UNIVERSITY OF CENTRAL ASIA

GRADUATE SCHOOL OF DEVELOPMENT

Decarbonization of energy in Central Asia

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Content

About the study

- The study aims to assess the political environment in Central Asia to determine how effectively current policies support the transition to more sustainable energy with lower emissions.

- The result of the study will be an analytical review that will detail the current situation and the policies adopted by the national states of the region, along with an evaluation and recommendations for aligning energy infrastructure investments with the goals of the Paris Agreement and the 2030 Agenda for Sustainable Development in Central Asia.

Study workflow

Phase I
- Collection and preparation a dataset of investment in energy infrastructure projects for 6 CA countries over 16 years (2008-2023)

Phase II
- Desk analysis of national policies and reports of international agencies related to decarbonization of energy infrastructure

Phase III
- Identification of key challenges and opportunities for energy decarbonization in the CA region

Phase IV
- Data analysis to get understanding of investment trends for carbon-intensive and low-carbon energy infrastructure.

Phase V
- Discussion and conclusion based on identified investment patterns

Key policy documents for energy decarbonization in CA (1)

Kazakhstan

- Sustainable Industrial Transformation Strategy (2024)
- Energy Ministry's Renewable Energy Program (2020)
- Nationally Determined Contribution (2022)

Kyrgyzstan

- Implementation of Energy Conservation and Energy Efficiency Policy in the Kyrgyz Republic for 2023-2027
- Program for the Development of the Green Economy in the Kyrgyz Republic for 2019-2023
- Updated Nationally Determined Contribution (2021)

Mongolia

- Law of Mongolia on Energy (2015)
- Nationally Determined Contribution (2020-2030)
- Mongolia’s Vision 2050 (2020)

Key policy documents for energy decarbonization in CA (2)

Tajikistan

- Energy Efficiency Master Plan (2011)
- Power Sector Development Master Plan Final Report (2017)
- Nationally Determined Contribution (2021)

Turkmenistan

- Renewable Energy Law (2020)
- Nationally Determined Contribution (2021)
- Gas-to-Liquids (GTL) Technology Investment Initiative (2014)

Uzbekistan

- Law of the Republic of Uzbekistan on the Utilization of Renewable Energy Sources (2019)
- Presidential Decree on Measures to Increase the Efficiency of Reforms Aimed at Transitioning the Republic of Uzbekistan to a Green Economy by 2030 (2022)
- Updated Nationally Determined Contribution (2021)

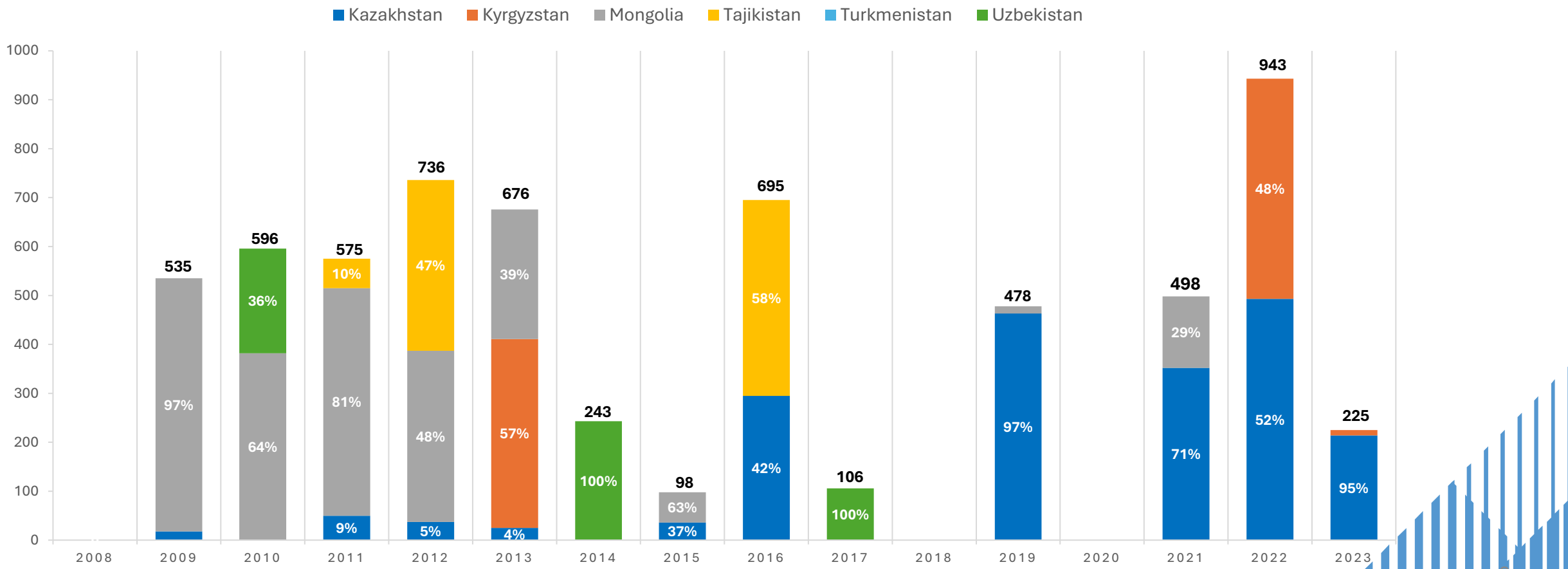
Challenges (common for CA region)

