

“Silk Road Economic Belt” : Current Status, Problems, and Countermeasures of Oil and Gas Trade Cooperation between China and Central Asian Countries (Postprint)

Authors: Yang Yu, Why?, Liu Yi

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Abstract

Central Asia represents the nearest and most secure guarantee area for oil and gas resources to China, constituting a crucial overseas energy supply base for the country. The region's current annual oil and gas production amounts to approximately 229 million tons of oil equivalent, accounting for 3.02% of global annual oil and gas output, with natural gas reserves concentrated primarily in Turkmenistan and Kazakhstan, and oil reserves focused mainly in Kazakhstan. The annual external supply potential of oil and gas resources in Central Asia stands at approximately 120 million tons of oil equivalent. China has progressively emerged as Central Asia's most important oil and gas trading partner. However, China-Central Asia oil and gas trade cooperation confronts a series of potential risks, including great power competition, unstable domestic political environments, fragmentation of international energy cooperation institutions, and lack of sustainability in international energy investment policies. Going forward, China should expedite the establishment of a pragmatic and efficient diversified energy cooperation mechanism, optimize the main structure of energy cooperation, enhance technology trade in energy exploration, development, and deep processing, accelerate the promotion of local energy processing and conversion, and revise existing bilateral investment agreements to ensure the security of China-Central Asia energy cooperation and trade.

Full Text

Global Energy Cooperation Between China and Central Asia: Current Situation, Risks, and Countermeasures

YANG Yu^{1,2,3*}, HE Ze^{1,2,3}, LIU Yi^{1,2,3}

¹Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, Beijing 100101, China

²Key Laboratory of Regional Sustainable Development Analysis and Simulation, Chinese Academy of Sciences, Beijing 100101, China

³College of Resources and Environment, University of Chinese Academy of Sciences, Beijing 100049, China

Abstract

Central Asia represents the nearest and most secure oil and gas resource guarantee zone for China, serving as a crucial overseas energy supply base. Current annual oil and gas production in Central Asia stands at approximately 229 million tons of oil equivalent, accounting for 3.02% of global output, with natural gas concentrated primarily in Turkmenistan and Kazakhstan, and oil predominantly in Kazakhstan. The region's annual export potential reaches approximately 120 million tons of oil equivalent. China has gradually emerged as Central Asia's most important oil and gas trading partner. However, China-Central Asia energy trade cooperation faces a series of potential risks, including great power competition, internal political instability, fragmentation of international energy cooperation institutions, and unsustainable international energy investment policies. Moving forward, China should accelerate the establishment of pragmatic and efficient multilateral energy cooperation mechanisms, optimize the structure of entities participating in energy cooperation, strengthen technology trade in energy exploration and deep processing, promote local energy processing and transformation, and revise existing bilateral investment treaties to ensure the security of China-Central Asia energy cooperation and trade.

Keywords: Central Asia; oil and gas trade; energy cooperation; risk; counter-measures

1. China's Growing Energy Demand and External Dependence

Since the 1980s, China's oil and gas consumption has increased continuously, with external dependence rising steadily. Annual oil and gas consumption exceeded 200 million tons of oil equivalent in 1993, surpassed 300 million tons in 2000, and reached 854 million tons in 2016. Driven by large-scale urbanization and industrialization, China's demand for oil and gas remains robust. In recent years, China has undertaken massive energy structure adjustments, actively promoting new energy sources such as solar and nuclear power. However, the substitution effect of new energy on oil and gas remains limited in the short term, and oil and gas consumption has not shown any significant decline. Compelled by climate change and carbon reduction pressures, China's natural gas consumption proportion has increased substantially, and external dependence on oil and gas will continue to rise. In 2015, the foreign trade dependence ratio exceeded 60%, far surpassing the 50% warning line set by the International Energy Agency for its member states, placing enormous pressure on China's

energy security.

2. Central Asia' s Oil and Gas Production and Supply Potential

2.1 Fluctuating Yet Rising Production Trends Central Asia' s annual oil and gas production has generally exhibited a fluctuating upward trend since the 1980s. A slight increase occurred in the 1980s, but production fell from 144 million tons of oil equivalent in 1990 to 100 million tons in 1998, with its global share dropping from 2.91% to 1.80%. After 1999, except for declines in 2009 and 2010 due to the aftermath of the global financial crisis, production maintained stable growth in other years, reaching 229 million tons of oil equivalent in 2016, accounting for 3.02% of global production [Figure 1: see original paper].

