

Fossil Fuels in Central Asia: Trends and Energy Transition Risks

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ABSTRACT

This data article provides an overview of fossil fuel trends in Central Asia from 2010 to 2019. Data on the production, consumption, export and import of coal, natural gas and oil are summarised for Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. While promoting renewable energy, Central Asia continues to rely on and expand the use of coal, natural gas and oil with no major phase-out plans yet on the horizon.

Keywords: fossil fuels, Central Asia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan

1. Background and data

The Central Asian states of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan are latecomers to the global energy transition (Vakulchuk and Overland, 2021; Mouraviev, 2021). Only since 2018 has renewable energy been one of the priorities of the region's economic development.

Kazakhstan and Uzbekistan – two major economies in Central Asia – have been particularly active in launching renewable energy projects (Laldjebaev et al., 2021; Eshchanov et al., 2021; Shadrina, 2020). Kazakhstan announced a plan to achieve 50% renewables by 2050, and in December 2020, Kazakhstan's President, Kasym-Jomart Tokayev, announced that the country would seek to achieve carbon neutrality by 2060. Yet, despite the positive pro-climate rhetoric and ambitious renewable energy targets, Central Asia is still a major exporter of hydrocarbons, which is a role that it has actively played since 1991.

There are two main dimensions of energy transition: the promotion of clean energy and the phasing-out of fossil fuels (Overland et al., 2019; Overland, 2019). This data article focuses on the status of fossil fuel phase-out in Central Asia, a topic on which only limited research has thus far been produced. It provides an overview of the trends in the use of fossil fuels in Central Asia from 2010 to 2019. Data on the production, consumption, export and import of coal, natural gas and oil were collected and summarised for Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. These data are also available in a unified dataset in Excel format from <http://osce-academy.net/en/research/cadgat/>

2. Data collection

The data in this article cover 2010–2019 and were gathered from August to December 2021 based on information obtained from national and international sources.

3. Findings

Tables 1-5 present detailed data on the production, domestic consumption, export and import of fossil fuels in each Central Asian country. The major trends during 2010–2019 were as follows: (1) the consumption of fossil fuels either remained largely unchanged or actually increased during the period; (2) while the countries officially recognised the need to decarbonise their energy sectors, this did not result in reduced consumption of coal, natural gas or oil; and (3) increasing electricity capacity sourced from renewable energy in Central Asia has not yet displaced electricity produced from fossil fuels.

Oil and gas production, consumption and exports have grown significantly in Kazakhstan and Turkmenistan, and much has been written about Central Asia's dependence on oil and gas (Schaik et al., 2021; Ma et al., 2020; Vakulchuk, 2016). However, the coal industry, the largest emitter of greenhouse gases among other fossil fuels, has received limited attention from the scholarly community.

Coal remains the major source of electricity production in Central Asia. In Kazakhstan, coal's share of power generation was 70% in 2020, while that of renewables was only 2.5% (IEA, 2021). The coal industry (mining, services and trade) remains an important source of employment, with several mono-industry towns built around coal mining sites. In 2018, more than 200,000 people (workers and their families) in Kazakhstan depended on income from the coal industry, which continues to be heavily subsidised by the government (companies are exempted from corporate income tax, land tax and property tax). Kazakhstan has the 8th largest coal reserves in the world (33.6 billion tonnes), is 10th among global producers and is also a major regional coal exporter (IEA, 2021). Coal exports also rose from 28 million tonnes in 2019 to 38 million metric tonnes in 2020, with Kyrgyzstan, Russia and Uzbekistan being the main importers.

Similarly, Kyrgyzstan generates more than 50% of its electricity from coal. By 2025, Kazakhstan and Kyrgyzstan plan to expand coal exports to many of their neighbours, including China. Uzbekistan also both produces coal and imports it from Kazakhstan and Kyrgyzstan, while Tajikistan produces coal and exports its surplus to both Pakistan and Uzbekistan.

4. Policy recommendations

While Central Asia is supportive of renewable energy, it continues to rely on coal, natural gas and oil with no major phase-out plans yet on the horizon. Based on the findings of this article, we propose the following policy recommendations:

1) *Adopt reduction targets for fossil fuels.* Unlike the targets adopted for increasing renewable energy, no targets were adopted to reduce the use of fossil fuels. The governments of Central Asian countries could put a greater effort into preparing strategies and policies for phasing out fossil fuels. A first step could be to adopt targets for the reduced extraction and use of coal, natural gas and oil.

2) *Assess the political, economic and social consequences of decarbonisation.* The decarbonisation of Central Asia poses significant risks to the region due to its dependence on fossil fuels as a source of public revenue, economic development, employment and political stability. The governments could assess these risks and develop systematic measures to address them.

3) *Establish a dialogue with importers.* The Central Asian fossil fuel exporters could establish a dialogue on decarbonisation with the European and Asian countries that import their fossil fuels.

4) *Scholars need to study the risks for Central Asia involved in not phasing out fossil fuels.* The scientific community that specialises in Central Asia's energy could focus more on identifying the risks and challenges if Central Asia fails to decarbonise its energy sector.