- Outdated infrastructure and limited investment in energy modernization hinder the adoption of efficient technologies and integration of renewables (UNDP, 2019).
- Despite some diversification efforts, transitioning to renewables is slowed by high infrastructure costs, limited financing, outdated grids, and harsh winters that reduce solar efficiency to around 30% (UNDP 2024).
- The lack of policy frameworks specifically geared toward decarbonization creates regulatory uncertainty, discouraging potential investors in RE projects (IEA, 2023).

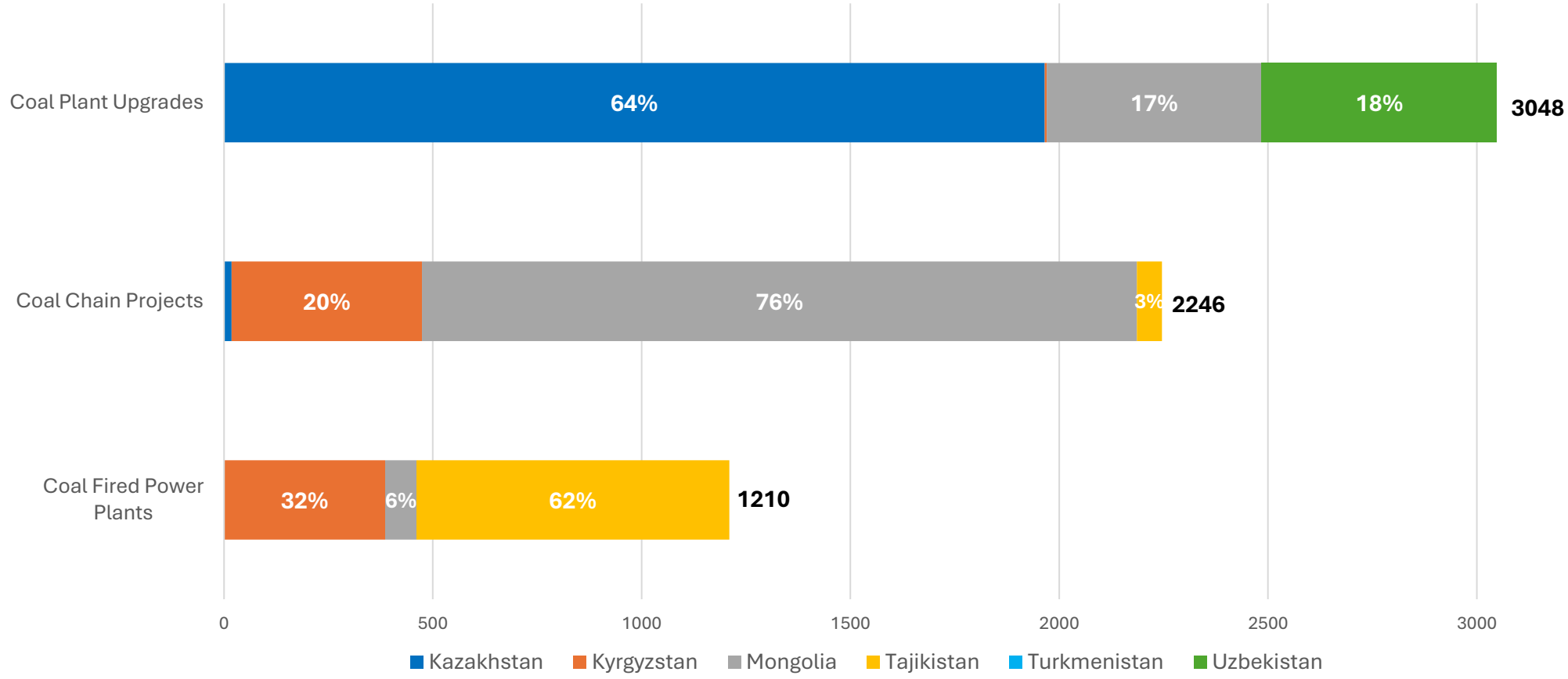
Opportunities (unique for each country)

- The international investments in green technology are on the rise, which could facilitate the transition to a low-carbon economy (World Bank, 2023).
- Despite these barriers, there is a strong potential in renewable energy, particularly hydropower, solar, and wind (IRENA, 2021).
- There is substantial potential for solar energy, given its high levels of sunshine throughout the year (Kabbaj & Baum, 2023).

