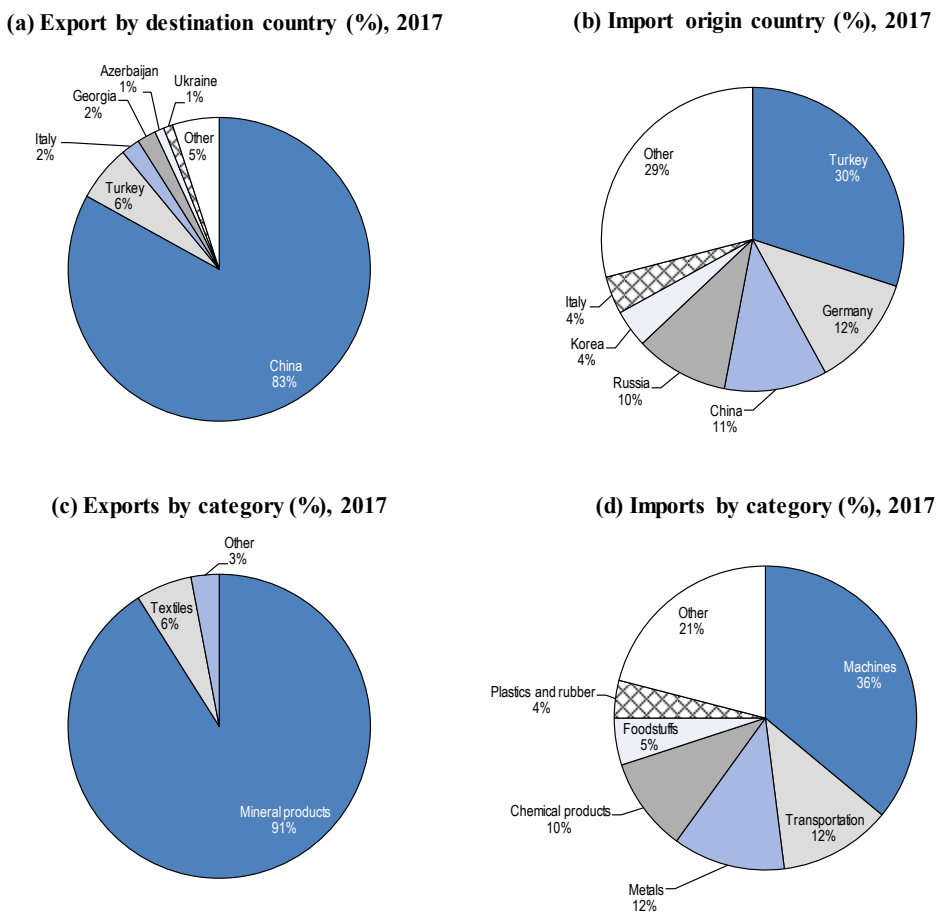
Turkmenistan is not a member of the World Trade Organisation and, unlike fellow regional non-members Azerbaijan and Uzbekistan, it is not an observer to the organisation. Turkmenistan is not a member of the Eurasian Economic Union either.

Petroleum gas alone accounts for 83% of Turkmenistan's exports, and its next largest export (refined petroleum, 5.6%) also falls into the mineral products category that dominates Turkmenistan's export mix (see Figure 8.1(c)). Textiles make up a further 6%, and the two main export products in this category are non-retail pure cotton yarn

(2.2%) and raw cotton (2.1%). All other categories of exports combined amount to just 3% of the country's total. Turkmenistan primarily imports manufactured goods, such as machines (36%), means of transportation (12%), metal products (12%, e.g. iron structures, iron pipes) and chemical products (10%, e.g. packaged medicaments, pesticides) (see Figure 8.1(d)).

The vast majority of Turkmenistan's exports go to the People's Republic of China (83%), and its second-largest export destination, Turkey, receives only 6% of exports (see Figure 8.1(a)). More than half of Turkmenistan's natural gas exports pass through the three existing pipes of the Turkmenistan-China pipeline to Xianjiang in China, and a planned additional pipe will increase capacity to 74-80 billion m^3 (Vakulchuk and Overland, 2018[3]). By contrast, only a fraction of Turkmenistan's exports go to its Central Asian and Caucasian neighbours (Georgia, 2%; Azerbaijan and Kazakhstan, about 1% each). Turkmenistan's imports come mainly from Turkey (30%), the European Union (Germany, 12%; Italy, 4%; France and the Netherlands, 2% each), China (11%) and the Russian Federation (10%) (see Figure 8.1(b)). The government plans to increase trade flows to USD 84 billion of exports and USD 51 billion of imports by 2025 (Big Asia, 2019[4]).

Figure 8.1. Trade of Turkmenistan



Source: Observatory of Economic Complexity (2017[5]), *Turkmenistan: Exports, Imports and Trade Partners*, Observatory of Economic Complexity, https://atlas.media.mit.edu/en/profile/country/tkm/

Investment climate

Turkmenistan has one of the most difficult business environments in the region due to a complex regulatory framework and unfavourable business practices. The country is not included in the World Bank Doing Business survey due to a lack of data, but the Heritage Foundation's *de jure* measure on the openness to foreign investment[i] reveals that FDI and other cross-border investment restrictions in Turkmenistan are among the highest in Central Asia. The country ranked 164th worldwide in terms of economic freedom in 2019 and received a score of 10 out of 100 on the investment freedom measure of the Index, similar to Uzbekistan (ranked 140th worldwide). The overall restrictions are driven by a number of factors, including heavy state control, restrictions on the exchange rates, heavily restrictive regulations, weak rule of law and persistently elevated corruption levels (Economist Intelligence Unit, 2019[6]). Such issues are further exacerbated by limited property rights, lack of private land, and a weak judicial system which is subordinate to the President.

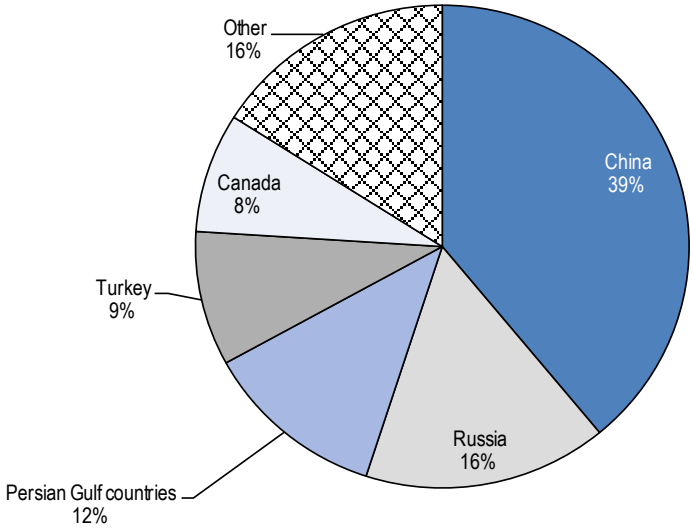
Investments in Turkmenistan are regulated by the Law on Foreign Investment (amended in 2008), the Law on Investments (amended in 1993), and the Law on Joint Stock Societies (1999). While such laws have been adopted to transform the economy, little has been achieved. Further reforms are needed to improve the investment climate, including the ease of restrictions on entry, exit and operations of enterprises (EBRD, 2014[7]), as well as reforming the administrative measures, reducing non-tariff barriers and subsidies (World Bank, 2015[8]). Currently, there exists no one-stop shop to facilitate the registration of businesses and the government has no investment promotion agency.

Turkmenistan benefits from large FDI inflows, especially for a country of its moderate size (US Department of State, 2018[9]). In 2012, it ranked 9th worldwide in the UNCTAD FDI Attraction Index, which compares countries by the FDI, in absolute terms, that they receive compared relatively to the size of the economy (EBRD, 2014[7]). Turkmenistan's national statistics committee has not published information on foreign direct investment, but international analysts estimate that the country's largest foreign investor is China (UNESCAP, 2016[10]) and most investments benefit the oil and gas sector (US Department of State, 2019[11]). In 2012, China was the largest source of FDI to Turkmenistan (39%), followed by Russia (16%), the Persian Gulf countries (12%), Turkey (9%) and Canada (8%) (see Figure 8.2).

Turkmenistan's total gross external debt as a fraction of GDP has risen from 23.1% in 2016 to 25.9% in 2018 and is projected to reach 27.7% by 2020 (IMF, 2019[12]). Compared to other regional hydrocarbon exporters, Turkmenistan's debt levels remain quite low.

The development of market conditions and the expansion of the private sector are key components of the second phase (2016-2020) of Turkmenistan's *National Programme of Socio-economic Development of Turkmenistan for 2011-2030* (for more information on Turkmenistan's strategic documents, see section 3). By the third phase (2021-2030), Turkmenistan aims to be among the world's highly developed countries and have achieved full integration into the global economy (Ovlyakulieva, 2012[13]). In the transport sector, the government aims to transform many state-owned enterprises into private companies, while tariffs and policy measures will be set by the Ministry of Industry and Communications, which formed in early 2019 through the merger of four ministries (State News Agency of Turkmenistan, 2019[14]).

Figure 8.2. FDI in Turkmenistan by source country, 2012

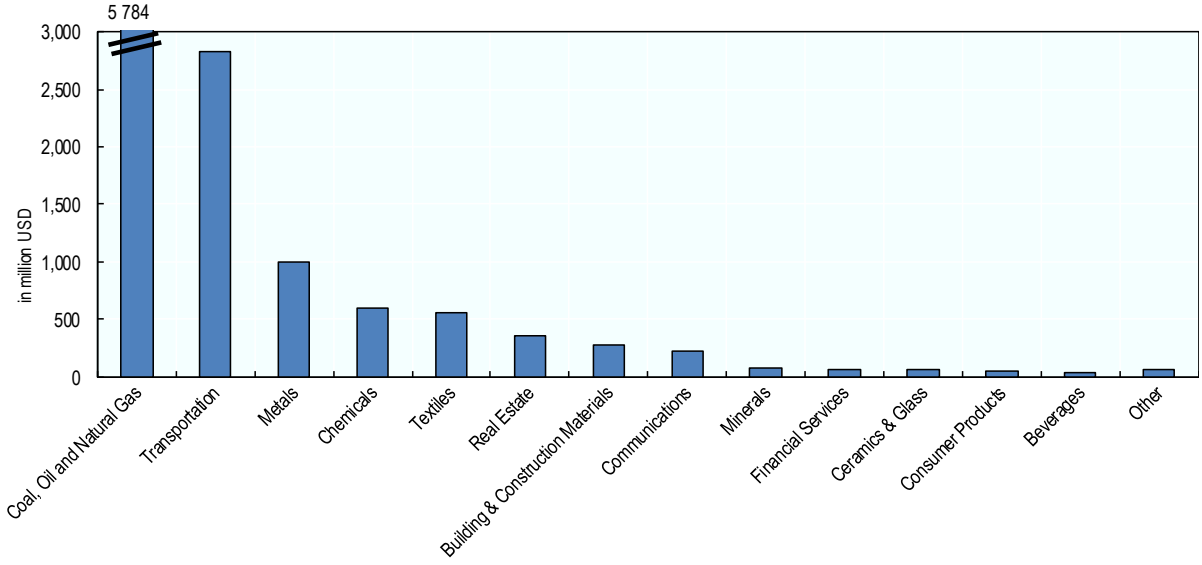


Source: Asian Development Bank Institute (2014[15]), *Connecting Central Asia with Economic Centers*, Asian Development Bank Institute, https://www.adb.org/sites/default/files/publication/159307/adbi-connecting-central-asia-economic-centers-final-report.pdf

Between 2003 and 2017, Turkmenistan attracted over USD 12 billion of announced cross-border greenfield FDI projects, which is higher than some of its peers such as the Kyrgyz Republic (USD 6.2 billion) or Tajikistan (USD 6.9 billion), but lower than Uzbekistan's USD 26.8 billion. Almost half (or USD 5.7 billion) of foreign investments in Turkmenistan are in oil and natural gas, followed by transportation (24%) and metals (10%) (Figure 8.3). In general, other sectors received much lower FDI during this period. For example, chemicals and textiles received a similar amount of around USD 600 million (or 5%), followed by real estate (USD 36.3 million) and building and construction materials (USD 282.2 million). Only around 1% of greenfield FDI projects were in sectors such as minerals, financial services, or ceramics.

Figure 8.3. Greenfield FDI in Turkmenistan by economic activity, 2003-2017

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



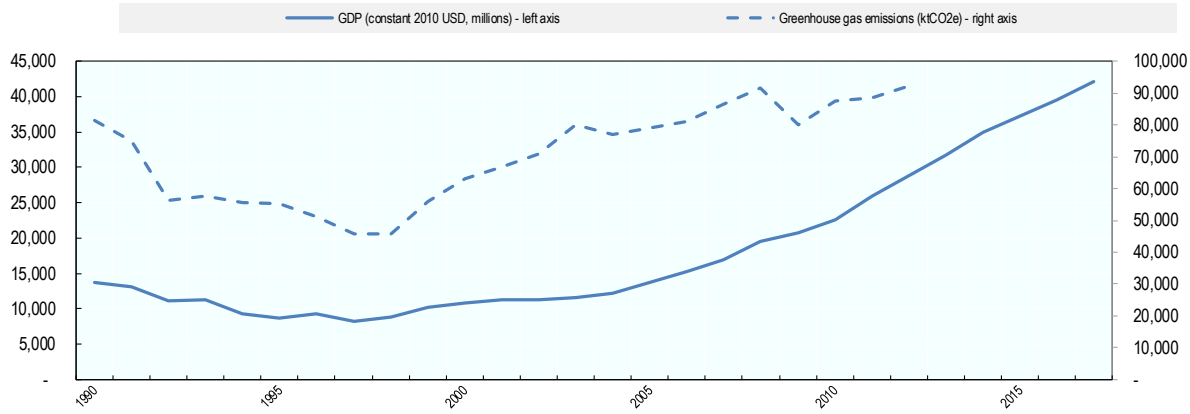
Note:Other includes: Industrial Machinery; Equipment & Tools; Food & Tobacco; Automotive OEM; Software & IT services; Non-Automotive Transport OEM; Electronic Components; and Business Services.
Source: OECD based on fDi Markets (2019[16]), *fDi Markets: the in-depth crossborder investment monitor (database)*, fDi Markets, https://www.fdimarkets.com/

Climate change

Turkmenistan's total greenhouse gas emissions amount to only 0.0017% of global emissions, but its economy is one of the most energy intensive in the former Soviet Union and in the world. In 2012, Turkmenistan emitted 3.2 kgCO_2e per USD of GDP (World Bank, 2019[1]), but its energy intensity has been gradually declining since then (IEA, 2015[17]). Energy accounts for about 83% of Turkmenistan's greenhouse gas emissions (Climate Watch, 2019[18]), 35% of which were emitted as unintended seepage of gases from oil and gas exploitation (OECD, 2016[19]). Turkmenistan's *National Climate Change Strategy* identifies the reduction of natural gas seepage as a key part of the oil and gas sector's contribution to climate change mitigation (see section 8.3 on Turkmenistan's key strategic documents). After energy, agriculture emits the largest amount of GHG at 7%, while industrial processes emit only 2% and bunker fuels and waste account for the remainder (UNDP, 2012[20]).

Like many former Soviet Union countries, Turkmenistan's emissions dropped dramatically following independence, but unlike many Central Asian countries Turkmenistan reached its pre-independence emissions as early as 2003 (see Figure 8.4). Between 1998 and 2012, Turkmenistan's GHG emissions doubled (from 45 829 ktCO2e to 92 178 ktCO2e), but over the same period the country's GDP more than tripled in size and has since grown to almost five times its 1998 levels. Turkmenistan's per capita GHG emissions (17.5 tCO_2e) are the second highest in the region after Kazakhstan and are considerably higher than the OECD average (12.9 tCO_2e) (World Bank, 2019[1]).

Figure 8.4. GHG emissions and GDP of Turkmenistan, 1990-2017



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

Without effective adaptation measures, Turkmenistan could face serious economic setbacks from the impacts of climate change. The agriculture sector is particularly at risk, with potential losses of USD 20.5 billion between 2016 and 2030 (OECD, 2016[19]). Climate change could also lead to 10% annual increases in floods and mudflows, 5% annual increases in heavy rainfall and gradually increasing heatwaves (at a rate of 1.6% per year) (UNDP, 2012[20]).