2.2 Imbalanced Production Patterns Central Asia's production landscape shows significant imbalance, with Kazakhstan dominating oil production and Turkmenistan leading gas production [Figure 2: see original paper]. Before 1998, Kazakhstan' s oil and gas production remained below 30 million tons of oil equivalent. Since the 21st century, production has risen markedly, exceeding 40 million tons in 2000, reaching 80 million tons after 2008, and totaling 97.2 million tons in 2016. Prior to 1996, Kazakhstan' s share of Central Asian production was less than 25%, but since 2008 it has stabilized above 40%.

Turkmenistan' s production initially declined then gradually increased, falling from 74.54 million tons of oil equivalent in 1985 to 17.2 million tons in 1998, then rising by over 55.62 million tons during 1999–2016 to reach 72.82 million tons in 2016, representing 31.79% of Central Asian output. Uzbekistan' s production grew continuously from 30 million tons to 59.08 million tons during 1985–2016, accounting for 25.79% of the regional total.

2.3 Production-Consumption Gap and Export Potential From 1985 to 2016, Central Asia' s total annual oil and gas consumption grew from 82 million tons to 107 million tons of oil equivalent, an increase of only about 25 million tons over 32 years. Due to generally low downstream refining capacity across Central Asian countries, the production-consumption gap is primarily exported as oil and gas trade. Before the 1991 Soviet dissolution, annual export capacity remained stable at 50–60 million tons of oil equivalent. The gap plummeted to 36.46 million tons in 1992 and further to 24.6 million tons in 1998 [Figure 3: see original paper]. With assistance from multinational corporations after 1999, regional production rose continuously, reaching a production-consumption gap of 66.53 million tons in 2000 and 109 million tons in 2005. Since 2011, the gap has stabilized at approximately 120 million tons, reaching 122 million tons in 2016.

Overall, without considering production increases in the Central Asia-Caspian region, Central Asia' s annual exportable oil and gas supply will remain around 120 million tons of oil equivalent for the next two decades. In the medium to

long term, as resources in Uzbekistan and Kazakhstan become depleted, Turkmenistan's natural gas resources will become the pillar supporting Central Asian energy supply.

3. Central Asia's Export Patterns and Trade Relations with China

3.1 Evolving Export Destinations Following the Soviet Union's collapse, Central Asian countries entered a power vacuum and actively sought diversified oil and gas trade. In terms of trade blocs, Central Asia remained subordinate to the Russia-EU trade group, while Uzbekistan and Turkmenistan were positioned outside the three major trading blocs. The number of export destinations increased from 11 in 1995 to 31 in 2015, with export volumes growing from less than 10 million tons to 77.22 million tons of oil equivalent in 2015 .

Europe was once Central Asia's primary export market, accounting for over 80% of regional energy trade in 2005, with Ukraine, Germany, Italy, and France each importing over 5 million tons annually, representing 62.89% of total exports. After 2005, China's increasing imports reduced Europe's share to a low of 46.19% in 2013. Currently, China is Central Asia's most important oil and gas export destination, receiving 40.9% of its annual exports [Figure 4: see original paper].

3.2 Asymmetric Interdependence in China-Central Asia Energy Trade **Natural Gas Trade:** China imports natural gas primarily from Turkmenistan, Uzbekistan, and Kazakhstan, with annual imports of approximately 26.6 million tons of oil equivalent, accounting for about half of China's total natural gas imports. Turkmenistan supplies 93.59% of these imports . A highly interdependent gas trade partnership has formed: Turkmenistan ranks as China's 8th largest oil and gas supplier and largest natural gas source, with China receiving 33.38% of its natural gas imports from Turkmenistan.