Total investment in coal infrastructure projects for 16 years by countries, mln. USD

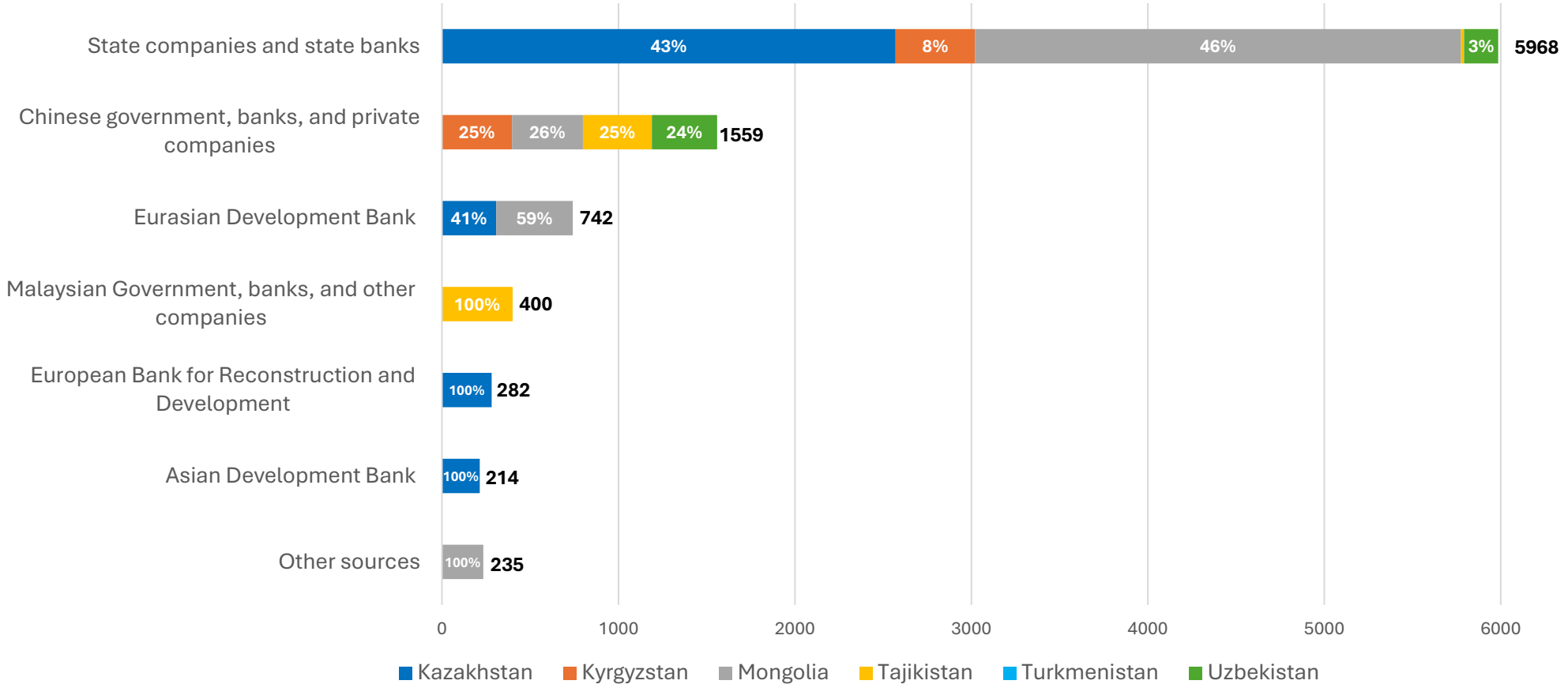


Total investment in coal infrastructure projects for 16 years by countries and clusters, mln. USD



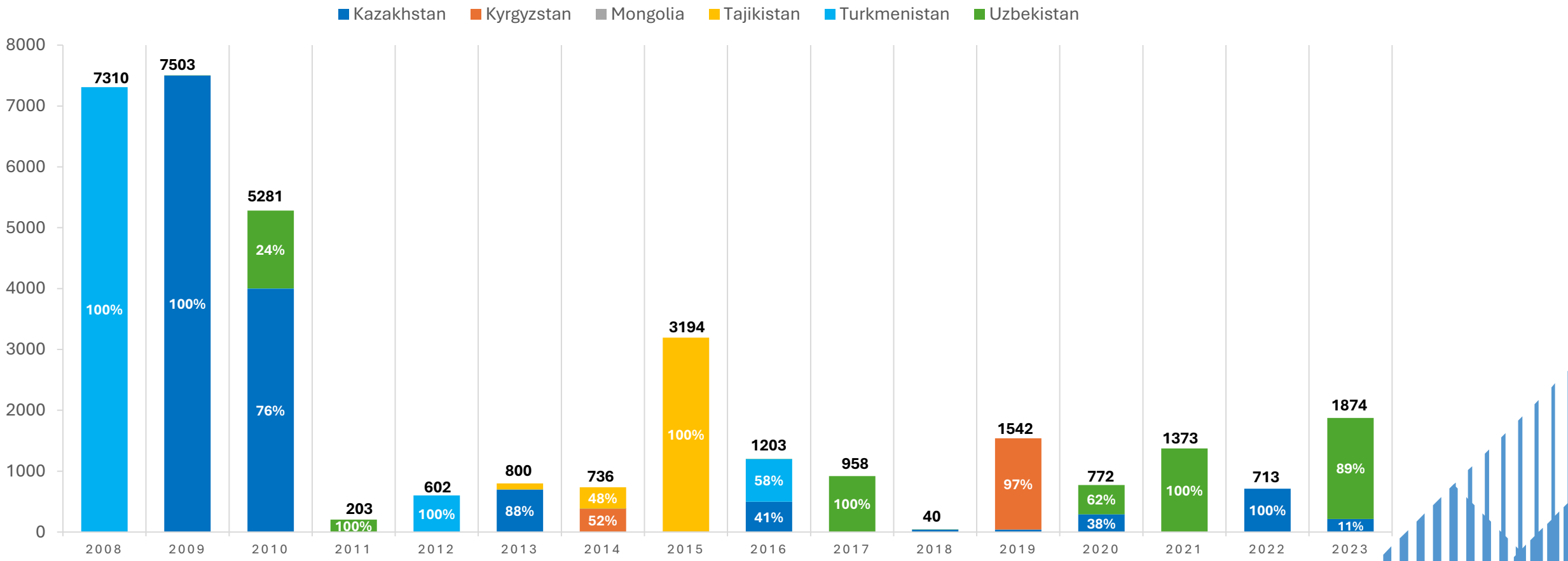
Note: The Coal Chain Projects include Coal Mining, Coal Transportation, and Coal Processing