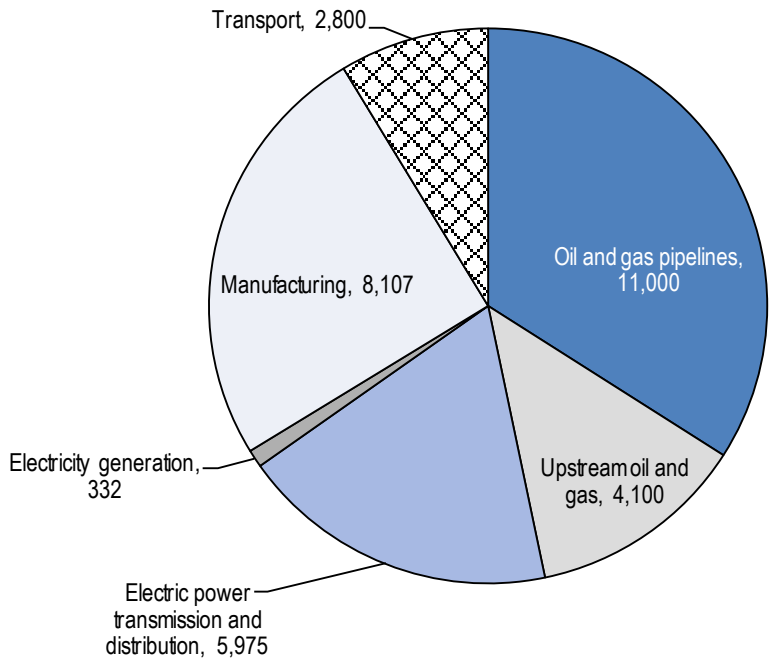
8.2. Turkmenistan's infrastructure needs and current plans

Turkmenistan needs to scale up investment in infrastructure, particularly in the transport sector, to reap the economic benefits of its position near major markets in Iran, South Asia and, across the Caspian Sea, the Russian Federation (ADB, 2017[21]). Although the country's infrastructure network covers its entire territory, the services it provides are substandard and insufficient (Bertelsmann Stiftung, 2018[22]). Turkmenistan scores poorly in the World Bank's Logistics Performance Index, with an overall score of 2.34 (out of 5) and a ranking of 142 (of 167 countries surveyed). Turkmenistan's infrastructure quality, according to the Index's infrastructure indicator, is particularly weak with a score of 2.23 (out of 5), on par with the Kyrgyz Republic and only slightly better than Tajikistan (World Bank, 2018[23]).

The energy sector in particular dominates Turkmenistan's large-scale infrastructure plans. Out of the USD 32.3 billion of investments tracked in recent years, energy projects account for over 66% (USD 21.4 billion) while manufacturing and transport account for 25% and 9% respectively (see Figure 2.2). Nearly half of the total energy investments planned and under construction are large-scale oil and gas pipelines (over USD 11 billion), followed by electric power transmission and distribution (USD 6 billion), upstream oil and gas projects (USD 4.1 billion), and natural gas-fired electric power plants (USD 332 million) (Figure 8.5). Based on the data available, around 80% of these projects are greenfield, 13% brownfield, while for the remaining 7% of the projects the data is not available.

Figure 8.5. Infrastructure projects in Turkmenistan by sector

Planned and under construction in USD million



Note: Transport projects include roads and railways; oil and gas pipelines include large scale cross-border gas pipelines; upstream oil and gas include gas field projects and gas to gasoline projects; electric power, transmission and distribution projects include cross-border and national transmission lines; electricity generation projects includes natural gas-fired electric power plants; manufacturing projects include petrochemical and fertiliser plants.
Source: OECD based on IJGlobal (2019[24]), ADB (2019[25]), Dealogic (2019[26]), and CSIS (2019[27])as of April 2019.

Transport

Geographical particularities of Turkmenistan complicate the development of transport infrastructure. It has the second lowest population density in Central Asia after Kazakhstan, at 12.451 people per square kilometre (World Bank, 2019[1]), and deserts cover about 80% of its territory (EBRD, 2014[7]). Road and rail construction, therefore, requires additional costs for sand dune fixation to avoid the encroachment of sand on the infrastructure (UNECE, 2012[28]). The lack of private sector involvement in transport infrastructure construction and operation is another factor in its poor performance. Despite some improvements, domestic road quality impedes the transit of goods and people, and deficient governance and transparency in state-owned rail services contribute to poor service delivery (EBRD, 2014[7]).

Recent developments in Turkmenistan's transport sector have markedly increased connectivity with its neighbours. In particular, the Turkmenbashi International Sea Port on the Caspian Sea, which was completed in 2018 (Turkmenbashi International Seaport, n.d.[29]), and a rail link connecting Kazakhstan to Iran via Turkmenistan, which was completed in 2014 (Railway Gazette, 2014[30]), facilitate regional trade flows. According to Turkmenistan's response to a recent OECD survey, the government has

plans to increase domestic connectivity by constructing high-speed road links between Turkmenbashi and Turkmenabad as well as between Turkmenbashi and Garabogaz.

In the transport sector, Turkmenistan currently does not have a large number of investment projects planned and under construction. According to information available from various datasets, there are three projects for a total of around USD 2.8 billion focusing on cross-border roads and railways (see Table 8.1). In particular, Afghanistan-Turkmenistan-Azerbaijan-Georgia-Turkey Transport Corridor is a multi-modal project focusing on both railways and roads between five countries, including Turkmenistan, which is among the largest planned investments in the country. The project is expected to boost regional integration and increase trade with other countries. Other cross-border projects include the Bereket-Etrek-Turkmenistan-Iran Border Railway and the CAREC Corridor 2, 3 and 6 (Turkmenabat-Mary) Railway Modernization Project both of which are expected to stimulate pro-poor economic growth. In general, transport infrastructure projects are of significant importance for Turkmenistan, to help ease the transportation of bulky goods such as oil and oil products, mineral resources, agricultural products and textiles.

Although multilateral development banks do not have a strong presence in the country, they have nevertheless been financing important cross-border transport projects. For example, the Asian Development Bank has been supporting Turkmenistan over the years to increase connectivity and develop an integrated and efficient railway system to improve connectivity with neighbouring Kazakhstan, the Persian Gulf countries, the Russian Federation and South Asia (ADB, 2018[31]).

The Ministry of Transport is currently embarking on a railway modernisation program, which involves the construction of new railway lines and rehabilitation of the existing ones. Although there are no quantitative goals, Turkmenistan's *National Climate Change Strategy* lays out the following priorities by 2030: public transport and light rail development; renewal of car fleet with incentives for greater fuel efficiency; movement towards vehicles that run on natural gas; electrification of rail services (UNDP, 2012[20]).

Table 8.2. Hotspot projects in the transport sector in Turkmenistan

Name	Sub-sector	Description	Project value (USD million)	Funding source	Type of investment
(a) Under construction					
Bereket-Etrek-Turkmenistan-Iran Border Railway (Construction)	Railway	The project is financed by the Islamic Development Bank and includes construction of the railway lines, nine stations as well as a locomotive transfer and maintenance depots in Etrek and Bereket.	700	Islamic Development Bank, others	Greenfield
(b) Planned					
Afghanistan-Turkmenistan-Azerbaijan-Georgia-Turkey Transport Corridor	Railway and roads	The project will connect several cities of the countries involved. For Turkmenistan, it will provide links between the Afghan province of Herat with Ashgabat, and with the Caspian port of Turkmenbashi. As a large cross-border project, it is expected to intensify the economic integration of the region and increase the volume of trade between Turkmenistan and other countries.	2 000	Government of Afghanistan (20%), Government of Turkmenistan (20%), Government of Azerbaijan (20%), Government of Georgia (20%), Government of Turkey (20%)	Greenfield
Central Asia Regional Economic Cooperation Corridors 2, 3 and 6 (Turkmenabat-Mary) Railway Modernization Project	Railway	The project entails a 1147km line from Turkmenabat to Turkmenbashi. In turn, travel costs and environmental costs are expected to be reduced for passenger and freight transport between Turkmenabat and Mary.	100	Asian Development Bank	Brownfield

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.
Source: OECD analysis based on accessed data from ADB (2019[25]), IJGlobal (2019[24]), CSIS (2019[27]) as of April 2019.

Energy

Turkmenistan's electricity transmission and distribution systems are inefficient, resulting in losses of 12.5% of the power they transport. However, like all other former Soviet Union countries, Turkmenistan has achieved universal access to electricity (World Bank, 2019[1]).

Turkmenistan is a net exporter of energy, including oil (6.06 Mt in 2015, 4.08 Mt in 2016), electricity (0.28 Mtoe in both 2015 and 2016) and, most importantly, natural gas (43.62 Mtoe in 2015 and 45.06 Mtoe in 2016) (IEA, 2018[32]). Turkmenistan does not face the same energy security concerns of some of its neighbours, but its economic reliance on natural gas exports exposes the country's economy to fluctuations in gas markets.

Reflecting the abundance of natural gas reserves in the country, Turkmenistan relies on natural gas for the entirety of its electricity generation (22 534 GWh in 2016). In the 1990s, Turkmenistan generated some of its electricity through hydroelectric dams, but its share declined quickly (700 GWh of hydroelectricity in 1990 down to 4 GWh in 1995) before disappearing altogether.

A particularity of the energy sector in Turkmenistan is the pervasiveness of subsidies, with Turkmen citizens enjoying free access to a set amount of electricity, heat and gas. Although the government guaranteed the continuation of these subsidies until 2030, growing energy demand and government debt have led to increasing momentum within the government to reduce subsidies before 2030 (IEA, 2015[33]).

Despite the outsized role that natural gas plays in Turkmenistan's economy, energy mix and exports, the government has not convincingly signalled that diversification is a priority. Although Turkmenistan's *National Climate Change Strategy* mentions economic diversification as a future policy direction (UNDP, 2012[20]), its *Oil and Gas Development Plan to 2030* aims to boost gas production up to 250 billion m^3 and oil production to 110 Mt by 2030 (IEA, 2015[33]).

The *Concept of Electricity Sector Development of Turkmenistan for 2013-2020* envisions high-voltage electricity transmission connections uniting the Turkmen electricity grid and the construction of high-voltage connections with Iran (Mary-Sarakhs-Meshkhed, Balkanabat-Gonbad). The government plans to increase electricity exports to Iran (Turkmen Portal, 2017[34]).

The National Climate Change Strategy highlights the modernisation of gas and oil pipelines as a priority, especially for reducing leakage. For renewables, it calls for small and medium-sized renewable energy generation in remote and sparsely populated regions "in the short-term" which the strategy defines as by 2020. In the medium term (which the strategy defines as 2030) and long term (undefined) it aims to have larger-scale generation and increase the share of renewables in electricity generation but does not set a quantitative target. Currently there are no renewable energy sources in Turkmenistan's energy mix.

Turkmenistan's energy infrastructure projects planned and under construction are large scale, costing over USD 20 billion (see Table 8.3). Given its small domestic market, its large gas reserves (eight trillion cubic meters of proven reserves, ranked 4th in the world) and its excess electricity generation capacity, Turkmenistan's energy projects are mainly in pipelines and cross-border electricity transmission projects, which will allow the country to better access export markets.

One of the flagship projects is the Turkmenistan-Afghanistan-Pakistan-India (TAPI) Gas Pipeline. It stretches over of 1 814 km, reaching from Turkmenistan to India, and aims to supply Turkmen gas (about 33 billion m^3 per year) to the large Indian market. Another high-impact project is the 500 km of electricity transmission lines linking Turkmenistan to the Afghani and Pakistani grids, connecting 4 000 MW of power to regional export markets.

Table 8.3. Hotspot projects in the energy sector in Turkmenistan

Name	Sub-sector	Description	Project value (USD million)	Funding source	Type of investment
Turkmenistan-Afghanistan-Pakistan-India (TAPI) Gas Pipeline	Oil and gas pipelines	The gas pipeline will have a length of 1814 km to carry gas from Turkmenistan's Galkynysh field through Afghanistan, Pakistan and India. The pipeline will have an annual capacity of 22 billion cubic meters of gas.	7 000	Turkmengas (85%), Afghan Gas Enterprise (5%), Inter State Gas Systems (5%), GAIL (5%)	Greenfield
Turkmenistan-Afghanistan-Pakistan (TAP) Transmission Line (500 KM)	Electric power transmission and distribution	The project will develop a 500 km electricity grid connecting Turkmenistan-Afghanistan and Pakistan. Upon completion, the project is expected to transfer around 4000 MW of power from Turkmenistan to Afghanistan and Pakistan.	5 300	Government of Turkmenistan (33.33%), Government of Pakistan (33.33%), Government of Afghanistan (33.33%)	Greenfield
South Lolotan Gas Field Second Phase Development	Upstream oil and gas	The project is located in Mary province and is considered the second-largest gas field in the world.	4 100	N/A	Greenfield
East-West Gas Pipeline	Oil and gas pipelines	The project consists of a gas pipeline of over 1 000 kilometres in length from east to the west of Turkmenistan. The project is expected to enhance the country's export capacity.	2 000	Turkmengas (100%)	Greenfield
Trans-Caspian Gas Pipeline	Oil and gas pipelines	The project involves the construction of a 300 km shoreline pipeline along the Caspian with a capacity of 10 billion cubic metres a year. As part of the project, Turkmenistan will export gas to Russia via Kazakhstan.	2 000	Government of Azerbaijan (100%)	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.
Source: OECD analysis based on accessed data from IJGlobal (2019[24]) and Dealogic (2019[26]) as of April 2019.

Industry and mining

Turkmenistan's *National Climate Change Strategy* focuses on energy efficiency measures in industry. Beyond supporting the oil and gas sector and related sectors (refineries, chemicals and petrochemicals), the Strategy calls for further development of non-hydrocarbon industries in Turkmenistan such as vehicle manufacturing, metal processing, construction material production, light industry and foodstuffs. However, the Strategy does not provide clear qualitative or quantitative goals.

Currently, there are limited industry projects planned or under construction in Turkmenistan but they have a significant investment amount. Table 8.4shows that the projects that are being currently promoted are in the chemicals and coke and refined petroleum sectors. All these projects are greenfield investments and are being funded either by Korean corporations such as LG Corporation and Hyunday Engineering & Construction, or by domestic companies such as Turkenhimiya or Turkmengas.

The response from the country to the OECD survey carried out for this study corroborates the information in Table 8.4, and highlights the importance of the following projects: the Kiyanly Project (which will produce 5 billion m³ of natural gas in addition to polyethelene, carbamide and ammonia) and the Garabogaz Fertiliser Plant (which will produce 1 million tonnes of carbamide and 650 thousand tonnes of ammonia annually). Other large-scale projects include the Turkmenbashi oil refinery (which will produce 10 million tonnes of oil per year; production of motor fuel and oil, polypropylene, bitumen), several gas chemical processing plants (e.g. Mary, Ovadandepe) and chemical processing plants (Balkanabad iodine factory, Hazar chemical factory).

Table 8.4. Hotspot projects in the industry sector in Turkmenistan

Name	Sub-sector	Description	Project value (USD million)	Funding source	Type of investment
Turkmen Kiyanly Project	Coke and refined petroleum	The project involves the construction of a gas-to-liquids plant in Kiyanly with an annual capacity of 600 000 tonnes of synthetic fuel.	3 500	LG Corporation, Hyundai Engineering & Construction	Greenfield
Seidi Petrochemical Plant	Chemicals	The project will develop a petrochemical plant in Seidi that is expected to produce 290 000 tonnes of polyvinyl chloride and 190 000 tonnes of sodium hydrate a year.	2 000	LG Corporation, Hyundai Engineering & Construction	Greenfield
Garabogaz Fertiliser Plant	Chemicals	The project will develop a fertiliser plant in Garabogaz producing 2 000 metric tonnes per day of ammonia and 3 500 tonnes of urea using existing gas fields produced by Turkmengas.	1 365	Turkmenhimiya	Greenfield
Turkmenistan Gas to Gasoline Project	Coke and refined petroleum	The project will build a gas-to-liquids plant in Obadan, processing 1 785 billion cubic metres of natural gas per year. It is expected to produce 600 000 tonnes of gasoline per annum.	1 241	Turkmengas	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.
Source: OECD analysis based on accessed data from IJGlobal (2019[24]) accessed as of April 2019.

8.3. 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

Turkmenistan has adopted several strategic documents, one of the most notable being its *National Socioeconomic Development Programme for 2011-2030* in 2010 (Table 8.5), which has since been supplemented with a shorter-term document for 2019-2025. While these documents present a vision of Turkmenistan's future development, notably to diversify its economy away from reliance on natural gas, they do not offer a concrete set of intermediate steps. In general, Turkmenistan's strategic documents are not actionable, since they do not specify which state body takes ultimate responsibility for the delivery of goals, and there are no quantitative – or at least verifiable – goals against which to measure progress on implementation.

Turkmenistan's *National Climate Change Strategy* suffers from similar deficiencies. Although it sets out a vision for Turkmenistan's future economic development in which renewables play a role in the country's energy mix and high-tech sectors ease economic dependence on fossil fuels, the plan for achieving these goals is largely absent. The government is currently updating the strategy (Dolgova, 2018[35]), and it could consider setting more concrete, actionable goals and clearly identifying which government bodies are responsible for progress towards them.

