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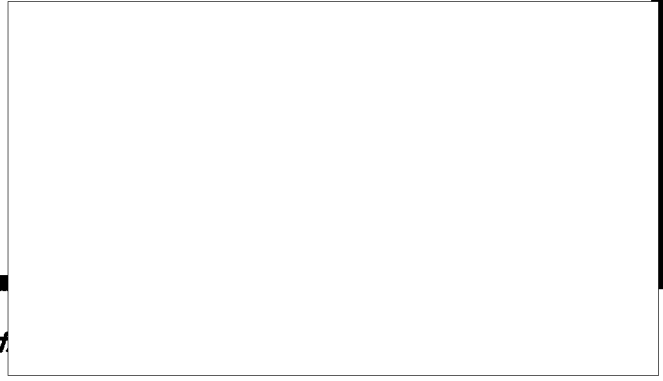
14 December 2001

China-Russia: Energy Linkages Slowly Developing



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China-Russia: Energy Linkages Slowly Developing [redacted]

Key Findings [redacted] Oil and gas exports from Russia to China are negligible but are likely to slowly expand over the next ten years.

- A proposed oil pipeline from Russia to China is more likely to be fully on stream in 2010 than a proposed gas pipeline.
- China currently does not need Russian oil and gas but is concerned about its growing dependence on Persian Gulf oil, which accounts for more than half of China's crude oil imports.
- Russia is the closest potential supplier of the large volumes of gas that China probably will import after 2010, given its plans to greatly increase natural gas use and modest gas resource base. [redacted]

Progress on building long-distance, high-capacity oil and gas pipelines from Russia to China will be slow until several key development challenges are overcome. These include deciding pipeline routing and financing, confirming sufficient Siberian oil and gas reserves to support the pipelines, and taking steps to develop China's market for natural gas.

- Beijing probably will not move quickly to resolve these issues because of its preference for developing domestic resources before foreign ones.
- Nonetheless, Chinese and Russian officials probably will continue their public support of the proposed pipelines because both see expanded energy trade as important to strengthening the Sino-Russian relationship, which is partly aimed at countering US influence, especially in northeast Asia. [redacted]

Both China and Russia oppose US companies participating in the construction and operation of Russia-China oil or gas pipelines if they cross Mongolia. However, the inability or unwillingness of Russian and Chinese oil companies to provide the necessary capital could open the door to US-company involvement. [redacted]

Selected Existing and Proposed Natural Gas and Oil Pipelines





China-Russia: Energy Linkages Slowly Developing



Energy Fundamentals Point to Expanded Sino-Russian Energy Trade



China's growing appetite for energy imports—oil in the near term, gas in the out years—could provide Russia with the opportunity to supply more oil and gas to China.

- We project China's reported total net oil imports (crude oil and product combined) of about 1.4 million barrels per day (b/d) in 2000 will reach 5-6 million b/d in 2010.¹
- Chinese officials and Western experts expect China to begin importing natural gas by 2010. We believe, based on the stage of gas import projects, that this initially will be as liquefied natural gas (LNG) rather than pipeline gas.

Chinese press reports indicate Beijing wants to increase oil imports from Russia to diversify its crude oil supply. Beijing may look to Russian crude oil imports as an added measure of energy security because much of its future oil supply will come from the Persian Gulf.

- The Persian Gulf provided China with more than half of its crude imports in 2000, according to official Chinese statistics, and Western energy experts project the share will reach 80 to 85 percent in 2010, according to oil industry press and