Total investment in coal infrastructure projects for 16 years by donors and countries, mln. USD

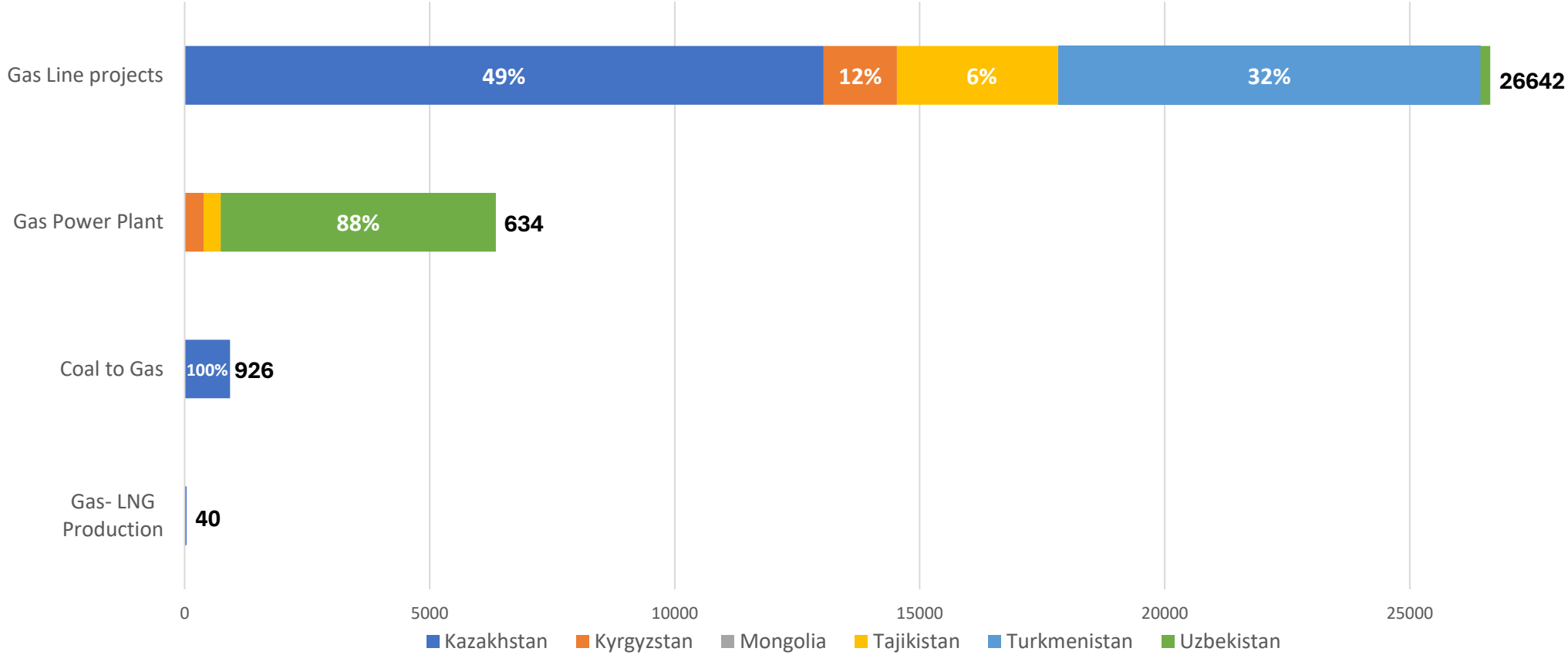


Note: Other sources include funding from such agencies as UNDP, Green Climate Fund, Japan agencies and funds, etc.