In addition to the multitude of strategic documents, national legislation has included provisions for environmental impact assessments (EIAs) since 2000 but, in practice, EIAs are regularly carried out without public participation and consultation. Without the application of public participation procedures, stakeholder concerns risk being ignored in the development of infrastructure projects, which cuts planners off from valuable public feedback and criticism. The government has not yet adopted legislation on strategic environmental assessments (SEAs) and does not carry out such assessments (UNECE, 2012[28]).

The public lacks access to key information relating to government policy, environmental regulations and the state of the environment. Moreover, Internet services in the country are slow and expensive. Access to the Internet and, in particular, social media is poor, and Internet literacy is underdeveloped. The government does not publish the texts of regulations or government decisions online, and the State Committee on Statistics does not make its data available to the public. Although the government publishes legislation on its website, it does not provide a search function or classification system to help the public find relevant laws (State News Agency of Turkmenistan, n.d.[36]).

Although Turkmenistan is a party to the UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (the Aarhus Convention), it does not comply with its obligations (UNECE, 2012[28]). The government could make efforts to bring its practices in line with the Convention and establish accessible, user-friendly platforms where the public can access relevant information.

Institutional set-up and decision making processes

Turkmenistan has combined a number of independent ministries in order to streamline governance. In early 2019, several ministries (the industry-related divisions of the

Ministry of Energy and Industry as well as the Ministry of Road Transport, the Ministry of Railway Transportation and the Ministry of Communications) were merged into a new ministry, the Ministry of Industry and Communication. The government undertook this consolidation in part to improve implementation of reforms on policies related to transport, communications and industry (State News Agency of Turkmenistan, 2019[14]). If the integration of the formerly independent ministries allows for more effective policy coordination, Turkmenistan's new institutional set-up could improve the integrated planning of the country's transport infrastructure.

It has also merged the State Committee on Environmental Protection (formerly an independent ministry) with the Ministry of Agriculture and Water Economy (which itself was formed from two separate ministries) to form the Ministry of Agriculture and Nature Protection in January 2019 (Turkmen Portal, 2019[37]). There is a risk that environmental policy will not stand as high on the newly formed ministry's agenda, and the government should ensure that the new institutional set-up does not weaken the government's ability to take environmental policy into account in policy making.

Temporary inter-sectoral coordination bodies do exist in the form of State Commissions, which the President can establish on an ad hoc basis for crosscutting challenges, such as climate change. As a rule State Commissions meet only irregularly and bureaucratic complexity combined with a lack of resources hamper the implementation of their decisions (UNECE, 2012[28]). The President has created State Commissions on climate change, for issues related to the Caspian Sea and for implementing the Turkmenistan's commitments under UN environmental conventions and programmes. The State Commission on climate change, however, was never operational and is now inactive, although there have been discussions in the government about re-establishing it.

State Commissions consist of representatives from relevant ministries, other state bodies and state-owned enterprises, but information on the current composition of the environment-related state commissions is not publicly available. Depending on the State Commission on Climate Change's current structure, it could have the potential to serve as an effective tool in coordinating government action and integrating climate concerns across ministerial portfolios. However, UNECE identified irregular meetings and a lack of assigned resources as major barriers to the efficacy of State Commissions in pursuing policy objectives (UNECE, 2012[28]).

List of relevant strategic documents

Table 8.5. Main strategic documents in force

	Status	Time Horizon	Sectoral Coverage	Main objectives
First Nationally Determined Contribution (NDC)	Submitted in 2016	2016-2030	Economy-wide	• Unconditional Target: GHG will significantly lag behind GDP growth • Conditional Target: achieve zero growth in GHG emissions and even reduce them by 2030 • Main sectors for emission reduction: Energy (oil and gas is the main source of GHG emissions, therefore a move towards alternative energy sources is vital as well as increasing efficiency and energy conservation), Industry (ensuring industrial processes become more

				efficient with low emission production), Transport (move towards more modern, less emission intensive transport infrastructure) • Adaptation priorities: *National Socioeconomic Development Programme for 2011-2030* and the *National Climate Change Strategy* as well as other strategic documents
National Climate Change Strategy	Adopted in 2012	No defined timeframe	Governance, planning, transport, energy, water, industry	• Promote economic diversification • Increase the share of renewable energy, with a focus on developing small and medium sized renewable energy generation facilities in sparsely populated areas in the short-term (by 2020) • Modernise gas and oil pipelines to decrease seepage of natural gas • Promote development of non-hydrocarbon industries • Develop and promote the use of modern irrigation systems • Improve public transit and provide incentives for greater fuel efficiency • Develop a light rail system and ensure electrification of current rail services
National Socioeconomic Development Programme for 2011-2030	Adopted in 2010	2011-2030	Governance, planning, energy, industry, transport	• Aim to diversify the economy, in part reducing reliance on natural gas • Improve the investment climate • Promote the expansion of the private sector • Modernise industrial production with the use of new technology • Accelerate growth of the production potential of the chemical and light industry
Concept of Electricity Sector Development of Turkmenistan for 2013-2020	Adopted in 2013	2013-2020	Energy	• Construction of new gas turbine power plants and rehabilitation of current plants • Installation of high-voltage electricity transmission lines in order to unite Turkmenistan's electricity grid • Construct high-voltage connections with Iran to increase electricity exports

Table 8.6. Other relevant documents

	Status	Time Horizon	Sectoral Coverage
Multi-sector Programme for Socio-Economic Development of Turkmenistan for 2012-2016	Adopted in 2012	2012-2016	Multi-sector
Multi-sector Programme of the President of Turkmenistan on Social and Economic Development of the Country in 2019-2025	Adopted in 2019	2019-2025	Multi-sector
Programme for development of transport and communication areas for 2012-2016	Adopted in 2012	2012-2016	Transport, ICT
General plan for development of the railway transport	Adopted in 2012	2012-2016	Transport
General plan of the Ministry of automobile transport for 2012-2016	Adopted in 2012	2012-2016	Transport
National programme for the development of civil aviation	Adopted in 2012	2012-2016	Transport
National Environmental Action Plan for 2002-2010	Adopted in 2002	2002-2010	Multi-sector
Biodiversity Strategy and Action Plan of Turkmenistan for 2002-2010	Adopted in 2002	2002-2010	Multi-sector
National Caspian Action Plan for 2008-2011	Adopted in 2008	2008-2011	Multi-sector
Programme of Development of Economic, Financial and Banking Systems of Turkmenistan for 2012-2016	Adopted in 2012	2012-2016	Multi-sector
Programme of Development of an Intellectual Property System of Turkmenistan for 2015-2020	Adopted in 2015	2015-2020	Multi-sector
Concept of the Foreign Policy of Turkmenistan for 2017-2023	Adopted in 2017	2017-2023	Multi-sector
Concept of Development of the Digital Economy of Turkmenistan for 2019-2025	Adopted in 2018	2019-2025	Multi-sector

Notes

[i] The Investment Freedom measure is a component of the Economic Freedom Index developed by the Heritage Foundation and it measures regulatory restrictions on a country's investment regime in the following areas: national treatment of foreign investment, foreign investment code, restrictions on land ownership, sectorial investment restrictions, expropriation of investment without fair compensation, foreign exchange controls and capital controls.

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Chapter 9. Uzbekistan's sustainable infrastructure investments

This chapter describes sustainable infrastructure planning in Uzbekistan and presents current trends in investment in large-scale infrastructure projects. It compares Uzbekistan's infrastructure plans in the energy, transport, industry and water sectors against its international commitments under the Paris Agreement on climate change and the Sustainable Development Goals (SDGs). The chapter also explores Uzbekistan's strategic documents for long-term economic development, sectoral development and the environment, including those related to climate change mitigation and adaptation. It identifies misalignments between stated goals and observed investment flows and provides recommendations to improve strategic planning for sustainable infrastructure.

Overview

Uzbekistan is a lower-middle income country and the most populous country in Central Asia. Its economy still relies heavily on gold exports, fuels and cotton. Uzbekistan's main trade partners include Switzerland, mainly as a market for its gold exports; the People's Republic of China, first import origin country and second export destination; and the Russian Federation. While the government has historically followed a protectionist trade policy, since 2017, a greater openness to trade has become one of the most important pillars of the economic reform agenda. Economic diversification and moving up the value chains towards high-tech industries is also one of the country's main priorities.

The government has embarked on a number of major reforms aimed at improving the investment climate for both domestic and foreign investors. In 2019, the country is ranked 74th out of 190 countries, up by 14 places from 2017, and is among the 10 most improved countries in 2018. Some challenges remain, related to the dominance of SOEs in the overall economy leading to discriminatory measures for foreign investors. The Russian Federation remains the most important investor in Uzbekistan, contributing 55% of FDI, followed by China (15%). Almost 50% of Uzbekistan's FDI benefit the coal, oil and natural gas industries.

While Uzbekistan's contribution to global GHG emissions remain limited (0.33%), it is one of the most emissions-intensive economies of the world due to a fossil fuel-intensive energy mix (dominated by natural gas), ageing energy infrastructure, elevated energy subsidies and an energy-intensive industrial sector (e.g. cement). Uzbekistan is also particularly vulnerable to the effects of climate change: the capital Tashkent and the Fergana Valley have registered annual average temperatures 1.8°C and 1.6°C above pre-industrial levels, much higher than the global average temperature rise. This is a key source of concern for the agriculture sector, which is by far the largest user of water in the country.

While the geographic situation of Uzbekistan makes it an excellent candidate to become one of the main nodes on the transit route between China and Europe, it faces one of the most serious infrastructure investment gaps in the region, even to maintain current network performance. Despite an extensive network of roads and rail, logistics bottlenecks remain a major impediment to increasing the country's connectivity due to low efficiency and poor service quality. In the energy sector, almost 40% of Uzbekistan's available generation capacity is past service life leading to frequent power outages. While the development of renewable energy is a national priority to diversify its energy mix, an analysis of the current pipeline of projects shows that around 60% of planned and under construction power generation projects remain in natural gas.

Recent institutional reforms created a strong institutional framework for improved coordination between ministers relevant to infrastructure and environment. Strategic documents such as the *Action Strategy on Five Priority Directions for the Development of the Republic of Uzbekistan 2017-2021* set out a clear vision for Uzbekistan's development over the next five years, and it includes specific sectoral plans in transport, energy and industry. Aligning current investment plans with long-term development and environmental challenges would require Uzbekistan to plan for the long term now, and adopt a longer-term economy-wide development strategy to articulate its plans further into the future.

9.1. State of play: economy, investment and climate change in Uzbekistan

Economy and trade

Table 9.1. Key indicators on Uzbekistan's economy

Population (2018)	32 955 400
Urbanisation rate (2018)	50.5%
Annual population growth (2018)	1.7%
Surface area	447 400 km^2
GDP (USD, current price, 2017)	50 500 million
GDP per capita (USD, current price, 2018)	1 532
Real GDP growth (year-on-year change, 2018)	5.1%
Inflation (average consumer price, y-o-y change)	n.d.
Exports of goods and services (% of GDP, 2018)	29.1%
Imports of goods and services (% of GDP, 2018)	38.7%
FDI, net inflows (% of GDP, 2018)	1.2%
General government net lending/borrowing (% of GDP, 2018)	0.9%
Unemployment (% of total labour force, 2018)	5.2%
Remittances (% of GDP, 2016)	3.0%
Transparency, accountability and corruption in the public sector rating (1= most corrupt, 6 = least corrupt, 2017)	2

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

Uzbekistan is a lower-middle income country and the most populous country in Central Asia. Its population of 32 million people is largely urban, with 51% in urban areas. Its GDP did not fall as dramatically as other Central Asian economies when the Soviet Union split, and it was the first country in Central Asia to reach its pre-independence per-capita GDP level in 1999. The service sector accounts for the largest portion of Uzbekistan's economy at 39.9%, but industry (29.5%) and agriculture (17.3%) remain important. Agriculture's share of GDP is the largest in the region after Tajikistan (World Bank, 2019[1]).

Trade

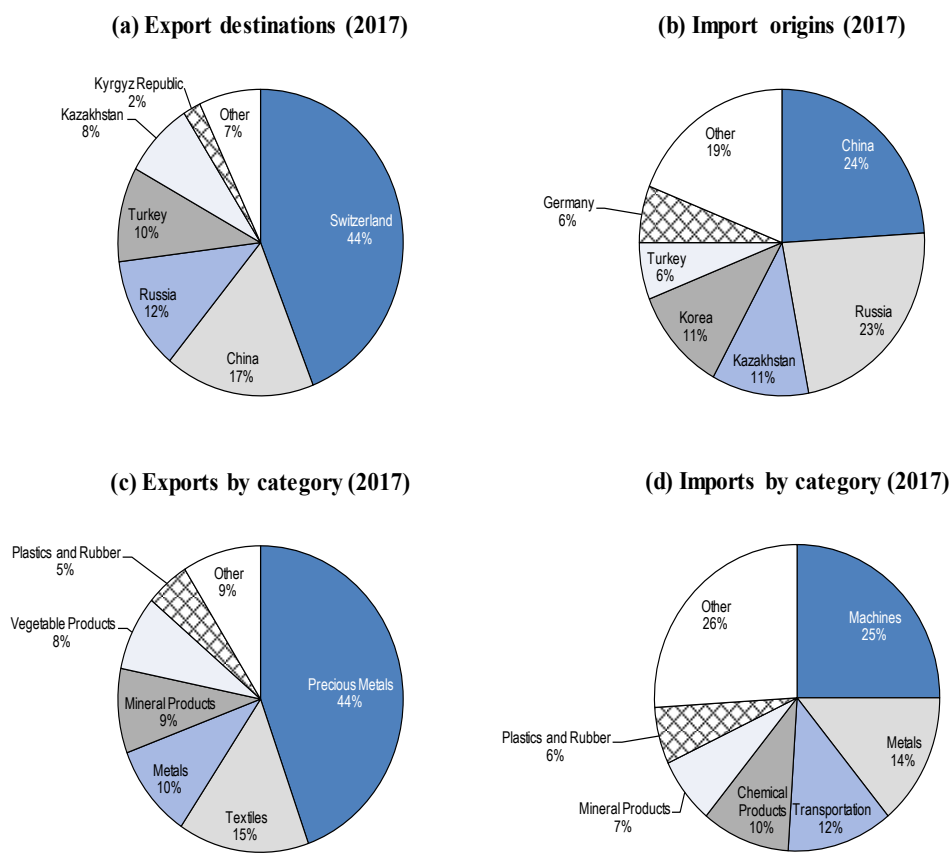
The government has traditionally followed a protectionist trade policy focusing on import substitution of industries and restriction of exports of food and other products in order to ensure their supply in the domestic market (Ganiev and Yusupov, 2012[3]). All major industries of the country's infrastructure sector are owned or controlled by the state (International Trade Administration, 2019[4]). However, since 2017, a greater openness to trade has become one of the most important pillars of the economic reform agenda, including a renewed commitment to join the World Trade Organisation (WTO), to which Uzbekistan is currently an observer (World Trade Organisation, 2019[5]). Further trade opening and WTO membership would help Uzbekistan reach international

standards and maintain access to export markets (IMF, 2018[6]). The country is not a member of the Eurasian Economic Union, although it has occasionally expressed interest in strengthening ties.

Uzbekistan's exports are mostly raw resources or basic manufactures. Gold accounts for 44% of Uzbekistan's exports by value, while precious metals as a whole account for 45% (see Figure 9.1(c)). Uzbekistan's next largest export sectors are textiles (primarily cotton – cotton yarn is 7.1% of exports and raw cotton 2.2%), other metals (refined copper 3.7%, raw zinc 2.2%, copper wire 2.5%) and mineral products (petroleum gas 8.3%). Uzbekistan's imports are primarily finished products, especially machines (25%) and transportation (12%), but also metals (12%) (see Figure 9.1(d)).

The country mainly trades with Switzerland (by far its largest export destination, with 44% of exports by value, because Switzerland refines 70% of the world's annual gold production (Mariani, 2012[7])), the People's Republic of China (its first import origin and second export destination), and the Russian Federation (second import origin and third export destination) (see Figure 9.1(a) and (b)). Kazakhstan and Turkey also account for large shares of exports (8.2% and 9.7% respectively) and imports (11% and 6% respectively).