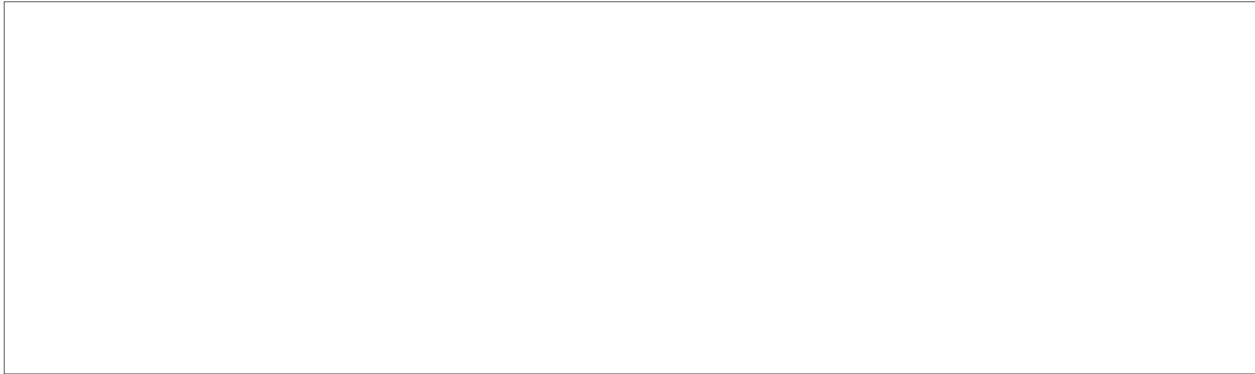


- Oil from these regions usually transits the Straits of Malacca and the South China Sea, and the PLA has only a modest ability to protect the lanes of communication in the South China Sea.



Russia is positioned to become a major supplier of projected Chinese natural gas imports after 2010 because of its substantial gas resource base and geographic proximity. Beijing has ambitious plans to increase natural gas consumption from about 25 billion cubic meters (bcm) in 2000 to 50 bcm in 2005 and as much as 100 bcm in 2010, largely to improve local air quality by displacing coal in the power, industrial, and urban residential sectors, according to press reports. Substantial gas imports will likely be needed to meet these goals because of China's modest proved gas reserves and lack of long-distance, high-volume transit pipelines to transport gas around the country, according to industry press.²

- We estimate China's proved gas reserves are about 1,000 bcm, approximately one-fifth of US proved reserves and 2 percent of Russia's proved reserves.
- China has only two long-distance gas pipelines—an 864-km pipeline from the Ordos Basin in north-central China to Beijing and a 778-km offshore pipeline from the Yacheng field in the South China Sea to Hong Kong and Hainan Island.







Chinese Reserves Less Than Meet the Eye

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Chinese press reports commonly claim discoveries of fields with "reserves" of more than a billion barrels of oil or hundreds of billion cubic meters (bcm) of gas. Upon closer examination, however, these claimed reserves generally appear very different from the proved reserves commonly used in the Western oil industry.


- *There is no universally accepted definition of proved reserves in the Western oil and gas industry, but the term commonly refers to discovered oil and gas that can be commercially produced using available technology under current economic conditions.* 

Beijing considers its oil and gas reserve estimates state secrets, but sporadic information in Chinese press reports indicate that the country's proved reserves are 15-17 billion barrels of oil and possibly as little as 900 bcm of gas, substantially less than the 24 billion barrels and 1,200-1,400 bcm commonly listed in Western industry publications.

- *In comparison, US proved oil and gas reserves were about 21 billion barrels and 4,650 bcm (164 trillion cubic feet) at the end of 2000, according to oil industry press reports.* 

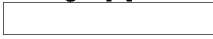
Many Western oil and gas geologists probably would categorize most claimed Chinese "reserves" as either resources or oil- or gas-in-place, much of which cannot be recovered for economic and technical reasons. As a conservative rule of thumb, about 35 percent of oil-in-place and 60 percent of gas-in-place typically can be extracted.

- *Initial Chinese reserves claims commonly are based on the results of a single well, an insufficient basis to make firm reserve estimates.* 

- *China's next large internal gas pipeline project is a proposed 4,200-km pipeline—with an estimated total project cost of \$12-14 billion—from Xinjiang to Shanghai, according to Western and Chinese press reports, but a lack of firm financing or developed markets makes it unlikely to be operating at its full design capacity of 20 bcm by the target completion date of 2005.* 

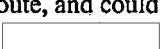

Large, long-distance oil and gas transit pipelines would have to be built for Russia to raise oil and gas exports to China substantially.