Total investment in gas infrastructure projects for 16 years by countries, mln. USD

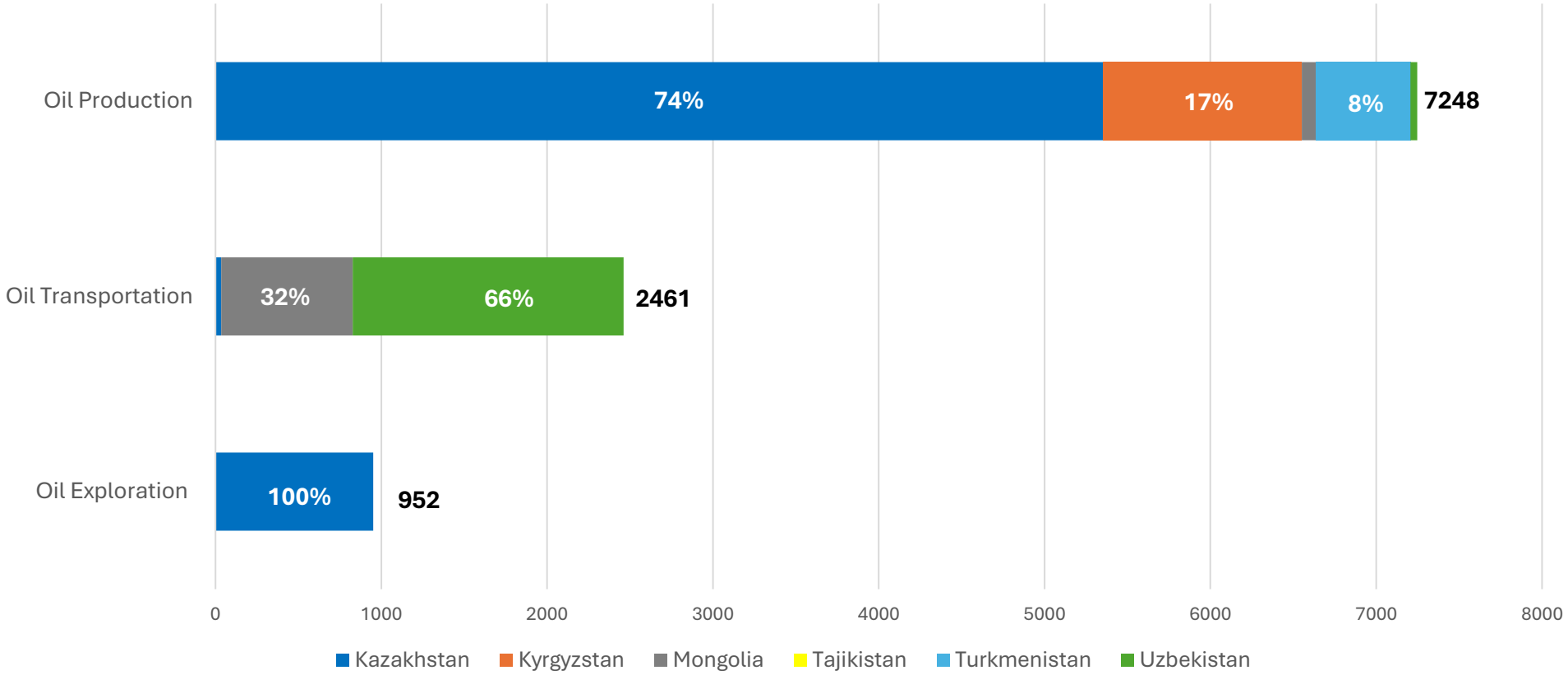


Total investment in gas infrastructure projects for 16 years by countries and clusters, mln. USD



Note: Gas – LNG Production was 100% for Kazakhstan

Total investment in oil infrastructure projects for 16 years by donors and countries, mln. USD