Figure 9.1. Trade of Uzbekistan



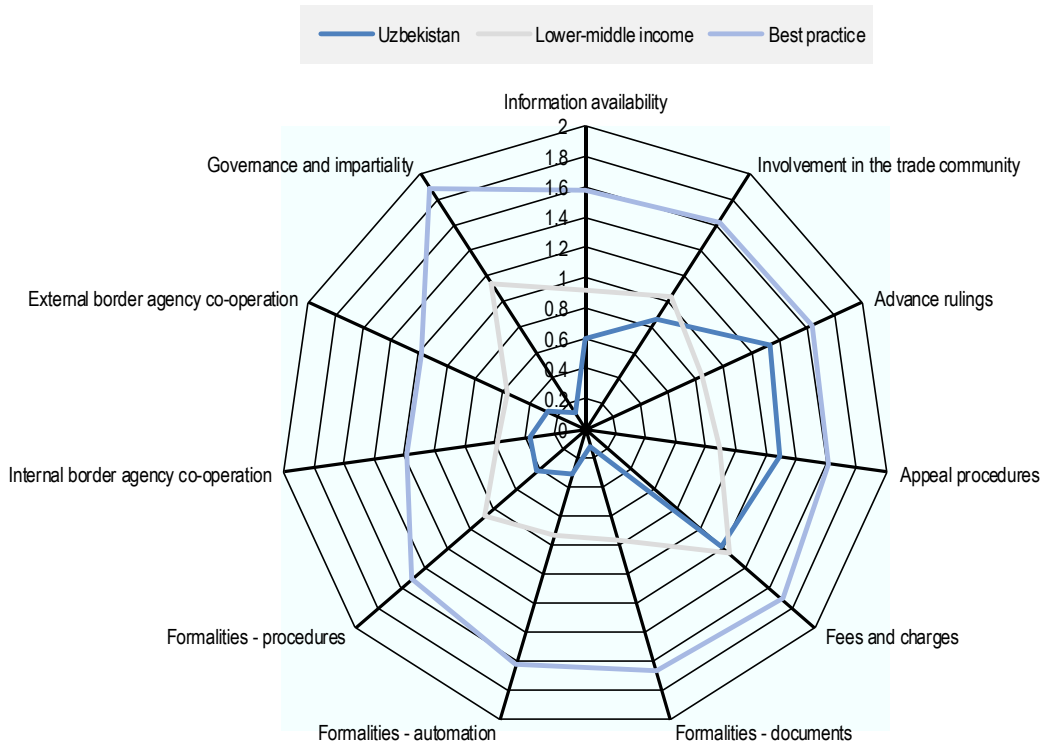
Source: Observatory of Economic Complexity (2017[8]), *Uzbekistan: Exports, Imports and Trade Partners*, Observatory of Economic Complexity, https://atlas.media.mit.edu/en/profile/country/uzb/

Uzbekistan's participation in regional and global value chains (RGVCs) has been concentrated mainly in commodity-type intermediate goods such as base gold, fuels and cotton. The share of intermediate goods in trade, which is a proxy for participation in RGVCs stands at 27% of exports and 53% of imports. These figures are higher than the average for the Asia-Pacific region of 18% for exports and 22% for imports (UNESCAP, 2015[9]). The *Action Strategy on Five Priority Directions for the Development of the Republic of Uzbekistan 2017-2021* (Development Strategy for 2017-2021) aims to enhance the country's participation in RGVCs, including by promoting high-tech industries, primarily for the production of finished products with high value added (for more information on Uzbekistan's strategic documents, see section 9.3).

More trade agreements covering both goods and services could further boost Uzbekistan's RGVC integration. Only nine free trade agreements (FTAs) are in force between Uzbekistan and other countries, and the country has no FTA covering services, which could help the economy not only link up to value chains but also higher value added activities. All other Central Asian countries, except for Turkmenistan, have more FTAs, including smaller economies such as Kyrgyz Republic with 24 FTAs in force (ADB, 2015[10]). More FTAs could also ease trading, which is currently hampered by lengthy procedures at the border and frequent changes in regulations, causing the country to lag behind regional peers in terms of cross-border trade (EBRD, 2018[11]).

As measured by the OECD Trade Facilitation Indicators (OECD, 2019[12]), reforms with the greatest benefit for Uzbekistan are in the areas of formalities (e.g. simplification and harmonisation of documents and procedures), governance and impartiality and availability of information. Uzbekistan's performance is similar to the average performance of lower-middle income countries in some areas such as the involvement of trade community, fees and charges and internal border agency cooperation, but it is below the worldwide best practices in all Trade Facilitation Indicators areas (see Figure 9.2). Further improving trade facilitation could help Uzbekistan become more competitive: In general, a 10% improvement in trade facilitation is correlated with gains in product diversity of about 3%-4% (Dennis and Shepherd, 2011[13]).

Figure 9.2. OECD Trade Facilitation Indicators



Source: OECD (2019[12]), *Trade Facilitation Indicators (database)*, Organisation for Economic Co-operation and Development, http://www.oecd.org/trade/topics/trade-facilitation/

Investment climate

For most of its history since independence Uzbekistan has been closed to foreign investments, making it the country with the least amount of foreign direct investment (FDI) in Central Asia. In recent years, however, it has embarked on a number of major reforms aimed at improving the investment climate for both domestic and foreign investors. Such de jure reforms have led to improved ranking in the World Bank's 2018 Doing Business Report, where the country is ranked 74th out of 190 countries, up by 14 places from 2017, and is among the 10 most improved countries in 2018 (EBRD, 2018[11]).

At the institutional level, new agencies have been created under the Ministry of Investment and Foreign Trade of Uzbekistan, including the Foreign Investment Agency of Uzbekistan, which will provide information and legal support to foreign investors. A one-stop shop is also expected to start servicing foreign investors, while an investment map will provide potential investors with the information on productive profile of each province, demand for the investments and specific projects (NewsCentralAsia, 2019[14]).

Attracting foreign investments is also a key focus of the country's *Action Strategy on Five Priority Directions for the Development of the Republic of Uzbekistan* 2017-2021 (Development Strategy for 2017-2021) and it is one of the main themes of the detailed

annual programme for 2018 under the Strategy (Hashimova, 2019[15]). The 2018 annual strategy has 274 objectives with specific agencies, individuals and budgets assigned to each objective. Each region has appointed officials responsible for attracting investment and executing investment projects.

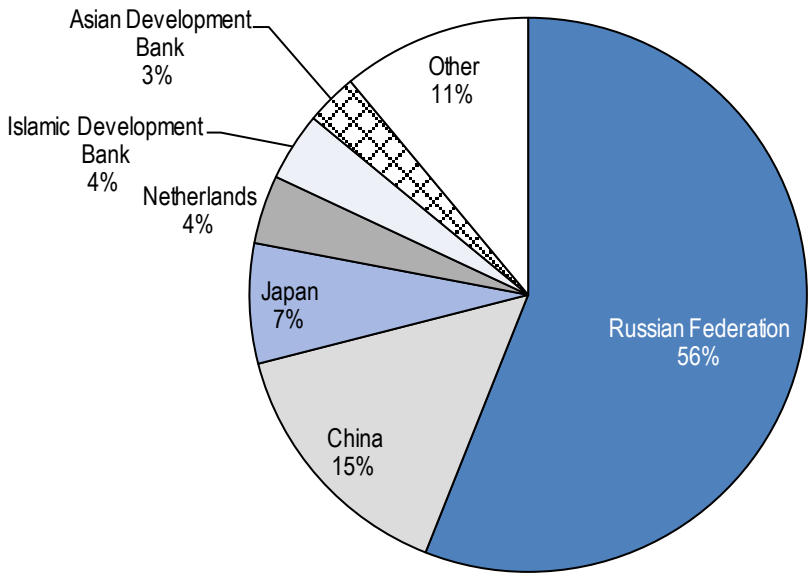
Important economic reforms to improve the investment climate include the moratorium of the inspection of businesses and the simplification of business registration procedures, as well as the removal of the requirement to exchange certain shares of hard currency export earnings at the artificially low, official exchange rate (The Economist, 2019[16]). The government has also reduced the tax burden on businesses and simplified taxation by unifying and abolishing certain payments. It can now issue residence permits valid for 10 years to foreigners investing at least USD 3 million (Hashimova, 2019[15]). The government also plans to reduce corporate tax rates from 14% to 12% for most businesses and to reduce VAT contribution from 20% to 12% (The Economist, 2019[17]). Finally, the government also created a Business Ombudsman office and enacted a Law on Countering Corruption that attempts to increase transparency in the government (United States Department of State, 2019[18]).

Another important part of the investment climate in Uzbekistan is the issue of responsible business conduct (RBC), which is increasingly integrated within policies aimed at attracting better quality investment and enhancing socially and environmentally sustainable investment. Although Uzbekistan is not a signatory to the OECD Guidelines for Multinational Enterprises, it made considerable progress in eradicating child labour and forced labour during the cotton harvest of 2018[i]. 48% less forced labour was used in 2018 compared to the previous year (International Labour Organisation, 2019[19]).

In spite of such achievements, the de facto investment climate remains difficult for foreign investors. While the Law on Foreign Investment stipulates that all sectors of the economy are open to foreign investors and that nationality, place of residence and country of origin cannot justify different government treatment, the state still maintains a strong presence in the economy and has partial state ownership in many key sectors, including energy, telecommunications, airlines and mining. Moreover, the government plays a large role in regulating investments and capital flows in the textile industry, particularly cotton and silk. Such measure still have discriminatory effects on foreign investors. Only 5 517 firms, or 1.8% of all registered firms operating in Uzbekistan receive foreign capital (United States Department of State, 2019[18]). Joint ventures are numerous and some companies benefit from foreign investments, but many have lodged complaints about complications when they attempt to exchange currency or withdraw earnings (Bertelsmann Stiftung, 2018[20]). Recent changes, however, have signalled Uzbekistan's commitment to reform and greater transparency. For instance, Uzbekistan received its first ever credit ratings from Standard & Poor's and Fitch at the end of 2018, providing prospective investors with an international assessment of Uzbekistan's credit risk. Its rating of BB- ("non-investment grade speculative") is in line with Georgia and Viet Nam, placing it between regional leader Kazakhstan (BBB-/BBB, "investment grade") and neighbouring Tajikistan (B-, "highly speculative") (Brookings, 2019[21]). Uzbekistan's approach to foreign investment has meant its external debt has grown over the past decade (reaching 32% of GDP in 2017), but its debt levels and dependence on foreign investors and mainly China are not considered risky (Hurley, Morris and Portelance, 2018[22]).

Currently, some 55.6% of FDI in Uzbekistan comes from the Russian Federation, while China accounts for 15%. The rest of FDI in Uzbekistan comes from OECD countries and multilateral development banks, chief among them Japan (6.6%), the Netherlands (4.3%) and the Islamic Development Bank (4.2%) (see Figure 9.3). Between 2003 and 2017, Uzbekistan attracted USD 26.6 billion of greenfield FDI capital, which is significantly lower than its similar peers. For example, only between 2008 and 2018 FDI amounted to USD 48 billion in Morocco and USD 213 billion in Vietnam (BCG, 2018[23]).

Figure 9.3. FDI in Uzbekistan by source country, 2017

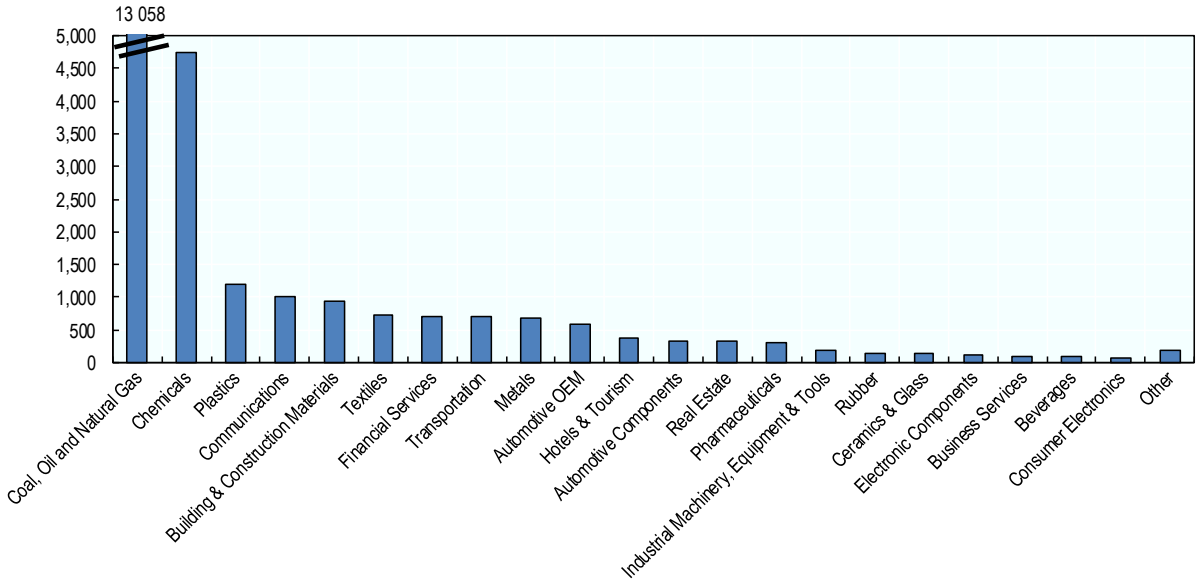


Source: National Statistics Committee of the Republic of Uzbekistan (2017[24]), Инвестиции в основной капитал [Investments in fixed capital], National Statistics Committee of Uzbekistan, https://stat.uz/uploads/docs/investitsiya-yan-dek-2017ru1.pdf

Foreign investors in Uzbekistan are mainly interested in natural resources. Alone, coal, oil and natural gas represented 49% of the total (see Figure 9.4). The manufacture of chemicals, plastics and the communications sector were the other most attractive sectors for greenfield FDI (26% of total greenfield FDI). In general, infrastructure-related activities attracted much lower cross-border investment, with the building and construction materials receiving 4% of total investments (or USD 936.8 million) and transportation (3%).

Figure 9.4. Greenfield FDI in Uzbekistan by economic activity, 2003-2017

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



Note: Other includes: Food & Tobacco; Biotechnology; Software & IT services; Consumer Products; Aerospace; Business Machines & Equipment.
Source: OECD based on fDi Markets (2019[25]), *fDi Markets: the in-depth crossborder investment monitor (database)*, fDi Markets, https://www.fdimarkets.com/

Climate change

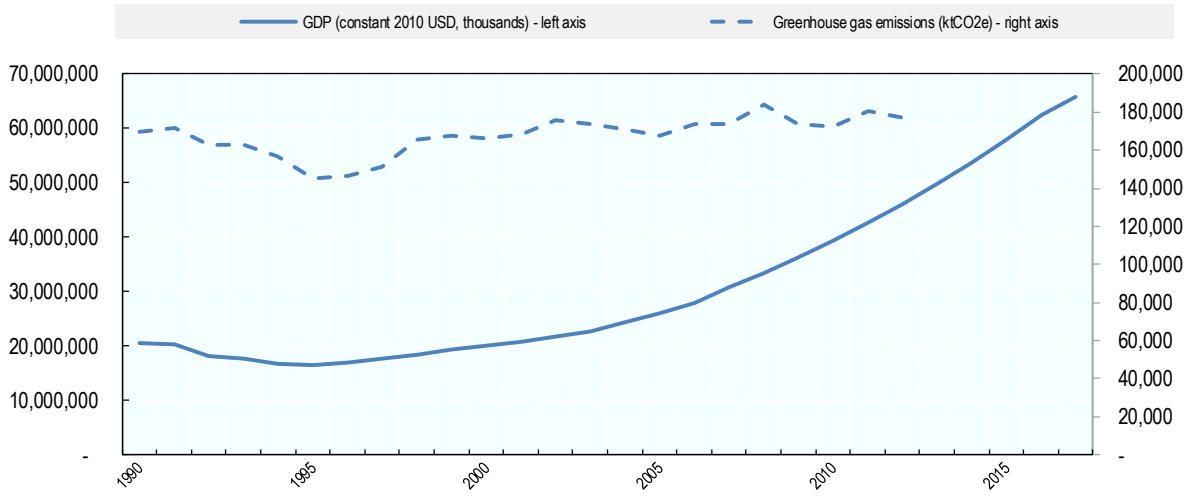
Although Uzbekistan's total greenhouse gas emissions accounted for only 0.33% of global emissions in 2012, Uzbekistan sets itself apart with the emissions intensity of its economy. The emissions intensity of Uzbekistan's GDP was 3.85 kg of CO_2e per USD of GDP in 2012 (World Bank, 2019[1]). This figure is in line with other emissions-intensive economies of the former Soviet Union, such as Kazakhstan and Ukraine, and is among the highest in the world. Recognising this, the climate change mitigation goals in Uzbekistan's Nationally Determined Contribution (NDC) aim to reduce greenhouse gas (GHG) emissions per unit of GDP by 10% compared to 2010 levels by 2030 (UNFCCC, n.d.[26]). Uzbekistan's per capita emissions, however, are quite low at 5.95 tCO_2e per capita. This is far lower than the per capita GHG emissions in neighbouring Kazakhstan (21.8 tonnes), the OECD average (12.9 tonnes) and even the global average (7.5 tonnes) (World Bank, 2019[1]). Despite sustained economic growth since independence, Uzbekistan's greenhouse gas emissions have remained relatively constant over the past several decades (see Figure 9.5).

In 2012, the vast majority of Uzbekistan's greenhouse gas emissions came from the energy sector (82%); agriculture was responsible for 10.5%, and both industrial processes and waste contributed a further 3.8% each. The sectoral breakdown of Uzbekistan's emissions has remained relatively stable since independence (UNEP, 2016[27]).