- *Russian oil exports now reach China by a complicated route involving pipelines, barges, trucks, and trains, which will not be able to handle large additional quantities of oil, according to oil industry press.*

- *There are no gas pipelines between Russia and China.* 

Russia-China Oil and Gas Pipelines Under Prolonged Discussion 

The Russian and Chinese Governments and oil companies since the mid-1990s have been considering the construction of pipelines to transport Russian oil and gas to China. Among several proposed projects, the "frontrunners" are an oil pipeline from Angarsk in East Siberia to northeastern China and a gas pipeline from Irkutsk in East Siberia to Beijing, with a possible extension to South Korea. These pipelines are more attractive than competing projects from West Siberia and Central Asia because of their shorter distances—and therefore lower construction costs—or location near more established resource bases (see map on page ii).

- *The 400,000-600,000 b/d Angarsk-China oil pipeline would be 2,300-2,500 km long, would cost \$1.4-\$1.7 billion depending on the route, and could be operational by 2005, according to*  *press reports.* 





Selected Proposed Routes for the Angarsk-China Oil Pipeline



Route	Origin	Destination	Volume (b/d)	Length (km)	Cost (billion US\$)
Across Mongolia	Angarsk	Beijing	400,000-600,000	2,300	1.4
Around Mongolia	Angarsk	Daqing	400,000-600,000	2,500	1.7



Selected Proposed Routes for the Irkutsk-China Gas Pipeline



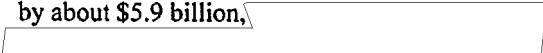
Route	Origin	Destination	Volume (bcm)	Length (km)	Cost (billion US\$)
Across Mongolia	Kovykta	Beijing	20-25	2,700	8-11
Around Mongolia	Kovykta	Beijing	20-25	4,500	10-13



- The 20-25 bcm Irkutsk-China gas pipeline would be 2,700-4,500-km long, cost \$8-13 billion depending on the route, and is targeted to be on stream by 2010, according to press reports



- An extension of the Irkutsk-China gas pipeline from Beijing to Pusan, South Korea would increase its length by about 2,000 km and its cost by about \$5.9 billion,



Progress on these proposed pipelines has been slow, however, with both projects only in the feasibility study stage. The latest of several feasibility studies on the Irkutsk-China gas pipeline began in early 2001, and is scheduled to be completed in the spring of 2002, according to press. During the July 2001 Sino-Russian summit, Russian and Chinese officials and executives from



Russia's second largest oil producer, Yukos; the Russian pipeline monopoly Transneft; and China National Petroleum Corporation (CNPC) signed an agreement for a feasibility study on an oil pipeline from Angarsk to northeast China. The study is to be completed by July 2002, according to Russian and industry press. [redacted]

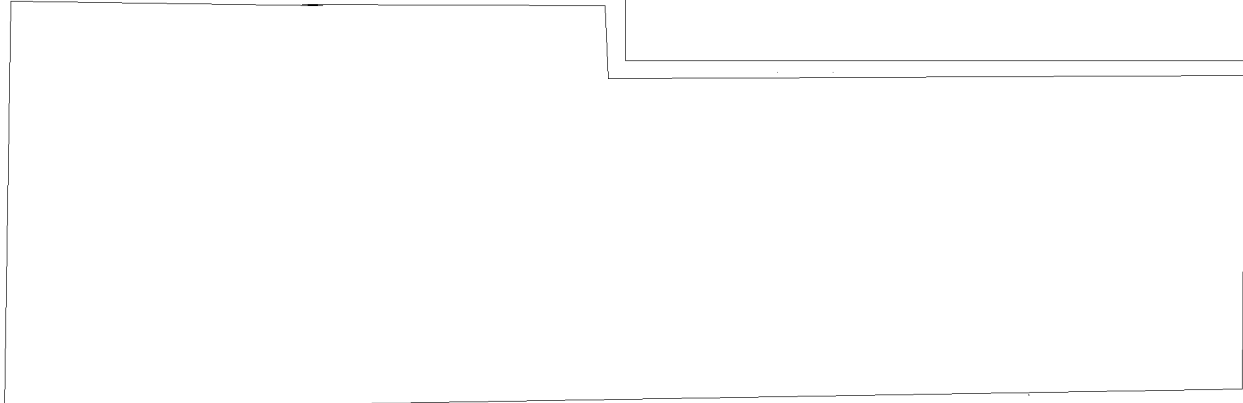
Challenges to Russian-Chinese Oil and Gas Pipeline Development [redacted]