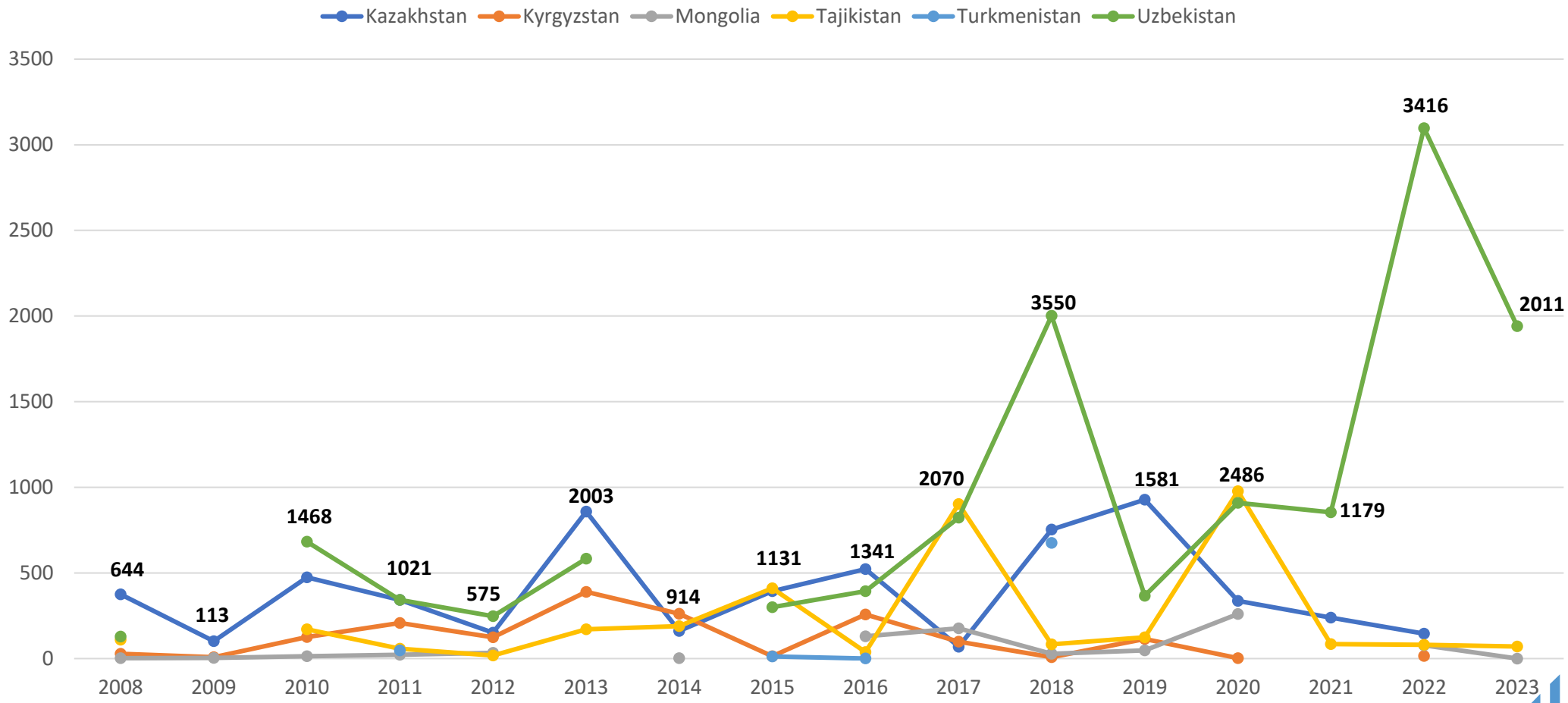
Key challenges: carbon-intensive energy projects

- Carbon-intensive energy projects continue to play a significant role in the Central Asian region. Key clusters of such infrastructure include oil production (Kazakhstan), gas transmission facilities (Kazakhstan, Turkmenistan, and Uzbekistan), and coal-related projects (Mongolia).

- State-owned companies, banks, and various Chinese entities still prioritize carbon-intensive energy sources, while multilateral development banks (MDBs) are increasingly investing less in these projects.

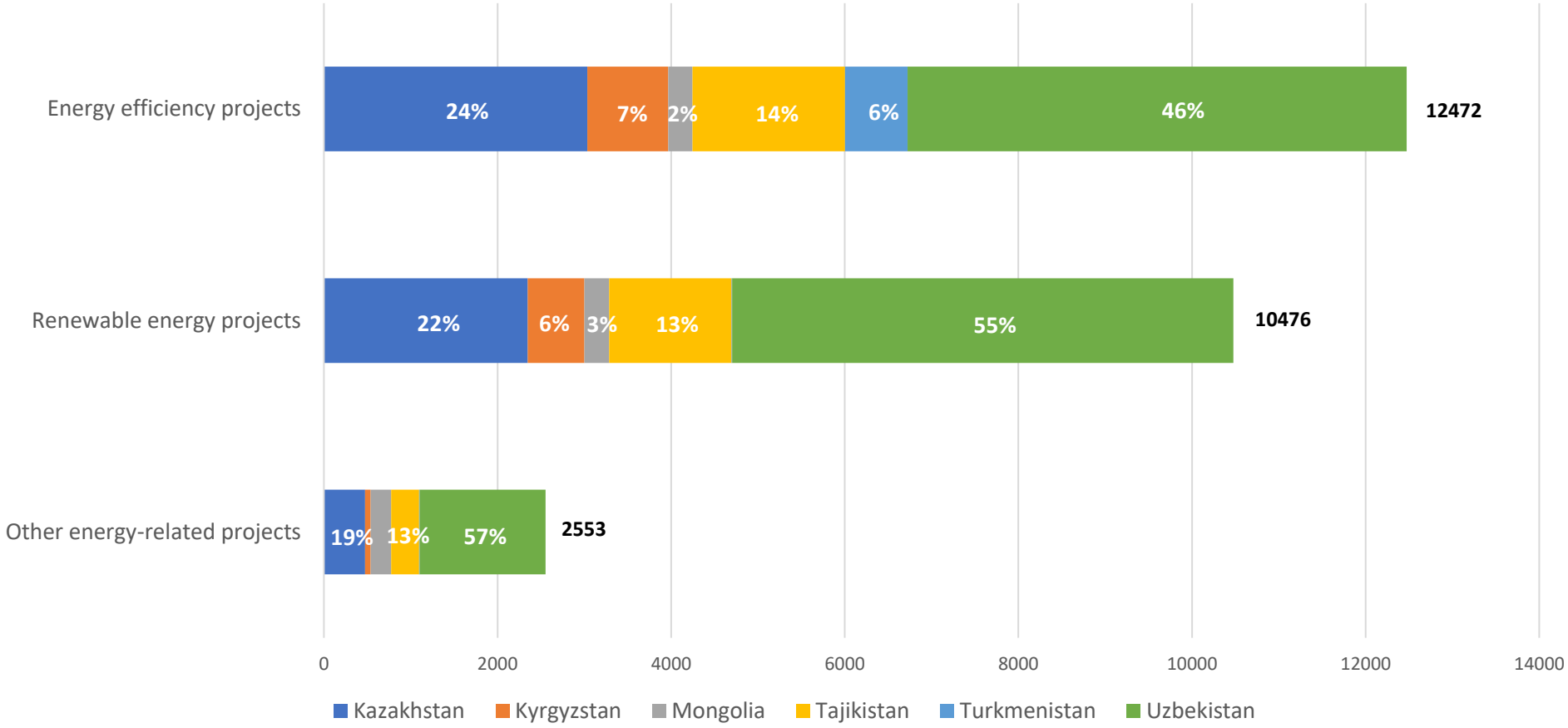
- The presence of carbon-intensive energy infrastructure is substantial, with the entire Central Asian region seeing considerable investment, particularly in coal projects. Notably, investment trends in gas infrastructure have fluctuated over the past 16 years.