Table 1. Kazakhstan (in million tonnes)

Product	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Coal production	111	116	121	120	114	107	103	112	118	115
Coal consumption	335	363	378	375	370	34178	339	363	406	397
Coal imports	1	1	1	1	1	1	1	1	1	1
Coal exports	19	34	33	33	32	32	27	30	28	28
Natural gas production	9806	10356	10481	10993	11199	11263	11334	12169	12052	12022
Natural gas consumption	3372	3752	4030	4221	4740	4804	4998	5327	6135	6147
Natural gas imports	3	3	4	4	4	4	4	5	15	5
Natural gas exports	13	11	12	20	19	19	22	15	17	19
Oil production	80	80	79	82	81	80	79	87	91	91
Oil consumption	10	13	14	14	14	17	16	18	19	18
Oil imports	6	8	8	10	3	2	3	3	2	1
Oil exports	67	68	67	69	65	61	57	68	68	73

Source: See Unified CADGAT Database in Vakulchuk and Overland (2022).

Table 2. Kyrgyzstan (in thousand tonnes)

Product	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Coal production	575	830.7	1163.9	1406.8	1812	1928.7	1851.3	1870.4	2395.2	2606
Coal consumption	1860.7	2016	2831.8	2228.9	2813.1	n/a	2447.1	n/a	n/a	n/a
Coal imports	1100	1500	1800	1200	1200	1500	883	1000	967	676
Coal exports	19.2	77.9	215	173	250	253	418	550	912	1200
Natural gas production	8051.7	9394	10065	11477	11477	11159	10206	9181.8	9640.9	8616.8
Natural gas consumption*	0.4079	0.353	0.3761	0.3585	0.0379	0.1589	0.1658	0.1658	n/a	n/a
Natural gas imports	168	184	239	176	178	130	122	158	379	390
Natural gas exports*	0.038	0.119	0.115	0.185	0.099	0.576	0.315	0.044	2.2	1.5
Oil production	82.8	89.9	78.9	83.5	82	107.1	145.3	173.2	200	233
Oil consumption	1123.4	1193	1528.4	1526.3	1354.3	n/a	1684.4	n/a	n/a	n/a
Oil imports	1300	1200	1400	1700	1500	1500	1300	1700	1600	1200
Oil exports	105	113	103	138	127	106	148	170	209	180

* Million tonnes

Source: See Unified CADGAT Database in Vakulchuk and Overland (2022).

Table 3. Tajikistan (in thousand tonnes)

Product	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Coal production	220.5	260.1	454.2	568.8	967.8	n/a	1500.2	n/a	n/a	n/a
Coal consumption	228.2	252.4	478.4	579.8	980.0	n/a	1511.3	n/a	n/a	n/a
Coal imports	62.7	83.5	84.2	41.8	37.2	29.3	40.8	35.1	49.4	56.1
Natural gas consumption	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	n/a	n/a
Natural gas imports	34.1	93.7	263	252	235	309	327	350	422	487
Oil production	29.8	30.9	33.1	29.8	27.6	27.6	27.6	26.5	25.4	n/a
Oil consumption	466.1	490.8	663.0	772.8	952.4	n/a	884.3	n/a	n/a	n/a
Oil imports	576	335	432	398	541	571	654	689	489	635

Source: See Unified CADGAT Database in Vakulchuk and Overland (2022).

Table 4. Turkmenistan (in thousand tonnes)

Product	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Natural gas production*	14161	19882	20836	20836	22425	23272	22319	20730	21719	22319
Natural gas consumption*	6463	7310	8087	6816	7063	8970	8864	8758	10029	11124
Natural gas imports	0.02	0.011	0.001	0.002	0.001	0.003	0.001	0.024	0.015	0.012
Natural gas exports	2600	11900	16500	18700	19200	21200	22900	24900	25500	24100
Oil production	11100	11500	12000	12500	12900	13200	13200	13100	12600	12200
Oil consumption	5500	5800	6000	6200	6500	6500	6500	6500	6500	6700
Oil imports	15.5	23.7	30.2	33.9	29	23.5	132	24.9	27.5	35.5

* Million tonnes

Source: See Unified CADGAT Database in Vakulchuk and Overland (2022).

Table 5. Uzbekistan (in thousand tonnes)

Product	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Coal production	3629	3845	3753	4090	4397	3488	3867	4039	4174	4048
Coal consumption	7170	9560	11950	16730	16730	11950	14340	14340	21511	19120
Coal imports	39	32	36	24	19	24	27	24	37	62
Coal exports	23	2	0.1	n/a	n/a	n/a	1.8	5.5	23	14
Natural gas production*	20165	19988	19953	19741	19882	18929	18752	18858	20200	20235
Natural gas consumption*	15538	16739	16315	16315	17128	16351	15291	15221	15680	15680
Natural gas imports	0.003	35	0.003	n/a	n/a	0.006	n/a	391	277	172
Natural gas exports	2100	2700	1700	3800	3400	3200	3600	5200	12200	7500
Oil production	3600	3600	3200	2900	2800	2700	2600	2800	2900	2800
Oil consumption	4293	3657	3537	3818	3433	3462	3590	3757	4151	4324
Oil imports	1100	693	736	809	630	812	1100	1300	1200	1200
Oil exports	1200	774	88	115	81	11	7	210	114	149

* Million tonnes

Source: See Unified CADGAT Database in Vakulchuk and Overland (2022).

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The Norwegian Institute of International Affairs (NUPI) and the OSCE Academy established the Central Asia Data-Gathering and Analysis Team (CADGAT) in 2009. The purpose of CADGAT is to produce new cross-regional data on Central Asia that can be used free of charge by researchers, journalists, NGOs, government employees, and students, both inside and outside the region. The data articles can be found at <http://osce-academy.net/en/research/cadgat/>

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28. Fossil fuels in Central Asia: Trends and energy transition risks

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