Uzbekistan is particularly vulnerable to the effects of climate change. Tashkent and the Fergana Valley have registered annual average temperatures 1.8°C and 1.6°C above pre-

industrial levels, much higher than the global average temperature rise. Climate change also threatens the regularity of precipitation and water availability. The runoff in the Amudarya and Syrdarya river basins could decrease by as much as 7-22% and 5-42% respectively, particularly as their glacier sources in neighbouring Tajikistan and the Kyrgyz Republic shrink and disappear. Deficiency of water supply may rise by 11-14% on average across Uzbekistan by 2021-2040, and crop yields may decline due to the higher temperatures and water scarcity (UNEP, 2016[27]).

Figure 9.5. GHG emissions and GDP of Uzbekistan, 1990-2017



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

9.2. Uzbekistan's infrastructure needs and current plans

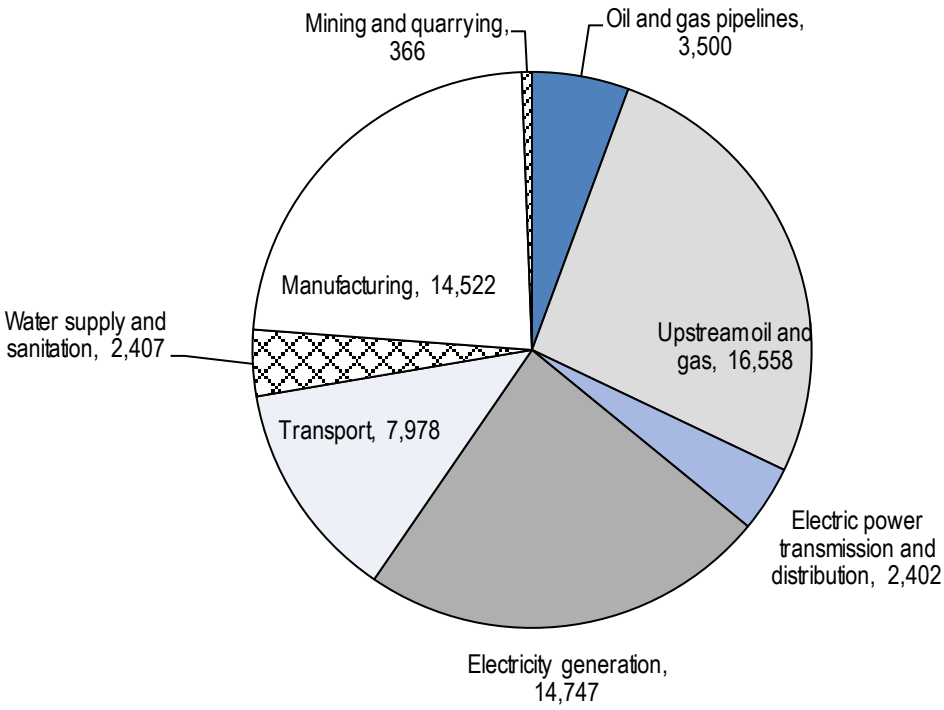
Uzbekistan currently faces the largest infrastructure capacity needs in the region to maintain network performance. Its transport and water infrastructure has not kept pace with demographic and economic changes, and current investments have not sufficiently maintained existing assets. The road sector presents a sizeable backlog in deferred maintenance estimated at USD 1 billion per year. Road infrastructure capacity has to increase by 486% by 2030 and by 1365% by 2050 to meet the expected volume of freight that will pass through Uzbekistan. By 2050, the share of road traffic is expected to increase by 50% from less than 30% in 2015. Rail transit is also expected to increase by 2030 but decrease in 2050, most likely due to construction of new links in Kyrgyz Republic and Tajikistan and the accompanied partial diversion of the traffic flow to these new links (ITF, 2019[28]). The energy sector is also faced with inefficiencies, costing the economy around USD 1.5 billion per year, while the costs associated with the poor quality of existing water and irrigation infrastructure are up to 8% of GDP per year (World Bank, 2016[29]). Such underperforming infrastructure is a major burden on the economy.

Out of USD 70.1 billion of investments in Uzbekistan tracked between 2000 and 2018, energy projects account for over 64% (USD 37.2 billion) while manufacturing and transport make up 23% and 13% respectively. Finally, water supply and sanitation accounts for 4% of planned and under construction investment projects, or USD 2.4 billion. Out of the total energy projects, almost half (45%) are in upstream oil and gas

industry, followed by electricity generation projects (40%). Oil and gas pipelines also account for 9% of investments, while electric power transmission and distribution projects for the remaining 6% (see Figure 9.6). The industry sector is dominated by manufacturing, accounting for over 98% of projects and only 1% mining and quarrying.

Figure 9.6. Infrastructure projects in Uzbekistan, by sector

Planned and under construction 2000-2018 in USD million



Source: OECD based on accessed databases as of April 2019

Transport

Expenditure on the road sector currently accounts for 1.3% of Uzbekistan's GDP. While there was a moderate increase in expenditure between 2005 and 2015, spending remains low by international standards (ADB, n.d.[30]). Such under investment has led to long transport times, inadequate service quality, and high operating costs, leading to lost economic potential, sub-optimal regional trade, and negative environmental impacts (ADB, 2019[31]). The rail sector is also facing numerous challenges, including lack of modernisation of existing railway lines and rolling stock, as well as poor quality of services (ITF, 2019[28]). More investments are needed in the railway industry so that it increases the country's transport and transit potential and creates new jobs.

Transport not only remains a backbone for Uzbekistan's economy but also for neighbouring countries, which depend on Uzbekistan transport network to transport goods and passengers. The rail networks of neighbouring Tajikistan and the Kyrgyz Republic, for instance, depend on transit through Uzbekistan: Tajikistan's and the southern line of the Kyrgyz rail network's only international connection is through southern Uzbekistan (World Bank, n.d.[32]). The cost of transporting goods from Uzbekistan remains very high: It costs USD 175 for one tonne of goods to reach 20%

of global GDP from Uzbekistan, whereas in Germany the same access can be achieved at a cost of about USD 30 (ITF, 2019[28]). A high-speed rail service since 2012 called *Afrosiyob* connects Tashkent and Samarkand, and the service was extended to Bukhara in 2016. Uzbekistan has also recently opened border crossings and road connections with neighbouring Kazakhstan, the Kyrgyz Republic and Tajikistan (EBRD, 2018[33]).

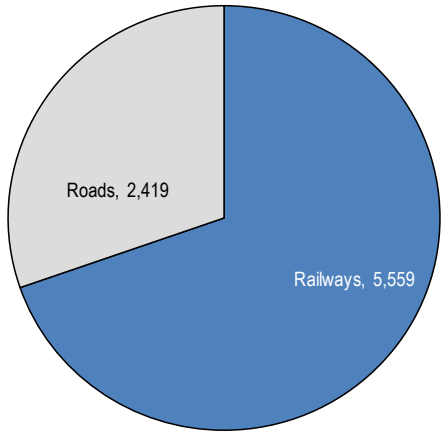
Railways are the dominant mode for freight transport and account for a large share of the market for long-distance passenger transport in Uzbekistan (World Bank, 2014[34]). Over the last decade, it carried about 60 million tons of freight and 15 million passengers annually. The rail density is considerably higher than in neighbouring countries. Uzbekistan has 10 km of rail per km^2, compared to 5 km/km^2 in Kazakhstan, 2 km/km^2 in the Kyrgyz Republic and 4 km/km^2 in Tajikistan. Compared to other countries in the region such as Kyrgyz Republic, Tajikistan, Mongolia, which have no electrified rail links, around 29% of Uzbekistan's rail is electrified, which is an even larger proportion than in Kazakhstan (27%) (ITF, 2019[28]).

Despite an extensive network of roads and railways, logistics bottlenecks remain a major impediment to increasing the country's connectivity. The cost of logistic activities in Uzbekistan is two times higher than in Europe, partly because of low efficiency and service quality (World Bank, 2014[34]). The road density per km^2 is 0.18, with 38% of the roads unpaved (ITF, 2019[28]). Outside of certain regions of the country (Fergana, Namangan and Andijan oblasts), transport links are particularly poor (World Bank, 2016[29]). Such bottlenecks are reflected in the Logistics Performance Index where it ranks 99th out of 160 countries with an overall score of 2.58 (out of 5) compared to 2.81 for Kazakhstan (71st), 2.55 for the Kyrgyz Republic (108th), 2.41 for Turkmenistan (126th) and 2.34 for Tajikistan (134th). Its infrastructure (2.57), logistics competence (2.59), tracking and tracing (2.71) and timeliness (3.09) scores are considerably better than its score on customs (2.10) (ITF, 2019[28]).

Uzbekistan's planned and currently under construction transport infrastructure projects consist primarily of railway projects, which account for 71% of a total of USD 8.3 billion of investments in the transport sector (see Figure 9.7). Road projects account for the remaining 29% or USD 2.4 billion and they focus mainly on rehabilitating regional roads. Most of these projects are brownfield investments driven by regional efforts such as the Central Asia Regional Economic Cooperation Corridors, which are coordinated by Asian Development Bank and where co-financiers such as the World Bank and China's Export-Import Bank (EXIM Bank) are also actively involved in financing parts of the regional roads. The government is also co-investing in roads and rail projects. Its state-owned enterprise Uzbek Railways has 50 active investment projects to improve rail infrastructure, expand its network and renew rolling stock (EBRD, 2018[11]).

Figure 9.7. Transport projects in Uzbekistan by sub-sector

In USD million



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

Transport infrastructure projects, planned and under construction, are expected to generate significant economic spillovers. In particular, these projects aim at reducing the cost of trade and reducing travel times, improving safety and boost domestic and cross-border trade (Table 9.2). One of the most significant projects currently under construction but nearing completion is the Pap-Angren Rail Project. The rail line, which began transporting passengers and cargo in 2016, connects Ferghana Valley to the rest of Uzbekistan through a single track rail link between Angren and Pap, but electrification and other improvements are ongoing to cope with unexpectedly large demand for the new route (World Bank, 2019[35]). The Valley is the most densely populated part of Central Asia, but in the Uzbek part of the Valley economic growth is much lower than in the rest of the country. For instance, in 2017, the GDP per capita of the three Uzbekistan provinces in the Ferghana Valley (Andizhan, Ferghana and Namangan) were below the average for Uzbekistan by 38, 41 and 49% respectively (The State Committee of the Republic of Uzbekistan on Statistics, n.d.[36]). This project is of high priority for the government: it would change the logistics activities in Uzbekistan by reducing transport costs and improving reliability of a network that is essential for trade and high value exports. Connectivity with Kazakhstan, China, Russia and Europe will improve. The total cost of the project amounts to USD 1.6 billion and it is being financed by the World Bank, China Export Import Bank and the Government of Uzbekistan (World Bank, 2019[37]).

Among the most significant planned projects is the China-Kyrgyz Republic-Uzbekistan railway, which will connect the three countries and is expected to reduce the distance from China to Europe by 900 km. If eventually completed, the project will shorten the transport time for rail shipments between China and the Middle East by seven-eight days (from about 17 days between Shanghai and Dubai currently) and will generate new logistics services such as transhipment along the railway (Emerging Markets Forum, 2019[38]). The share of rail use is expected to increase to over 50% by 2030, but then

drop again below 20% by 2050 when alternative routes from China via other countries come online (ITF, 2019[28]).

Table 9.2. Hotspot projects in the transport sector in Uzbekistan

(a) Under construction					
Name	Sub-sector	Description	Project value (USD million)	Financing source	Type of investment
Pap-Angren Railway	Railways	The new 124 km Pap-Angren Railway connects three provinces in Fergana Valley with the rest of the country bypassing Tajikistan, and both passenger and cargo service along the line began in 2016, but the electrification of the railway is still under construction. The project will reduce – and already has reduced – transport costs and increase transport capacity and reliability. The project's revised closing date is 2020.	1 633	World Bank; China Export-Import Bank; Government of Uzbekistan	Greenfield
Two railways tunnels in Kamchiq Dovon	Railways	The project will finance the construction of two tunnels through Kamchik pass on a railway linking eastern Uzbekistan to the rest of the country, and which bypasses Tajikistan.	400	Loan from Unspecified Chinese Government Institution, Government Agency	N/A
Kashkadarya Regional Road Project	Roads	The project aims to refurbish a 77 km stretch of road between Karshi and Kitab on the A380 and M39 highways. It will include pilot roadside infrastructure development and install cross-border scanning equipment. Construction started in 2017.	266	ADB; Government of Uzbekistan	Brownfield
Second Central Asia Regional Economic Cooperation Corridor 2 Road Investment Program - Tranche 2	Roads	The project will expand a 75 km section of two-lane highway between Pungan and Namangan by adding two additional lanes. Construction started in 2017.	265	ADB; Government of Uzbekistan	Brownfield
Regional Roads Development Project	Roads	The project aims to reduce road user costs and develop a sustainable investment program for regional road asset management. It includes, among others, rehabilitation works of existing regional roads. It will improve about 300 km of priority regional roads in Tashkent, Ferghana, Andijan and Namangan. Construction started in 2015.	400	World Bank	Brownfield
(b) Planned					
Name	Sub-sector	Description	Project value (USD million)	Financing source	Type of investment
China-Kyrgyz Republic-Uzbekistan Railway	Railway	Railway line connecting China, the Kyrgyz Republic and Uzbekistan. The railway has the potential to reduce the distance by rail from China to Europe by 900km, compared to existing routes through Russia and Kazakhstan. The railway is expected to link Uzbekistan's economy to new markets beyond Central Asia. Planning started in 2013.	2 500	N/A	Greenfield

Third CAREC Corridor Road Investment Program	Road	The project will boost domestic and international trade along Central Asia Regional Economic Cooperation (CAREC) Corridors by constructing 365 km of road. Planning started in 2015.	345	ADB; Government of Uzbekistan	N/A
Bukhara-Urgench-Khiva Railway Electrification Project	Railway	The project will improve connectivity of the railway network between the cities of Bukhara, Urgench and Khiva in western Uzbekistan. It will reduce travel times and increase the freight handling capabilities of the rail connections. Planning started in 2018.	339	AIIB; Government of Uzbekistan	Brownfield
Kashkadarya M-39 Road (29KM)	Road	The project entails the reconstruction of the M-39 road, which is part of Karshi-Shakhrisabz-Kitab highway in Kashkadarya region, Uzbekistan. Planning started in 2018.	266	Government of Uzbekistan (100%)	Brownfield
Kashkadarya 4P-79 Road (36KM)	Road	The project will reconstruct and widen from km28 to km64 the 4P-79 Road, which is part of Karshi-Shakhrisabz-Kitab highway in Kashkadarya region, Uzbekistan. Planning started in 2018.	266	Government of Uzbekistan (100%)	Brownfield

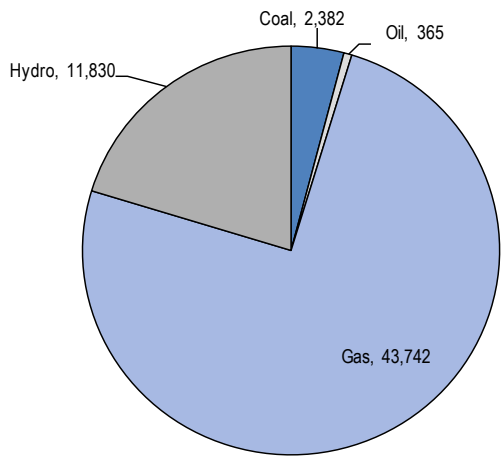
Note: Refer to the Preamble for the present report's definition of 'hotspot' and other information on how the projects above were selected and prioritised.
Source: OECD analysis based on accessed data from ADB (2019[39]), AIDDATA (2019[40]), IJGlobal (2019[41]), CSIS (2019[42]) and World Bank (2019[43]) as of April 2019.

Energy

Uzbekistan is one of the most energy- and carbon-intensive countries in the world. To produce one unit of GDP, Uzbekistan uses 60% more energy than Azerbaijan or Kazakhstan and four times as much as the world average. Such challenges in the energy sector are due to several factors, including old energy infrastructure, low technological base, a lack of investments, inefficiency and high energy subsidies. The economy relies heavily on natural gas, which in 2016 represented 87% of total primary energy supply and 75% (or 43.7 GWh) of electricity generation, while hydroelectric dams (20%), coal-fired (4%) and oil-fired power plants (1%) accounted for the rest (see Figure 9.8). Such heavy reliance on natural gas and limited diversification poses concern for the country's energy security and possible vulnerability to long-term challenges of climate change. As the government is pursuing an industrial growth and export-led development strategy, the sustainability of the power sector will be critical to support Uzbekistan's development vision (ADB, 2010[44]).