Dynamics of investment in low-carbon infrastructure projects for 16 years by countries, mln. USD



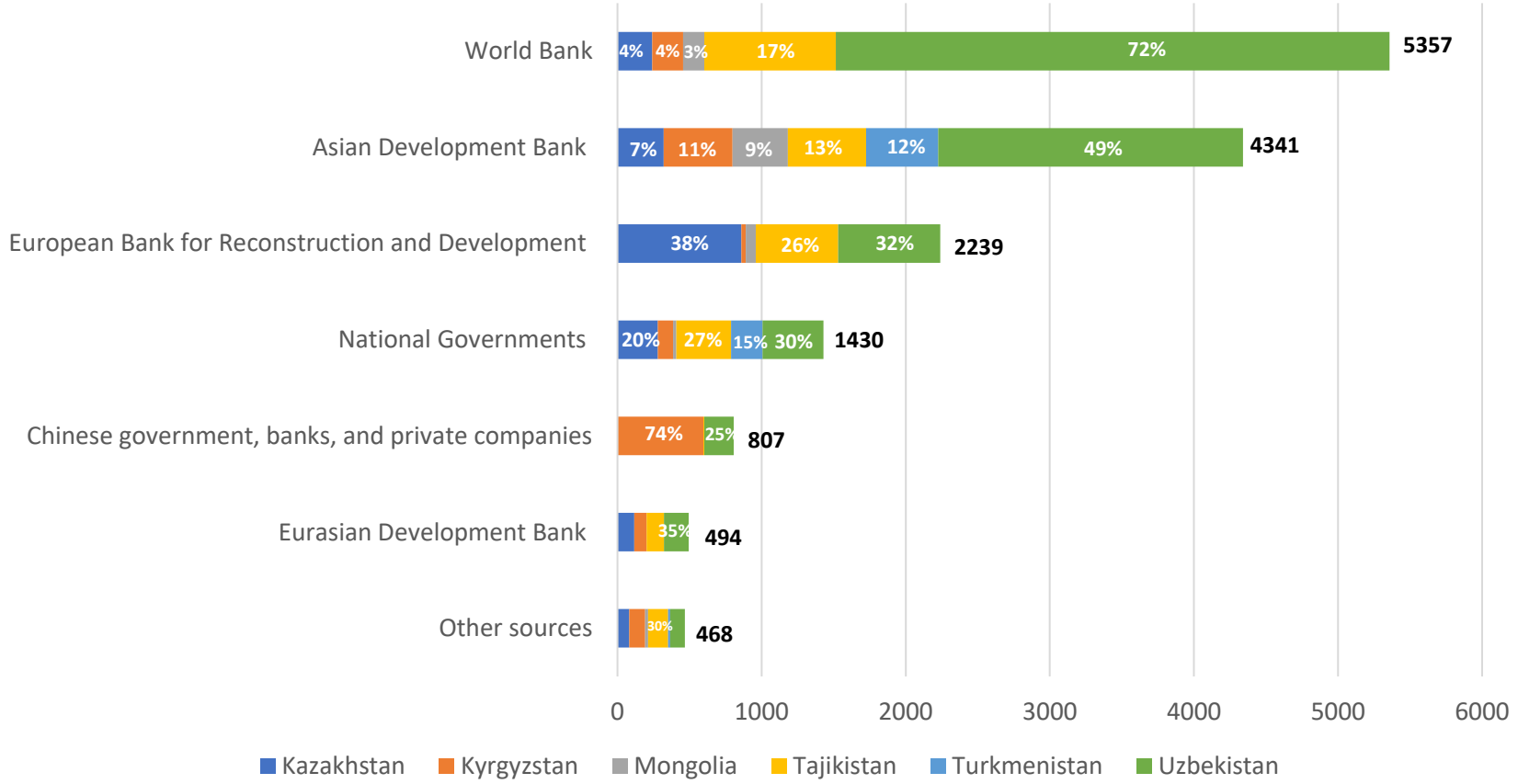
Note: Numbers in **bold** represent total investment in 6 CA countries for a particular year.