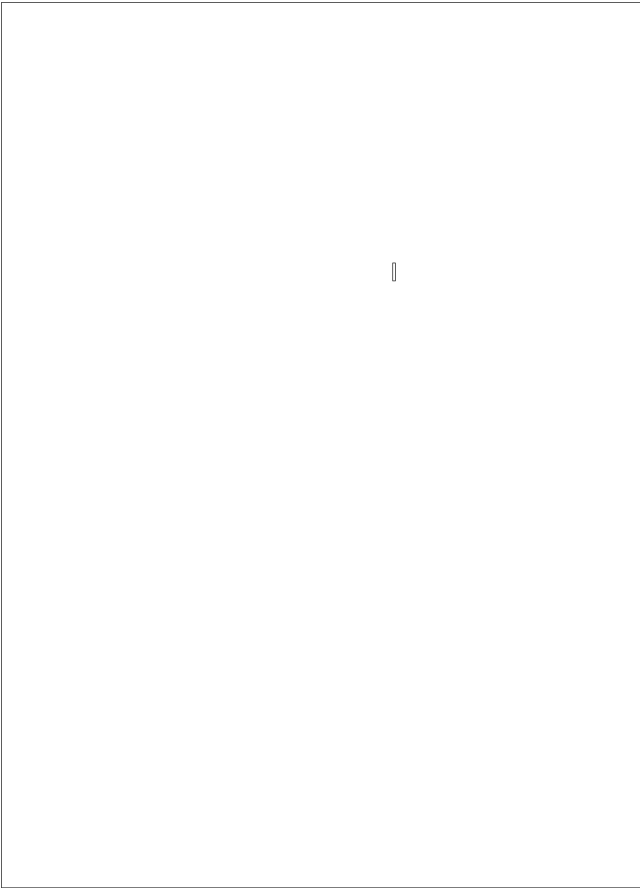
A number of obstacles have to be overcome before construction can begin on Russia-China oil and gas pipelines. Key issues include pipeline routing, financing, sufficiency of Siberian oil and gas reserves, and the size of the market for Siberian oil and gas in northeastern China. [redacted]

Undetermined Pipeline Routes


The key routing question for both the Angarsk-China oil pipeline and the Irkutsk-China gas pipeline is whether they will bypass or transit Mongolia. For the past several years, this has been a point of disagreement between China and Russia. However, press [redacted] reporting from mid-2001 indicate that the two sides are leaning toward the longer routes around Mongolia:

- The Sino-Russian agreement to conduct a feasibility study of the Angarsk-China oil pipeline indicates that a decision was made to study the route that bypasses Mongolia to Daqing—China's largest oilfield and a pipeline hub—according to press reports.





unable to independently fund these projects, and the Chinese appear reluctant to do so.


- Yukos probably does not have the means to finance the Angarsk-China oil pipeline by itself, according to press 



- According to Russian press reports, Beijing wants to independently finance and construct the Chinese portion of the pipeline, a plan which the Russian Energy Minister claims is "inadvisable from a technological standpoint." Beijing's interest in self-financing and construction probably is motivated in part by a desire to create jobs for Chinese citizens.