Figure 9.8. Electricity generation in Uzbekistan by fuel

GWh, 2016



Source: IEA (2018[45]), *IEA World Energy Balances 2018*, International Energy Agency, https://webstore.iea.org/world-energy-balances-2018

Currently, a significant share of generation capacity in Uzbekistan is old and in need of modernisation or replacement. According to the World Bank, almost 40% of Uzbekistan's available generation capacity is past service life (World Bank, 2016[29]). This has led to worsening of electricity supply reliability, which remained a top obstacle for firm performance in Uzbekistan, leading to an increase in the loss of revenue due to power outages from 8.9% to 16% in 2015. Power outages occur in Uzbekistan almost six times a month on average as of 2013, considerably higher than in the OECD (0.6 per month on average) or the Russian Federation (0.3 per month on average) (World Bank, 2019[1]).

Uzbekistan is a net exporter of energy. In 2016, it exported slightly more coal, oil and electricity than it imported (0.04 Mtoe, 0.16 Mtoe and 0.13 Mtoe respectively). Its natural gas exports were considerably larger: 13.10 Mtoe in 2016 (IEA, 2018[45]). Uzbekistan extracted 806 thousand tonnes of crude oil and 56.4 billion m^3 of natural gas in 2017. Although coal is not a major part of the country's energy mix, Uzbekistan has active coal mines that produced 4 million tonnes of coal in 2017 (National Statistics Committee of the Republic of Uzbekistan, 2017[46]).

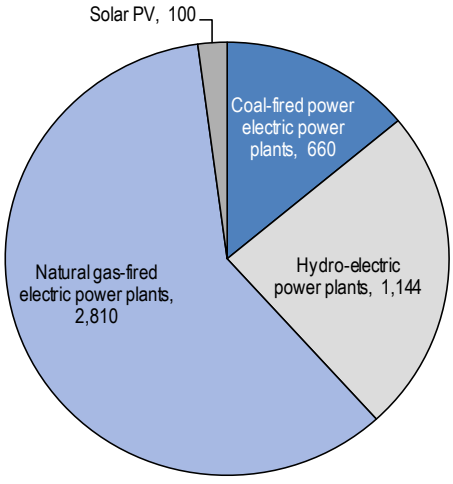
Uzbekistan has striven to support the development of renewable energy resources, particularly solar, since 2016 in an effort to diversify its energy balance and reduce its dependence on gas. In *Action Strategy on Five Priority Directions 2017-2021*, Uzbekistan identifies the increased use of renewable energy sources as an important component of improving high-quality energy access to the country's population. The country's current investments in electricity generation, however, continue to focus primarily on fossil fuel-fired power plants. Around 60% (or 2.8 GW) of planned and under construction power generation projects are natural gas-fired electric power plants (see Figure 9.9) out of a total of 4.7 GW. Hydro-power projects make up a further 24%, while coal-fired thermal power plants and solar PV account for 14% and 2% respectively. While some solar power projects feature among the country's planned

infrastructure projects and will contribute to increasing renewable energy generation, they are dwarfed by investments in natural gas- and coal-fired power plants.

Like all other former Soviet Union countries, Uzbekistan has achieved universal access to electricity. The quality of Uzbekistan's transmission and distribution systems is relatively good. Around 8.8% of electric power is lost, which is in line with or less than in some OECD countries (e.g. Canada 8.7%, Latvia 9.0%, Spain 9.6%, the United Kingdom 8.4%) (World Bank, 2019[1]).

Figure 9.9. Electricity generation projects in Uzbekistan, by fuel

Planned and under construction in Megawatts



Source: OECD analysis based on accessed databases as of April 2019

Uzbekistan's major energy infrastructure projects (see Table 9.3) do not demonstrate momentum for change towards a greener energy mix in line with the government's stated energy-related goals. Most of the projects are upstream oil and gas, oil and gas pipelines, while little investments go into renewables. Uzbekistan is participating in the Central-Asia Gas Pipeline, which has an estimated cost of USD 3.5 billion for Uzbekistan out of a total of USD 11 billion. This project has enabled Uzbekistan to export natural gas to China and generate transit income for Uzbekistan. The project is considered as a Belt and Road (BRI) project although construction of the first two stages had been already completed before the launch of the BRI. Under the BRI umbrella, Uzbekistan's gas fields are also developed by China under production sharing agreements (Emerging Markets Forum, 2019[38]).

One major planned high-impact energy project is the coal- and gas-fired power plant planned in the Tashkent region, which will have a capacity of 600 MW. The Yildirim Group, a Turkish company, is the project's foreign creditor.

Table 9.3. Hotspot projects in the energy sector in Uzbekistan

(a) Under construction						
Name	Subsector	Description	Project value (USD million)	Capacity, if applicable (MW)	Funding source	Type of investment
Uzbekiston Mustaqilligi	Upstream oil and gas	The project involves additional exploration and development of Mustaqillikning field. In Stage I it will process 5 billion m3 of natural gas (2018-2022); In stage II it will produce 500 thousand tons of polymer products (2023-2025).	5 800	N/A	Russia	Greenfield
Project to increase hydrocarbon production for 2017-2021	Upstream oil and gas	The project entails the construction and repair of wells, field facilities, etc., to USD 1 billion)	3 908	N/A	Russia	Greenfield
Central Asia Gas Pipeline (Uzbekistan Section)	Oil and gas pipelines	The fourth line, Line D, is expected to be completed in 2020. It will run 1 000 km from Turkmenistan to China via Uzbekistan, Tajikistan and the Kyrgyz Republic	3 500	N/A	Project finance	Greenfield
Turakurgan Combined Cycle Power Plant Block I and II	Natural gas-fired electric power plants	The project is located 280 km east of Tashkent. The total installed capacity of the plant is 900 MW: two blocks with 450 MW installed power.	1 200	900	JICA; UFRD; Uzbenegro	Greenfield
(b) Planned						
Name	Subsector	Description	Project value (USD million)	Capacity, if applicable (MW)	Funding source	Type of investment
Construction of a coal and gas power plant in Tashkent Region	Coal and natural gas-fired electric power plant	The project involves the construction of a coal and gas power plant in Tashkent Region using Public-Private Partnerships.	1 200	600	Yildirim Group (Turkey)	Greenfield
Pskem Hydropower plant	Hydro-electric power plant	The plant is expected to produce 900 million kilowatt hours of electricity per year, making it the second largest hydro plant in the country.	800	400	Export-Import Bank of China	Greenfield
Navoi Thermal Power Station Modernisation Project	Natural-gas fired electric power plants	The objective of the project is to increase power and heat supply	316	N/A	Japan	Brownfield
Sustainable Energy Access – Distribution Network Modernization Program	Electric power transmission and distribution	The project promotes sustainable use of electricity in in remote areas of Uzbekistan through modernisation of the distribution networks and improved reliability of access to electricity.	300	N/A	ADB	Brownfield

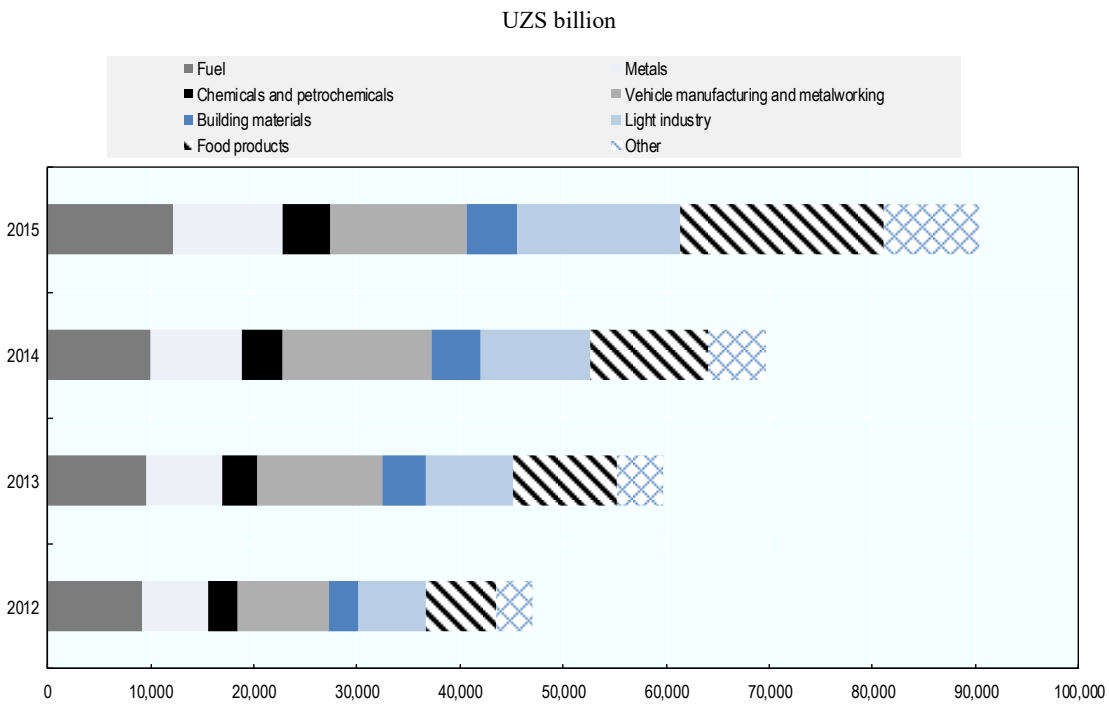
Note: Refer to the Preamble for the present report's definition of 'hotspot' and other information on how the projects above were selected and prioritised. ADB = Asian Development Bank; JICA = Japan International Cooperation Agency; UFRD = Uzbekistan Fund for Reconstruction and Development.
Source: OECD analysis based on accessed data from IJGlobal (2019[41]), Government of Uzbekistan (2019[47]), Dealogic (2019[48]), HydroWorld (2019[49]), OECD (2019[50]) ADB (2019[39]), CSIS (2019[42])

Industry and mining

Uzbekistan has one of the most diversified economies in Central Asia. Its industry sector has traditionally been focused on energy, metals, food processing and construction. Uzbekistan's industrial production has been steadily increasing in recent years (see Figure 9.10), particularly in light industry (textiles, clothing), food products and vehicle manufacturing. In 2015, the government announced a programme of structural reform, modernisation and diversification of industry. Economic diversification and moving up the value chains towards high-tech industries is also one of its main priorities in its *Action Strategy on Five Priority Directions 2017-2021*.Yet, the reality is that there is little price or exchange rate liberalisation, limited privatisation and enterprise restructuring, and a weak banking system.

The industry sector is also one of the largest sources of energy inefficiency and the largest consumer of electricity, partially due to lack of awareness about energy-efficient technologies. According to the World Bank, Uzbekistan's energy use per unit of GDP is very high: It is 6 times larger than the EU-27 average (Kochnakyan et al., 2013[51]). The most energy intensive industries in Uzbekistan are the metallurgy, construction material manufacturing such as cement, the chemical industry, and mining. Such industries use old and energy-inefficient technology, but they are also not aware energy efficient technologies and the potential benefits from investing in those technologies.

Figure 9.10. Industrial production of Uzbekistan, 2012-2015



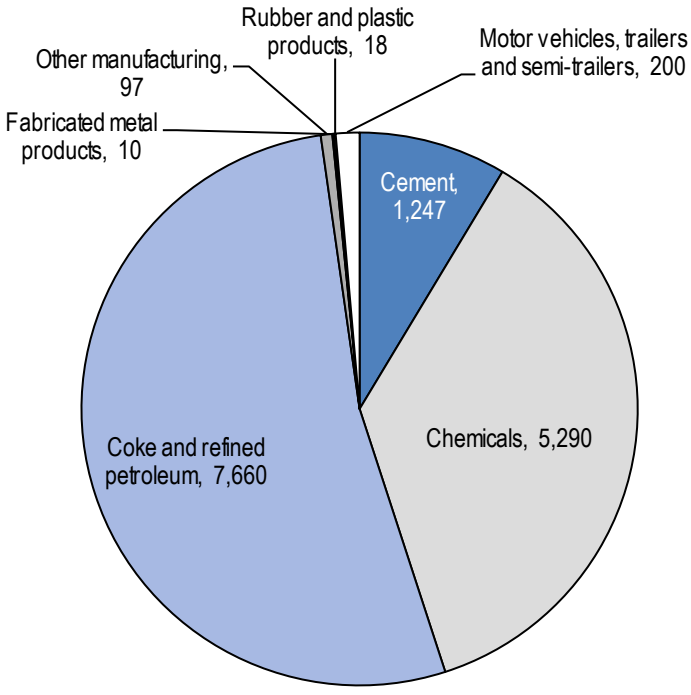
Note: UZS = Uzbek so'm. USZ 1 million equals approximately USD 118.
Source: National Statistics Committee of the Republic of Uzbekistan (2017[52]), Промышленная продукция [Industrial Production], National Statistics Committee of the Republic of Uzbekistan, https://stat.uz/ru/otkrytye-dannye/ekonomika.

Uzbekistan is one of the biggest manufacturers of cement in Central Asia with 9 large facilities capable of producing over 7.6 Mt per year. The industry is also supported by a

1 Mt per year grinding facility in Tashkent (Strommashina, n.d.[53]). More than half (53% or USD 7.6 billion) of the manufacturing projects under construction and planned are in coke and refined petroleum sector, followed chemicals (36%) and cement (9%) (see Figure 9.11). Projects in the chemical sectors include a large petrochemical and natural gas complex, a large chemical plant in Uzbekistan and the construction of a metallurgical plant. Uzbekistan ranks 96th out of 125 in the Economic Complexity Rankings, making it significantly exposed to external shocks due to insufficient diversification and complexity of products (EBRD, 2018[11]).

Figure 9.11. Industry projects in Uzbekistan, by sub-sector

Planne and under construction in USD million



Source: IJGlobal (2019[41]); Dealogic (2019[48]); The Export-Import Bank of China (2019[54]), Government of Uzbekistan (2019[47]), AIDDATA (2019[40]) based on information accessed as of May 2019.

Most of the manufacturing projects under construction and planned are also related to chemicals, coke and refined petroleum, and cement manufacturing (Table 9.4). Some of these projects are very large such as the Surgil Petrochemical and Natural Gas Complex, a USD 4 billion project financed jointly by Uzbekneftegaz, Lotte Chemical Corporation, Korea Gas Corporation and STX, which aims to supply 4.5 billion cubic meters of gas and is anticipated to have a production life of 40 years. The government also plans to double the volume of cement production to 17 million tons per year in order to meet the growing domestic and regional demand (Strommashina, n.d.[53]). Major high-impact projects include the construction of a cement plant in Karauzak District, as well as the Surxondaryo and Akhangaran Cement Factories producing a total of 4 million tons of cement per year.

Table 9.4. Hotspot projects in the industry sector in Uzbekistan

Name	Sub-sector	Description	Project value (USD million)	Funding source	Type of investment
Surgil Petrochemical and Natural Gas Complex	Chemicals	The project is located in the Usyurt region and aims to supply 4.5 billion cubic metres of gas per year as well as to construct feedstock delivery infrastructure, a gas separation plant and a petrochemical complex. The Field is anticipated to have a production life of approximately 40 years.	4 000	Uzbekneftegaz (50%), Lotte Chemical Corporation (22.5%), Korea Gas Corporation (22.5%), STX (5%)	Greenfield
Uzbekistan gas-to-liquids project	Coke and refined petroleum	Based in northern Uzbekistan, the plant will have a production capacity of 1.3 million tonnes of petroleum products (diesel, kerosene, naphtha and liquefied petroleum gas).	3 600	UFRD, China, Republic of Korea, , Uzbekneftegaz	Greenfield
Construction of Tashkent metallurgical plant	Chemicals	The project is located in Tashkent Region and is expected to produce 500 thousand tonnes production per year.	335	Metallurgical Technology and Engineering BV (the Netherlands)	Greenfield
Mass production of Hyundai cars with Evergreen Motors company	Motor vehicles, trailers and semi-trailers	The project is located in the Namangan Region and is expected to be completed in 2021.	200	Korea Evergreen Motors	Greenfield
Construction of a cement plant in Kashkadarya region	Cement	The project is developed through foreign direct investment and is expected to reach a capacity of 2 million tonnes.	200	Anhui Conch Cement (China)	Greenfield
(b) Planned					
Name	Sub-sector	Description	Project value (USD million)	Funding source	Type of investment
Gas-to-liquid (GLT) plant	Coke and refined petroleum	The plant is expected to be commissioned in 2020 and will provide annual import substitution of petroleum products in the amount of up to 1.5 million tonnes worth over USD 1 billion.	1 200	CDB	Greenfield
Large Chemical Plant in Uzbekistan	Chemical	Chinese companies to build large chemical complex in Uzbekistan	374	China Export-Import Bank	Greenfield
Construction of cement plant in Karauzak District	Cement	The project involves the construction of a new cement plant with a capacity of 1.5 million tonnes of cement per year in Karauzak district.	213	China; Kazakhstan	Greenfield
Surxondaryo Cement Factory	Cement	As one of the largest factories for the production of portland cement in Central Asia, it will produce 1.5 million tonnes of cement per year.	213	China; Kazakhstan	Greenfield

Akhangaran Cement Factory	Cement	The factory will be built in the Akhangaran region and will have an annual capacity of 1 million tonnes of cement.	108	Xin Lei Enterprise (China)	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; UFRD = Uzbekistan Fund for Reconstruction and Development
Source: OECD analysis based on accessed data from the Export-Import Bank of China (2019[54]), Trend News Agency (2019[55]), IJGlobal (2019[41]), Dealogic (2019[48]), Government of Uzbekistan (2019[47]), AIDDATA (2019[40]) based on accessed data as of May 2019.