Total investment in low-carbon energy infrastructure projects for 16 years by countries and clusters, mln. USD



Note: Other energy-related projects include such projects as modernization of energy equipment, grid optimization, etc.

Total investment in low-carbon energy infrastructure projects for 16 years by donors and countries, mln. USD



Note: Other sources include funding from such agencies as UNDP, Green Climate Fund, Japan agencies and funds, etc.

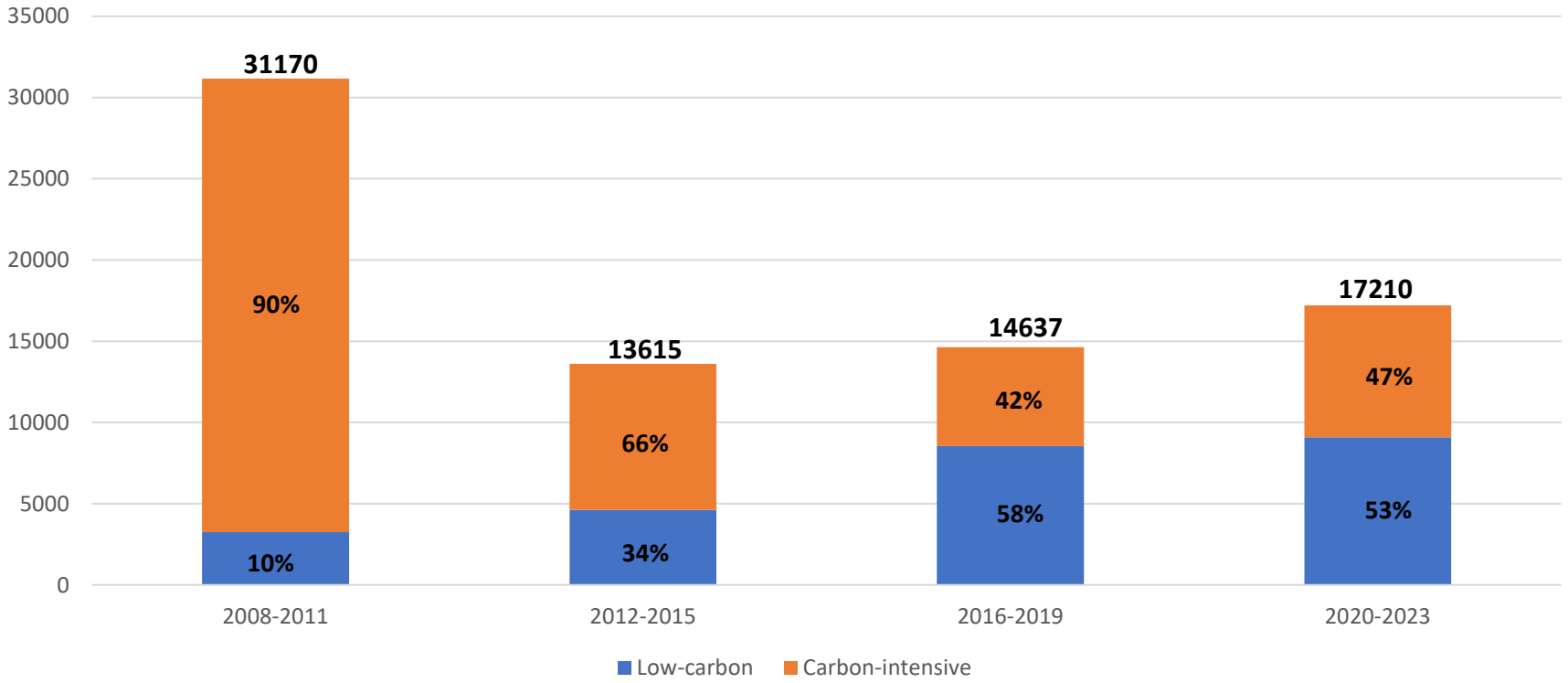
Key findings: low-carbon energy projects

- Among the types of low-carbon energy infrastructure investment projects, energy efficiency projects hold a significant share. However, investments in renewable infrastructure have seen a sharp increase in recent years. Kazakhstan and Uzbekistan are notable as the primary recipients of these investments.

- The distribution of investments by donors and countries highlights Uzbekistan as a major beneficiary and Mongolia as a minor recipient. Multilateral Development Banks (MDBs), national governments, and Chinese entities have made substantial investments in energy-efficiency projects.

- Over the past 16 years, energy infrastructure investment trends across six countries have shown fluctuating patterns. Uzbekistan has emerged as a leader in attracting investments in low-carbon projects, while Mongolia has consistently received a negligible amount of funding.

Putting all together: investment trend dynamics in Central Asia, mln. USD



Note: For the period 2008-2023, total amount of investments in carbon-intensive and low-carbon energy infrastructure projects constituted **51 131 mln. USD** (or **67%** of the total) and **25 501 mln. USD** (or **33%** of the total), respectively.

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Thank you!

Questions?