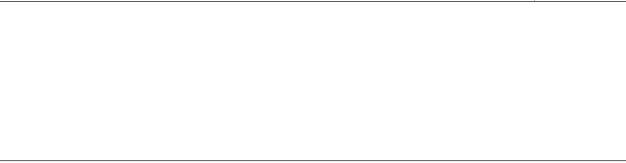



The participation of, or financing by, foreign companies in the proposed oil and gas pipelines will largely depend on the economics of these projects. BP, which has a 31-percent stake in the Kovykta gasfield near Irkutsk, and South Korea's state-owned Korea Gas Corporation (Kogas), are two possible sources of funding for a Russia-China gas pipeline.

A decision on whether the proposed Russia-China pipelines cross or bypass Mongolia has important implications for the future of these projects, especially the Irkutsk-China gas pipeline, because the feasibility of pipelines is generally distance-dependent—the shorter the distance, the more economic the project. A decision to build the pipeline around Mongolia could make securing external financing extremely difficult because of the \$2-5 billion higher cost of the longer route. 

Lack of Firm Financing

We have no indications that firm project financing for the proposed Russia-China oil and gas pipelines has been obtained. Russian companies probably are



-  the route around Mongolia would raise the gas price for South Korea to an uneconomic level. If pipeline gas costs more than LNG imported from Southeast Asia or the Middle East, South Korea probably will lose interest in the project, according to press reports.



Foreign companies will be more likely to help finance the proposed Russia-China pipelines if Beijing and Moscow create a more favorable foreign investment climate. According to [redacted] industry press, measures that both countries could take include strengthening the legal-regulatory framework, enforcing property rights, and applying nondiscriminatory policies to domestic and foreign bidders.

- The inability or unwillingness of Russian and Chinese oil companies to provide the necessary capital could open the door to US company involvement with pipelines that would be built across Mongolia. [redacted]

Beijing could also develop more competitive markets for natural gas. Low Chinese gas prices and an opaque pricing mechanism are major impediments to the involvement of foreign and Russian companies in the proposed Russia-China gas pipeline. China historically has set domestic gas prices well below world levels because about 40 percent of gas production is used to produce fertilizer for low-income farmers.



Pipeline Oil and Gas Supplies Uncertain

It is unclear whether Russia can now provide sufficient oil and gas for the proposed Russia-China pipelines. The Kovykta gasfield, expected to be the main gas supplier to the Irkutsk-China pipeline, is still under evaluation and—despite claimed “reserves” of 1,200-2,000 bcm—has only 340 bcm of proved reserves, according to press reports. [redacted]

Russian Energy Politics [redacted]

The relationships between Moscow and Russian energy companies interested in participation in the proposed Russia-China oil and gas pipelines could have a critical impact on the pace of the development of these projects. Yukos, Russia's second largest producer of oil, has considerable political clout, which it could use to pressure Moscow to lend political weight to the Angarsk-China oil pipeline. Moscow could lean on Gazprom, the state-owned gas monopoly, to invest in the Irkutsk-China gas pipeline to further Russia's foreign policy objective of closer ties to Beijing.

- In May 2001, Russian President Vladimir Putin appointed his acolyte Aleksey Miller to be head of Gazprom, a position Miller is likely to use to strengthen relations with China and other countries important to Putin, [redacted]

Yukos and Gazprom are outwardly eager to supply oil or gas to China. Yukos regards the proposed Angarsk-China oil pipeline as important to the expansion of its exports to China, and Gazprom views the proposed Irkutsk-China pipeline as a way to gain a foothold in China's potentially huge gas market.