Water

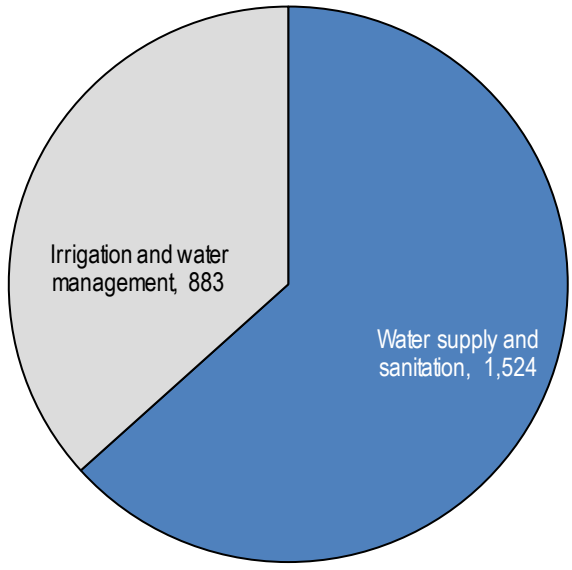
The water supply and sanitation system in Uzbekistan was inherited from the Soviet Union and has reached the end of its economic life, requiring extensive rehabilitation. The sector is faced with a series of issues, including deteriorated infrastructure, outdated sector strategy and planning, inappropriate standards, limited financial resources, and weak institutional capacity. Currently, over 30% of households do not have quality drinking water, and over 1 000 settlements have no drinking water at all (WHO, 2019[56]). Providing safe and affordable water and supply services for the population is therefore proving a key challenge for the government. The government has made access to safe water and sanitation a priority in its *Poverty Reduction and Welfare Improvement Strategy*. The objective of this strategy is to reach within the next decade 100% service coverage in urban areas and 85% in rural areas. To achieve such targets, the government has a sector investment plan amounting to USD 2.9 billion by 2020.

The water challenge also makes the economy vulnerable to the impacts of climate change, particularly in the agricultural sector, which is by far the largest use of water (EBRD, 2018[11]). Water is particularly important for cotton cultivation, which requires significant amounts of irrigation water, pesticides and fertilisers. Uzbekistan scores among the lowest five countries in the world (2nd percentile) in water productivity. This is partly due to the old Law on Water and Water Use from 1993, which has been amended several times and includes provisions like water charges and basin administration but needs updating.

There are more than USD 2.4 billion of planned and currently under construction water projects, with over 63% in water supply and sanitation and the remaining 37% in irrigation and water management (see Figure 9.12). All these projects are financed with support from multilateral development banks such as the ADB, EBRD, EIB and the World Bank. Water irrigation projects receive a relatively higher share of funding compared to water supply and sanitation projects. For example, the South Karakalpakstan Water Resource Management Project has a cost of over USD 522 million and it expected to improve the irrigation network so that a large number of farmers in the area can take advantage of improved irrigated agricultural production (World Bank, 2019[57]).

Figure 9.12. Water projects in Uzbekistan

Planned and under construction in USD million



Note: Water projects include water supply and sanitation projects as well as irrigation systems and rehabilitation projects.
Source: ADB (2019[39]), EIB (2019[58]), EBRD (n.d.[59]), World Bank (2019[43]), OFID (2019[60]), OECD (2019[50]).

9.3. 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

Uzbekistan has adopted and implemented a 5-year development strategy, the *Action Strategy on Five Priority Directions for the Development of the Republic of Uzbekistan 2017-2021*, in addition to which each year the government publishes a 'government programme' contributing to these five policy directions (for a full list of Uzbekistan's strategic documents, see Table 9.5). The strategy clearly defines which government agencies are responsible for which goals, but several of the policy goals refer to indices that do not serve as useful benchmarks. For instance, the index selected for infrastructure (the Global Competitiveness Index) has never included data on Uzbekistan and therefore the government's goal to improve Uzbekistan's ranking is not actionable since there is no previous ranking against which to compare.

While the Action Strategy set out a clear vision for Uzbekistan's overall development to 2021, Uzbekistan has not yet formally adopted a longer-term economy-wide development strategy to articulate its plans further in the future. Uzbekistan has laid out its vision for sectoral development beyond 2021 in the transport sector (*Strategy for the Development of the Transport System until 2035*), the energy sector (*Concept of*

Development of the Hydropower Industry 2020-2024) and specific industries (*Concept of Development of the Textile, Garment and Knitwear Industry 2020-2024*), but a coherent development plan beyond 2021 has not yet been adopted.

In 2018, Buyuk Kelajak, a non-governmental organisation with an Expert Council composed of 240 experts with experience working abroad in over 30 countries, developed a long-term strategy, *Uzbekistan 2035*, but the government does not formally recognise any of its objectives or key performance indicators.

Uzbekistan 2035 contains ambitious targets on energy provision (including renewables and connectivity), transport (including electric cars and regional connectivity) and environmental protection (including the creation of a committee dedicated to carrying out analysis on environmental impacts and risks of infrastructure projects) and defines budgets and timelines for each step in the sectoral roadmaps. Although it lacks government buy-in and endorsement, the collaborative approach to elaborating *Uzbekistan 2035* and its clear, quantitative targets and step-by-step roadmaps could serve as a good example for the development of official strategies in the future.

Institutional set-up and decision-making processes

Uzbekistan devised a well-structured system for coordinating the implementation of its *Action Strategy 2017-2021*. It created dedicated coordinating commissions for the implementation of the strategy as a whole (consisting of the President, his advisors and the Prime Minister) and one for each of the Strategy's five priority areas: governance, rule of law, economic liberalisation and development, 'social reforms' (which include infrastructure development goals) and security. The President's advisors chair the five lower-level commissions and report back on their priority area's implementation to the broader committee.

The commissions on the five priority areas vary in size from 21 members (on foreign policy) and security to the much more unwieldy number of 51 (on economic development and liberalisation). They include relevant line ministries (the Ministry of Transport, Ministry of Energy and Ministry of Economy and Industry all have representatives in the infrastructure-related committee) as well as representatives of the private sector, state-owned enterprises, government academies and civil society organisations.

The State Committee on Ecology and Nature Protection has representatives in two coordinating commissions (security and economic development and liberalisation). However, it is not included in the commission relating to 'social reforms', despite its sizeable infrastructure component. Without a representative on environmental protection, the coordinating commission may not effectively integrate environmental and climate concerns into the high-level planning for the implementation of the strategy's infrastructure development goals.

The Uzbekistan government has also established ministries dedicated to the transport and energy sectors. The Ministry of Transport was created from the Uzbek Agency of Automobile Transport as well as other transport-related bodies (News of Uzbekistan, 2019[61]), and the Ministry of Energy was conceived through merging Uzbekenergo, Uzbekneftegaz (in charge of oil and gas) and Uzbekgidroenergo (in charge of hydroelectricity) (The Tashkent Times, 2019[62]).

List of relevant strategic documents

Table 9.5. Main strategic documents in force

	Status	Time Horizon	Sectoral Coverage	Main objectives
First Nationally Determined Contribution (NDC)	Submitted in 2018	2018-2030	Economy-wide	• Unconditional/Conditional target: decrease greenhouse gas emissions (specifically CO_2, CH_4, N_2O) per unit of GDP by 10% by 2030 from 2010 levels • Main sectors for emission reduction: Energy sector (development of renewable energy sources, decrease losses in natural gas seepage), Industry sector (modernisation and technical upgrading of industrial facilities), Transport (ensure the extension of transport and logistics communication systems) • Adaptation priorities: mitigation of Aral Sea disaster, adaptation of agriculture and water management sector, adaptation of social sector to climate change, adaptation of strategic infrastructure and production facilities (strategic documents listed below help achieve these priorities)
Action Strategy on Five Priority Directions for the Development of the Republic of Uzbekistan 2017-2021	Adopted in 2017	2017-2021	Governance, Transport, Energy, Industry, Water	• Increase the effectiveness and transparency of government bodies (e.g. implementation of a new 'e-government' system) • Ensure a high GDP growth rate by maintaining a macroeconomic balance • Develop policies that encourage local production and boost inter-sectoral industrial • Diversify the structure and geography of exports • Encourage the growth of the private sector by creating a favourable business environment • Ensure the efficient use of natural, mineral-raw and industrial resources • Construct and develop new modern electricity generating capacities • Further develop road transport infrastructure • Improve the provision of water supply, especially in rural areas, through the use of modern and efficient technologies
Strategy of the Investment Policy of the Republic of Uzbekistan until 2025	Adopted in 2019	2019-2025	Governance	• Improve the investment climate • Enhance domestic sources of investment and ensure the efficient use of investment resources • Develop new approaches to attract foreign investment
Strategy for the Development of the Transport System of the Republic of Uzbekistan until 2035	Adopted in 2019	2019-2035	Transport	• Meet the demand of the population for high-quality transport services • Develop transport corridors on a national scale in turn allowing for better interconnectedness in the region • Actively introduce new technologies and promote innovation in the transport sector • Ensure equal access to transport infrastructure and services for the population and businesses, regardless of the geographical location

Strategy of the Republic of Uzbekistan for the Transition to a Green Economy	Adopted in 2019	No defined timeframe	Governance, Energy	• Ensure stable economic progress with minimal greenhouse gas emissions • Increase the effectiveness of energy production and use by using modern technology • Ensure the rational use of natural resources • Introduce environmentally friendly criteria for the acceptance of investments
Concept of Development of the Hydropower Industry of the Republic of Uzbekistan for 2020-2024	Adopted in 2019	2020-2024	Energy, Water	• Rehabilitate existing hydropower plants and construct new plants based on modern technology • Preserve the flora and fauna during construction • Ensure the effective use and management of water resources
Concept of Development of the Textile and Garment and Knitwear industry for 2020-2024	Adopted in 2019	2020-2024	Industry	• Expand production capacity of the textile industry • Increase industrial production by 4.6 times • Increase production of finished fabrics by 3.1 times, knitted fabric by 4.3 times, garment and knitwear by 3.7 times and hosiery by 2.6 times

Table 9.6. Other relevant documents

	Status	Time Horizon	Sectoral Coverage
Poverty Reduction and Welfare Improvement Strategy for 2008-2010	Adopted in 2007	2008-2010	Multi-sector
Programme for Environmental Protection and the Rational Use of Natural Resources for 1999-2005	Adopted in 1999	1999-2005	Multi-sector
Programme of Actions on Nature Protection for 2008-2012	Adopted in 2008	2008-2012	Multi-sector
Privatisation Programme for 2007-2010	Adopted in 2007	2007-2010	Industry
National Programme on the Development of Irrigation for 2000-2005	Adopted in 2000	2000-2005	Water
State Programme on Providing the Rural Population with Drinking Water and Natural Gas	Adopted in 2000	2000-2010	Water, Energy
Concept of Development of Nuclear Energy in the Republic of Uzbekistan for the period 2019-2029	Proposed, not adopted	2019-2029	Energy

Notes

[i] Uzbekistan is the world's second largest cotton producer after the United States.

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Annex A. Overview of selected sustainable infrastructure standards and norms

This annex provides an initial stocktake of sustainable infrastructure initiatives, to raise awareness amongst policy-makers, infrastructure planners and decision-makers on the variety of tools, instruments and techniques 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. This annex is by no means comprehensive, but aims to showcase the variety of tools and instruments available to governments for integrating sustainability into infrastructure decision-making. It also shows that there is no one-size-fits-all solution, and it is essential to tailor instruments to the specificities of each country, including institutional capacity. Navigating the complexity of international standards and norms requires targeted technical assistance and capacity-building programmes, in line with the specific needs and capacity of recipient countries.

1. The need for sustainable infrastructure definitions, standards and tools

Sustainable infrastructure is central to achieving the Sustainable Development Goals (SDGs) and the climate objectives of the Paris Agreement, given that current infrastructure systems account for more than 60% of global GHG emissions. Although infrastructure is only explicitly mentioned in SDG 9, it underlies all of the other socio-economic SDGs (Thacker et al., 2018[1]). Helping countries mainstream social and environmental benefits in infrastructure planning will bring multiple co-benefits to health and air quality through clean transport systems (SDG 3), access to energy (SDG 7), sustainable industrialisation (SDG 9) and responsible production and consumption (SDG 12). Sustainable infrastructure could also contribute to protecting and promoting sustainable use of terrestrial ecosystems (SDG 15), and better planned transport infrastructure and improved connectivity could reduce inequalities within countries (SDG 10).

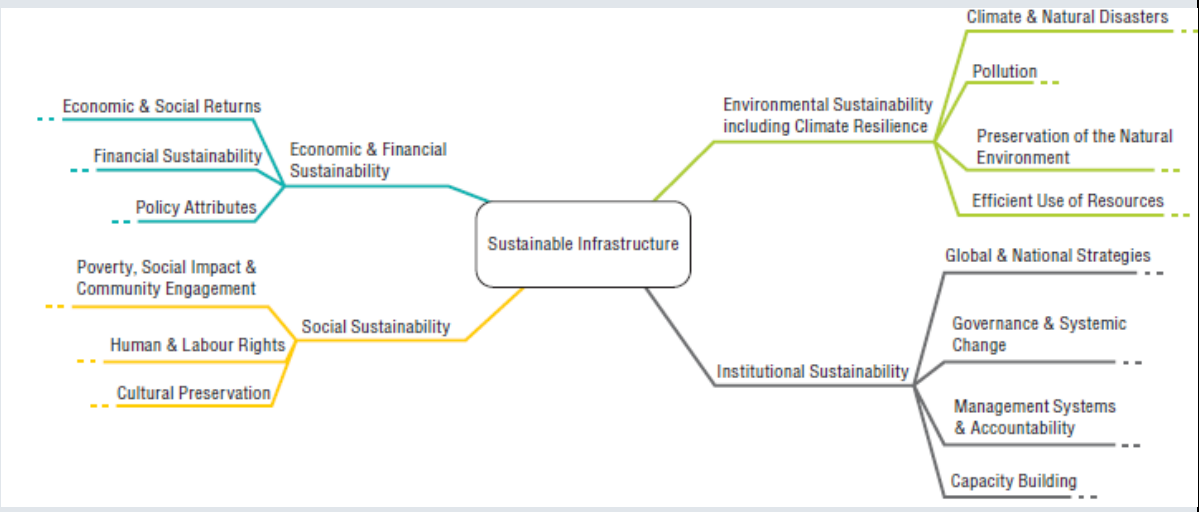
The types of infrastructure selected for construction have both direct and indirect impacts on the environment and wellbeing. Since infrastructure assets are typically designed to last for decades, infrastructure's impacts are long lasting and have the potential to lock countries into unsustainable development pathways, for instance due to higher rates of greenhouse gas emissions and insufficient resilience to climatic and other catastrophic events. Countries must avoid investments that lock in carbon-intensive and resource-inefficient infrastructure and technology, and instead focus on investments in green infrastructure, clean energy, clean technology, and human and natural capital. They must also ensure that infrastructure investments generate positive social outcomes, benefit the poor, leave no one behind, and respect human rights (UN Environment, 2019[2]). Risks to the environmental, social, economic, financial as well as institutional sustainability of infrastructure need to be considered during all phases of infrastructure planning, and in particular during up-stream, macro-level strategic infrastructure planning.

In the context of the 2030 Agenda for Sustainable Development, there are many estimates of expected infrastructure investment needs. The OECD estimates that an annual average of USD 6.9 trillion in infrastructure investment until 2030 is required to support global development (OECD, 2018[3]). The bulk of this investment is needed in developing countries, which face strong population growth, rising income levels and rapid urbanisation as well as global trends such as growing inequality and climate change. To date, countries have mainly focused on closing the infrastructure finance and investment gap, with limited attention to environmental and societal problems in the planning and construction of such projects, leading to only incremental policy approaches to climate, infrastructure and finance (OECD/World Bank/UN Environment, 2018[4]). However, investing now in a decisive transition, including in sustainable infrastructure, could increase long-term GDP by 2.8%, while also providing potential growth benefits in the short-term. It is therefore critical that infrastructure investment decisions over the next five years shift investment flows towards low-carbon, climate-resilient infrastructure to achieve the scale of investment needed to meet sustainability and growth demands.