Oil Trade: China's oil imports from Central Asia come mainly from Kazakhstan, showing a distinct rise-and-fall pattern. Imports grew steadily from 1997 to 2013: from 45,000 tons in 1997, surpassing 1 million tons in 2002, exceeding 10 million tons in 2010, and peaking at 11.98 million tons (4.25% of China's total oil imports) in 2013. However, Kazakhstan's oil exports to China dropped sharply to 5.68 million tons in 2014, 4.99 million tons in 2015, and 3.23 million tons in 2016, representing 1.84%, 1.49%, and 0.85% of China's oil imports respectively. In September 2016, President Nazarbayev stated Kazakhstan could expand oil exports to China, with the resumption of Kashagan field production providing a foundation to elevate bilateral trade to new levels.

4. Potential Risks in China-Central Asia Energy Trade

4.1 Geopolitical Risks from Great Power Competition Following the Soviet Union's collapse, Central Asia's strategic location and abundant resources quickly made it a focal point for major global powers and international

capital. Competition among China, Russia, and the United States shapes the regional energy landscape, determining the strategic direction of international energy cooperation. The EU, Iran, Turkey, Japan, South Korea, and India also intervene through various channels to advance their energy strategic objectives. According to incomplete statistics, oil companies from the United States, United Kingdom, France, Germany, Italy, Turkey, Canada, Japan, India, South Korea, Russia, China, Argentina, Hungary, Oman, and the UAE are active in Central Asian exploration, development, and sales.

Post-financial crisis, the United States and Russia accelerated strategic adjustments to compete for energy geopolitical dominance. In 2011, the U.S. proposed the “New Silk Road” initiative to create a strategic corridor from Central Asia through Afghanistan to South Asia. Russia responded with the “New Eurasian Integration Program” and launched the Eurasian Economic Union in January 2015. In March 2015, China released its “Vision and Actions on Jointly Building Silk Road Economic Belt and 21st-Century Maritime Silk Road,” which offers distinct advantages through pragmatic economic and trade cooperation rather than strategic competition. However, China’s institutional engagement remains disproportionate to its national strength compared to Russian and American involvement.

4.2 Internal Political Instability in Central Asian Countries Although all Central Asian countries have transitioned from planned to market economies, their implementation varies. Kyrgyzstan adopted radical reforms similar to Russia’s, while Kazakhstan and Tajikistan pursued gradual transitions retaining substantial planned economy elements. Turkmenistan and Uzbekistan implemented only “limited reforms.”

Heavily dependent on the oil and gas industry, Central Asian countries maintain highly monopolistic resource development policies. Combined with the unique “presidential centralization” political systems, energy policies are often politically motivated rather than purely commercial, fostering corruption, rent-seeking, and economic crime. According to Transparency International’s 2017 Corruption Perceptions Index, Kazakhstan ranks 122nd out of 180 countries—the highest in Central Asia—while Kyrgyzstan (135th), Uzbekistan (157th), Tajikistan (161st), and Turkmenistan (167th) rank near the bottom.

Terrorist activities further destabilize the investment climate. In 2011, Kazakhstan experienced its most severe terrorist attacks since independence, along with unrest in the “oil city” of Zhanaozen. Given that international energy cooperation involves large sums and long timeframes, this political ecology significantly increases investment risks and undermines Chinese investor confidence, adversely affecting China-Central Asia energy cooperation.

4.3 Fragmentation of International Energy Cooperation Institutions

Central Asia features multi-level, multi-domain energy cooperation institutions with evident complexity and fragmentation. Current frameworks include: (1)

Institutionally-coordinated cooperation, such as the Shanghai Cooperation Organization's multilateral energy mechanism and the Asian Development Bank's Central Asia Regional Cooperation energy framework; (2) Bilateral cooperation led by external powers, including China's "Belt and Road," U.S. "New Silk Road," and Russia's "2035 Energy Strategy"; and (3) Inter-Central Asian cooperation mechanisms.

This "institutional density" creates interconnections and conflicts among frameworks, with no dominant institution enjoying broad support, introducing uncertainty for future cooperation. Central Asian countries have formed exclusive energy cooperation blocs through agreements with the U.S., Russia, China, EU, Japan, South Korea, India, Iran, and Turkey. Meanwhile, multinational corporations create multiple cooperation and competition blocks, splitting countries' positions and identities, with diversified power and decentralized institutions inevitably leading to cooperation dilemmas.