Balancing the socio-economic and environmental aspects of infrastructure has proven challenging for countries. Analytical tools such as Cost-Benefits Analysis (CBAs) and Environmental and Social Impact Assessments (ESIA) have been implemented and used at the project levels, although not systematically. Additionally, several barriers still prevent investment in sustainable infrastructure including the absence of articulated visions, long-term low-emission development strategies or investment roadmaps, a lack of transparent pipelines of bankable sustainable infrastructure projects and a lack of shared definitions (see box xxx) and standards of sustainability. Mainstreaming climate and development considerations in investment decisions and strategies is needed and requires action on multiple fronts, from upstream sustainable infrastructure planning to project prioritisation, financing and delivery (IDB, 2018[5]).

Box A.1. Defining sustainable infrastructure

Infrastructure is sustainable if, throughout its life cycle (i.e. from the planning stages throughout its operation and until decommissioning), it provides social, economic and environmental benefits, but no single, harmonised definition of sustainable infrastructure exists (IDB, 2018[5]). A harmonised definition of sustainable infrastructure could ensure consistency of data collection, help project preparation and the development of benchmarks and metrics of success to leverage further private sector investment in sustainable infrastructure. The Inter-American Development Bank developed a framework for sustainable infrastructure that attempts to harmonise existing definitions of sustainable infrastructure, building on the G7 Ise-Shima Principles for Promoting Quality Infrastructure Investment. Such modular definition to sustainability needs to be adjusted to specific country contexts.



Adapted from IDB (2018[5]), *What is Sustainable Infrastructure? A Framework to Guide Sustainability Across the Project Cycle*, Inter-American Development Bank, https://publications.iadb.org/en/what-sustainable-infrastructure-framework-guide-sustainability-across-project-cycle.

2. Navigating the multitude of principles, standards and norms

The challenge for policy-makers today is not so much the lack of tools and instruments to evaluate and mainstream sustainability in infrastructure decision-making, but rather the multitude of sustainable infrastructure standards and tools. There is a plethora of internationally, nationally and locally endorsed definitions, approaches, standards, principles, guidelines and frameworks in place for sustainable infrastructural development. This extensive number of tools and methods can create a sense of confusion, therefore inadvertently hindering the sustainable practices that such standards advocate (IDB, 2018[5]). The tools, rating systems and guidelines created can also place excessive focus on specific aspects of infrastructure development, in turn making it increasingly difficult to decide on which standards to prioritise in order to achieve sustainability. In addition, by striving to achieve comprehensive sustainability, it can often lead to disagreements between various disciplines involved in the planning,

construction and operation of an infrastructure project, and lead to trade-offs between different SDGs.

Therefore, it is imperative to understand the diversity of current sustainable infrastructure standards and involved stakeholders. Several initiatives and papers have striven to fill this knowledge gap. For instance, the *Sustainable Infrastructure Tool Navigator* (n.d.[6]) lists more than 50 rating systems (see Table 2), high-level principles and guidelines to support project teams, public officials and financiers among other stakeholders to integrate sustainability throughout the lifecycle of infrastructure projects. The tool is organised by project phase (see Table 1, stakeholders, types of tools and sectors to facilitate the navigation.

Table A.1. Organisation structure of the Sustainable infrastructure tools navigator

I. Project phase of infrastructure projects	II. Main audience and main users
	• Project team • Developers • Public authorities • General audience • Operators • Investors • Credit rating agencies • Financial institutions • Insurers
III. Type of tools	**IV. Sectors**
• Rating systems • Guidelines • Principles • Financial tools • Global sustainability benchmark • Project preparation software	• Highways • Urban areas, Landscape • All productive sectors • Energy • Transportation • Hydropower • Parking • Waste

Source: Sustainable Infrastructure Tool Navigator (n.d.[6]), https://sustainable-infrastructure-tools.org/

Table A.2. Standards listed in the Sustainable Infrastructure Tool Navigator

Infrastructure project lifecycle stages	Infrastructure sector		
	General	Transport	Energy
1. Prioritisation	SOURCE [https://public.sif-source.org/]	TREDIS [https://tredis.com/]	
	Smart Scan Tool [http://www.gib-foundation.org/smartscan/]		
	Zofnass Economic Process Tool [http://economictool.zofnass.org/]		
	IFCs Environmental and Social Performance Standards [https://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/Sustainability-At-IFC/Policies-Standards/Performance-Standards]		
	GRESB [https://gresb.com/about/]		
	Financial Valuation Tool [https://www.fvtool.com/]		
	Environment and Social Framework [https://www.worldbank.org/en/projects-operations/environmental-and-social-framework]		
2. Planning / preparation	Sustainable Infrastructure Guidelines for Overseas Chinese Enterprises [http://csr2.mofcom.gov.cn/article/policies/ind/201707/20170702608844.shtml]	Greenroads Rating System [https://www.greenroads.org/publications]	Performance Excellence in Energy Renewal-PEER [http://peer.gbci.org/]
	Sustainability Assessment Method for Civil Engineering Works [https://www.fccco.com/en/sustainability/responsible_construction/sustainability-system-assessment]	Sustainable Transportation Analysis and Rating System [https://www.sccrtc.org/wp-content/uploads/2014/02/STARS-Pilot-Project-Application-Manual.pdf]	E0100 Standard for Responsible Energy [https://www.equitableorigin.org/eo100-for-responsible-energy/overview/]
	SURE Standard [http://www.gib-foundation.org/sure-standard/]	TREDIS [https://tredis.com/]	
		BE2ST-in-Highways [http://rmrc.wisc.edu/be2st-in-highways/]	
3. Procurement	GRESB [https://gresb.com/about/]	TREDIS [https://tredis.com/]	

	Zofnass Economic Process Tool [http://economictool.zofnass.org/]		Performance Excellence in Energy Renewal-PEER [http://peer.gbci.org/]
4. Detailed Design	Sustainable Infrastructure Guidelines for Overseas Chinese Enterprises [http://csr2.mofcom.gov.cn/article/policies/ind/201707/20170702608844.shtml]	Greenroads Rating System [https://www.greenroads.org/publications]	Performance Excellence in Energy Renewal-PEER [http://peer.gbci.org/]
	Sustainability Assessment Method for Civil Engineering Works [https://www.fccco.com/en/sustainability/responsible_construction/sustainability-system-assessment]	Sustainable Transportation Analysis and Rating System [https://www.sccrtc.org/wp-content/uploads/2014/02/STARS-Pilot-Project-Application-Manual.pdf]	Hydropower Sustainability Assessment Protocol [http://www.hydrosustainability.org/]
	Sustainable Asset Valuation (SAVi) [https://www.iisd.org/project/SAVi-sustainable-asset-valuation]	TREDIS [https://tredis.com/]	
	IS Rating Scheme [https://isca.org.au/component/content/article?id=867]	BE2ST-in-Highways [http://rmrc.wisc.edu/be2st-in-highways/]	
5. Finance	Sustainability Bond Guidelines [https://www.icmagroup.org/green-social-and-sustainability-bonds/sustainability-bond-guidelines-sbg/]	TREDIS [https://tredis.com/]	E0100 Standard for Responsible Energy [https://www.equitableorigin.org/eo100-for-responsible-energy/overview/]
	Social Bonds Principles [https://www.icmagroup.org/green-social-and-sustainability-bonds/social-bond-principles-sbp/]		
	Principles for Sustainable Insurance [https://www.unepfi.org/psi/the-principles/]		
	Principles for Responsible Investment [https://www.unpri.org/]		
	Green Bond Principles [https://www.icmagroup.org/green-social-and-sustainability-bonds/green-bond-principles-gbp/]		
	Climate Bond Standards [https://sustainable-infrastructure-tools.org/tools/climate-bonds-standard/]		
	Zofnass Economic Process Tool [http://economictool.zofnass.org/]		
	Financial Valuation Tool [https://www.fvtool.com]		

Source:

6. Construction	Sustainable Infrastructure Guidelines for Overseas Chinese Enterprises [http://csr2.mofcom.gov.cn/article/policies/ind/201707/20170702608844.shtml]	Greenroads Rating System [https://www.greenroads.org/publications]	E0100 Standard for Responsible Energy [https://www.equitableorigin.org/eo100-for-responsible-energy/overview/]
	Sustainability Assessment Method for Civil Engineering Works [https://www.fccco.com/en/sustainability/responsible_construction/sustainability-system-assessment]	Sustainable Transportation Analysis and Rating System [https://www.sccrtc.org/wp-content/uploads/2014/02/STARS-Pilot-Project-Application-Manual.pdf]	Hydropower Sustainability Assessment Protocol [http://www.hydrosustainability.org/]
	Smart Scan Tool [http://www.gib-foundation.org/smartscan/]	TREDIS [https://tredis.com/]	
	IFCs Environmental and Social Performance Standards [https://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/Sustainability-At-IFC/Policies-Standards/Performance-Standards]		
7. Operation / maintenance	True Zero Waste [https://true.gbci.org]	Greenroads Rating System [https://www.greenroads.org/publications]	E0100 Standard for Responsible Energy [https://www.equitableorigin.org/eo100-for-responsible-energy/overview/]
	Sustainable Infrastructure Guidelines for Overseas Chinese Enterprises [http://csr2.mofcom.gov.cn/article/policies/ind/201707/20170702608844.shtml]	TREDIS [https://tredis.com/]	Performance Excellence in Energy Renewal-PEER [http://peer.gbci.org/]
	Sustainability Assessment Method for Civil Engineering Works [https://www.fccco.com/en/sustainability/responsible_construction/sustainability-system-assessment]		
	GRESB [https://gresb.com/about/]		
	Smart Scan Tool [http://www.gib-foundation.org/smartscan/]		

Sustainable Infrastructure Tool Navigator (n.d.[6]), https://sustainable-infrastructure-tools.org/

The Navigator is quite complete but not comprehensive. For instance, it fails to account for some key internationally recognised standards that are not directly related to sustainable infrastructure projects, but that influence the overall policy strategies and environment. The *G20/OECD/WB Stocktake of Tools and Instruments Related to Infrastructure as an Asset Class – Progress Report* (OECD and World Bank, 2018[7]) provides a comprehensive overview of existing infrastructure policy tools, standards and instruments that have received international recognition, typically by G20 or G7 or OECD. The stocktake, undertaken in consultation with various international organisations including ADB, AfDB, AIIB, EBRD, EIB, FSB, IADB, IFC, IMF, IsDB, GI Hub, NDB and UN, is mainly targeted at decision makers and policy makers and is structured around different categories:

A. Policy related tools and instruments,

B. Project related tools and instruments

C. Infrastructure-related data.

The table below provides an overview of a few internationally agreed standards and principles related to sustainable infrastructure mainly targeted at policy-makers that intend to create a policy framework conducive to investment in sustainable infrastructure. The following list is by not comprehensive but provides a good overview of the different OECD instruments with different legal statuses. A few are legally binding for OECD countries and adhering non-members, while others have been endorsed by OECD countries or the G20 but remain "soft" law instruments.

Table A.3. Examples of internationally recognised instruments and standards related to sustainable infrastructure

A. Policy related tools and instruments	
Framework condition	G7 Ise-Shima Principles for Promoting Quality Infrastructure G20 principles for quality infrastructure investment OECD Policy Framework for Investment, adopted by an OECD council recommendation in 2015 to improve investment climate to mobilise private investments, including in quality infrastructure, and to enhance the policy framework. Application to selected sectors such as—Transport infrastructure-Procurement guidelines (ITF) The OECD Principles for Private Sector Participation in Infrastructure, approved by the OECD council in 2007
Financing	G20/OECD High-level Principles of Long-term Investment Financing by Institutional Investors OECD Policy Guidance for Investment in Clean Energy Infrastructure Mapping Channels to Mobilise Institutional Investment in Sustainable Energy Investment governance and the integration of environmental, social and governance factors OECD Investing in Climate, Investing in Growth OECD/ WB/ UNEP Financing Climate Futures: Rethinking Infrastructure
Governance	OECD Framework for the Governance of Infrastructure to plan and prioritise investments, manage PPPs and procurement, design effective regulatory environments and manage integrity risks G20 Compendium of Good Practices for Promoting Integrity and Transparency in Infrastructure Development –focuses on transparency and integrity in the infrastructure cycle. (anti- corruption and fraud) at Appraisal, Planning, Tendering, Implementation & Contract Management, etc. OECD Guidelines for Multinational Enterprises, that integrate **Responsible Business Conduct** (RBC) principles and standards for investments in the infrastructure project life e-cycle for better economic, environmental and social outcomes, avoid political gridlock, and ensure that infrastructure serves public interest G20/OECD Principles of Corporate Governance and OECD Guidelines on Corporate Governance of State-Owned Enterprises Anti-corruption, responsible business conduct and the environment, with the OECD Anti-Bribery Convention, OECD Integrity Framework for Public Investment Open competition in procurement, with the OECD Recommendation of the Council on Public Procurement and OECD Arrangement on Officially Supported Export Credits
Development	United Nations Sustainable Development Goals OECD DAC Blended Finance Principles for Unlocking Commercial Finance for the SDGs
Environment	The 2019 OECD council Recommendation on the Assessment of Projects with Significant Impact on the Environment
B. Project related tools and instruments	
Planning and prioritisation	WBG Infrastructure Prioritisation Framework (IPF) OECD Principles for the Public Governance of Public-Private Partnerships
Institutional capacity for project development	Multi-lateral Development Banks APMG PPP Certification Program WBG Country PPP Readiness Diagnostic
Project preparation	WBG PPP Screening Tool WBG/IMF PPP Fiscal Risk Assessment Model (PFRAM) WBG Project Readiness Assessment WBG Policy Guidelines for Managing Unsolicited Proposals OECD Recommendation on Public Procurement OECD Recommendation on Fighting Bid Rigging in Public Procurement Sustainable Infrastructure Foundation SOURCE UNECE International Specialist Centers UNECE Standard On Zero Tolerance to Corruption
Transaction support and contract management	WBG Framework for Disclosure in PPP Projects WBG Guidance on PPP Contractual Provisions GI Hub Annotated Public-private Partnership Risk Allocation Matrices The GI Hub PPP Contract Management Tool

The experience of OECD countries and the OECD's broad network of policy communities and analytical capacity enables it to address the infrastructure challenge from different policy angles, including investment, finance, governance, and in different sectors as

transport, ICT and clean energy. Such a holistic and high-quality policy-oriented research and dialogue is a distinctive and complementary contribution to those of regional and multilateral development banks.

With a mandate from the OECD Ministers in 2017[4], the OECD is currently taking an integrated, strategic approach to quality infrastructure investments by developing a horizontal project involving 19 OECD directorates and agencies. Some examples of through a horizontal project involving 19 OECD directorates and agencies, covering many disciplines and areas of expertise. Some examples of this work include:

- The OECD Framework for the Governance of Infrastructure is supporting governments to plan and prioritise investments; manage private-public partnerships and procurement; design effective regulatory environments and manage integrity risks.
- The OECD Policy Framework for Investment helps governments to improve their investment climate to mobilise private investments, including in quality infrastructure, and enhance the policy framework to maximise the economic, social and environmental outcomes of such investments.
- Endorsed by the G20 in September, 2016, the G20/OECD Guidance Note on Diversification of Financial Instruments for Infrastructure and SMEs provides key policy and regulatory guidance on mobilising private investment in infrastructure, and forms the basis of mobilising investment for quality infrastructure, as set forth in the G7 Ise-Shima Principles for Promoting Quality Infrastructure Investment. The selected voluntary policy recommendations seek to assist governments in tackling key challenges linked to mobilising private financing for infrastructure and SMEs, in particular from institutional investors and capital markets and diversifying financial instruments with special attention to equity financing. The use of risk mitigation techniques and various funding models for infrastructure are also important parts of the recommendations.
- In order to assist countries in meeting their development and investment goals, the OECD has developed indicators to help countries design national action plans and assess progress in meeting the 17 SDGs. Within the framework of Ise-Shima Principles and Transparency & Openness, further analysis will highlight policy gaps between existing guidelines and outstanding challenges of emerging and developing economies that still need to be addressed.
- Research on new technologies and innovation in infrastructure, in particular the emergence of blockchain and distributed ledger technologies, is uncovering ways to improve infrastructure performance through digitalisation, performance measurement through better data and information, enhancing sustainability, while building greater trust with civil society. The OECD just held last week for the first time the "OECD Blockchain Policy Forum", with many messages coming out from this key event on the potential applications of blockchain for infrastructure to explore further.
- A project "Financing Climate Futures", which is a follow-on to Investing in Climate, Investing in Growth, focuses on ways to accelerate the financing of high-quality resilient infrastructure that is in alignment with long-term de-carbonisation.

[4] https://www.oecd.org/development/promoting-quality-infrastructure-japan-april-2018.htm

- The OECD Centre on Green Finance and Investment brings together policy makers, regulators and market participants to catalyse investment in the transition to a clean, low-emission, and climate-resilient global economy, looking at tools including green bonds and green banks.

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Green Finance and Investment

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