4.4 Unsustainable International Energy Investment Policies Central Asian countries universally suffer from capital shortages and technological deficiencies, making favorable investment conditions essential for energy development. They have enacted numerous oil and gas laws, including Kazakhstan's "Oil Law," "Investment Law," "Subsurface Resources Law," and "Mineral Resources Law," plus Turkmenistan's and Uzbekistan's foreign investment laws, establishing relatively complete legal frameworks.

However, these legal policies lack consistency, with high amendment risks influenced by political systems. Presidential decrees arbitrarily modify legislation, reducing legal binding force and credibility while increasing expropriation risks for foreign investors. Since the 21st century, influenced by global resource nationalization, Central Asian countries have frequently revised oil and gas regulations to strengthen industry control, replacing previously liberal investment and fiscal policies with mandatory measures.

Kazakhstan exemplifies this trend: in 2009, it introduced new tax policies, drastically adjusting oil and gas extraction taxes for three consecutive years, imposing mineral resource extraction taxes and oil/gas export revenue taxes, and altering excess profit tax calculation methods. In 2010, Kazakhstan repeatedly revised its Subsurface Resources Law to expand resource control and strengthen supervision of existing contracts. Government intervention, legal changes, and policy tightening have become major policy risks for international energy investment in Central Asia.

5. Countermeasures for Strengthening China-Central Asia Energy Trade Cooperation

5.1 Establish Pragmatic and Efficient Multilateral Energy Cooperation Mechanisms International experience demonstrates that robust regional multilateral energy cooperation mechanisms effectively maintain energy

security and benefit participating nations. Current Central Asian energy cooperation frameworks remain largely principled and lack substantive, binding agreements. Under the Belt and Road Initiative, China should strengthen SCO energy cooperation consultations to form meaningful, binding multilateral mechanisms. In promoting cooperation, China must consider the energy interests and economic influence of major powers like Russia and the U.S., developing multilateral frameworks that address different stakeholders—exporting, transit, and importing countries—to create an energy community with shared interests.

Given China's energy situation, bilateral cooperation difficulties, and complex regional geopolitics, China should strategically enhance multilateral dialogue capacity, coordinate institutions for China-Kazakhstan, China-Turkmenistan, China-Uzbekistan, China-Kyrgyzstan, and China-Tajikistan energy cooperation, and establish specialized multilateral dialogue mechanisms for Central Asia. Participating nations should share energy information and deepen political trust to ensure practicality and stability of multilateral cooperation outcomes.

5.2 Optimize Enterprise Structure in Central Asian Energy Cooperation

Currently, China primarily participates in Central Asian energy affairs through state-owned enterprises (SOEs). As energy is a strategic resource, SOE overseas activities are often labeled as state behavior, raising concerns among Central Asian governments and populations and risking resource nationalism-driven asset expropriation. SOE complexities also create disadvantages: lengthy decision-making processes, single cooperation modes, and insufficient flexibility weaken competitiveness in overseas energy cooperation.

Building on existing SOE-established platforms, China should actively encourage small and medium-sized energy enterprises to participate, strengthen collaboration between state-owned and private enterprises, and establish “going global” industry alliances. Developing long-term, stable, and mutually trusting economic partnerships with host country governments and local communities will reduce the political coloration of energy cooperation and guard against resource nationalism risks.

5.3 Strengthen Deep Processing Cooperation and Technology Trade Services

From Central Asian countries' long-term development perspectives, energy industry priorities have shifted from simple oil and gas trade to mid-stream and downstream refining and chemical sectors. Central Asian oil and gas processing enterprises suffer from low operating rates and outdated production technologies, resulting in insufficient processing depth and heavy dependence on imported high-end oil products. Kazakhstan possesses the strongest oil processing capacity in the region, yet its productivity remains far below major global producers. Refineries cannot meet environmental requirements, cannot produce high-octane gasoline or aviation kerosene, and the petrochemical industry is essentially non-existent. Kazakhstan, Turkmenistan, and Uzbekistan are actively promoting refinery upgrades and natural gas chemical projects.

By the end of 2014, China had established 23 integrated refining-chemical complexes, with 14 enterprises meeting international advanced standards of ten-million-ton refining and million-ton ethylene integration. China faces serious overcapacity, with refining overcapacity exceeding 100 million tons in 2016, and similar overcapacity in chlor-alkali, fertilizer, tire, and synthetic materials sectors. Strengthening energy deep processing cooperation with Central Asia aligns with China's international capacity cooperation strategy and Central Asian development needs. China can leverage its technological advantages to enhance technology trade services in oil and gas field exploration and development, energy infrastructure construction and maintenance, and energy product processing "turnkey projects."

5.4 Accelerate Local Processing and Transformation Cooperation

The Belt and Road Vision and Actions document emphasizes "promoting local and nearby processing and transformation of energy resources to form an integrated upstream-downstream industrial chain." Chinese oil companies must enhance local embeddedness of energy investment and services based on host countries' social development needs, making project cooperation an engine for building interest communities.

China could explore establishing extraterritorial energy industry cooperation demonstration zones. Based on comprehensive investment environment evaluations, China should select areas with stable political environments, relatively fair and transparent legal systems, and complete infrastructure to build energy industrial parks and technology cooperation zones. Through joint development of conventional and unconventional energy and new energy technology R&D and innovation, China can promote integrated upstream-downstream enterprise collaboration, achieving "spillover effects" in energy production and technology within demonstration zones, enhancing China's influence in Central Asian energy cooperation, and forming China-Central Asia energy cooperation "enclaves."

Additionally, China could explore establishing cross-regional joint energy reserve mechanisms. Such mechanisms would help stabilize long-term energy supply for host countries, reduce shocks from war, extreme events, and international political changes, and help supplier countries avoid energy market price fluctuations to ensure long-term oil and gas revenues. Cross-regional joint reserves are not limited to bilateral cooperation; China could implement joint energy reserves with Kazakhstan, Turkmenistan, and Uzbekistan, coordinating transnational reserves when necessary to maximize energy revenue for Central Asian countries and ensure stable supply for China.

5.5 Accelerate Revision of Existing Bilateral Investment Treaties

Bilateral Investment Treaties (BITs) constitute the most important legal basis for China-Central Asia energy cooperation and investment. Current BITs contain varying provisions on legal status of international investment and dispute resolution mechanisms, but regulations concerning energy investment affairs remain

vague. Except for the China-Uzbekistan BIT re-signed in 2011, agreements with other countries date from 1992-1993—over 20 years old. Global capital flows and energy investment environments have undergone profound changes since the 20th century, rendering these BITs insufficient to provide adequate, comprehensive protection for Chinese investors.

China's Belt and Road Initiative has gained widespread support from Central Asian countries, providing an opportunity to revise BITs. Drawing on the 2011 China-Uzbekistan BIT, China should accelerate negotiations to revise and improve key provisions: (1) Clarify investment admission scope and pre-admission treatment under bilateral and multilateral frameworks, stipulating most-favored-nation and national treatment, and leverage the “automatic 传导效应” (spillover effect) of MFN treatment to ensure Chinese investors enjoy MFN treatment during the admission phase; (2) Clarify direct and indirect expropriation concepts and criteria, particularly necessary given current international energy investment contexts; (3) Specify dispute resolution procedures and applicable arbitration rules, including explicit introduction of the International Centre for Settlement of Investment Disputes mechanism when revising the China-Turkmenistan BIT to enhance arbitration transparency and credibility; (4) Further clarify compensation standards, explicitly proposing “treatment no less favorable than that accorded to third-country investors or domestic nationals under similar conditions” and “restitution” standards; (5) Clarify investment admission exception clauses, striving to include energy sectors in exception clauses to provide Chinese investors with clearer policy expectations and more secure policy guarantees for energy investments in Central Asia.

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Author Biography

YANG Yu, Ph.D., Associate Professor at the Institute of Geographic Sciences

and Natural Resources Research, Chinese Academy of Sciences; member of the Youth Innovation Promotion Association and Regional Studies Association China Division. His research focuses on global energy geography and energy security. He has led or participated in over 30 projects from the Ministry of Science and Technology, Chinese Academy of Sciences, and National Natural Science Foundation, publishing more than 80 papers. E-mail: yangyu@igsnr.ac.cn

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