- The small quantities of oil Yukos exports to China, about 10,000 b/d in 2000, which the firm plans to quadruple by 2002, are aimed at establishing a good relationship with China to facilitate the construction of the Angarsk-China oil pipeline, according to Russian press.
- Gazprom and two major Western oil companies are in discussions with PetroChina, China National Petroleum Corporation's domestic subsidiary, over participation in the proposed Xinjiang-Shanghai gas pipeline, according to press reports. [redacted]

Gas Pipeline Faces Limited Competition from LNG [redacted]

Beijing's plans to begin importing liquefied natural gas (LNG) by 2005 probably will have only a minor impact on the proposed Irkutsk-China gas pipeline because the projects will supply different markets. Construction of a proposed 3 million ton/year (equivalent to about 4.2 billion cubic meters (bcm) of gas) LNG terminal, with an associated power plant and 400-km pipeline grid, in Guangdong Province is to begin in the second half of 2002 with a target completion date of 2005, according to press reports. Beijing in March 2001 selected BP-Amoco as the foreign partner for the terminal construction for this project. Australia, Indonesia and Malaysia are leading potential LNG suppliers.



The Guangdong LNG project probably will be on stream before the Irkutsk-China gas pipeline because of its likely shorter construction leadtime and more promising market. LNG imports would supply southern coastal China, which has the country's highest energy demand but few energy resources.

- *Guangdong can purchase oil and gas on the world market for less than on the domestic market because its location far from China's energy producing regions results in high transportation costs.* [redacted]

LNG imports will not eliminate the need for pipeline gas imports in the long term should natural gas consumption in China increase substantially. Western energy specialists believe that if China develops a natural gas grid, then it will need pipeline gas, because natural gas, for which Russia is a clear nearby source, is much less expensive to deliver by pipeline than as LNG after a transmission and distribution system is in place, according to press reports. [redacted]

LNG and pipeline gas imports will also compete for different markets in China. LNG imports probably will be limited to southern coastal China because of the deep ports needed for LNG carriers, [redacted] [redacted] By contrast, pipeline gas imports will supply interior and northern China, according to Chinese industry press. [redacted]

[redacted]

- A Russian press report indicates that 1,000 bcm of proved reserves are needed to support a pipeline to China, and another press report lists 1,500 bcm as the minimum amount required.

[redacted]

Limited Short-Term Chinese Demand for Russian Energy

Middle Eastern and Southeast Asian oil will probably be less expensive than Siberian crudes in China, especially in the southeast, where oil demand is highest.

- A study by Transneft indicates that the cost of shipping oil by pipeline from oilfields in Russia across Mongolia to the China border exceeds the cost of shipping oil from the Persian Gulf to China, according to Russian industry press.
- Both Beijing and Daqing are far from the oil-hungry consumption centers along China's southeast coast, and would require costly additional transportation to supply this market [redacted]

The undeveloped Chinese gas market cannot support Russian pipeline gas at present. Gas accounts for only 2 percent of China's current energy consumption, and the 20-25 bcm that the proposed pipeline would provide matches what China used in 2000. Chinese officials have announced gas consumption targets of 70-100 bcm for 2010, but have been vague about the specific steps they will take to reach this objective. [redacted]

Russia-China Electric Power Transmission Line on the Backburner [redacted]

Sino-Russian discussions about a proposed power transmission line from Bratsk in eastern Siberia to Beijing or Shenyang via Mongolia have stalled because of a lack of Chinese interest. China and Russia held negotiations on the power transmission line in 1997, and United Energy System (UES) of Russia and the Chinese State Energy Company signed a protocol on cooperation for construction in April 1999. National People's Congress Standing Committee Chair Li Peng in September 1999 told the president of UES that China did not need Russian electricity and that no joint projects would be developed in the immediate future, according to press.

- *The proposed 2,000 to 2,600 km powerline would cost \$1.5 billion and could transmit 10-18 billion kilowatt-hours per year, based on a survey of press reports.* [redacted]

[redacted]



Beijing may also postpone making a firm commitment to the proposed oil and gas pipelines in order to concentrate on the exploration and development of domestic energy resources.



- Beijing has had a longstanding publicly stated preference for the development of domestic energy resources over foreign energy resources.
- We have no indication that either Russia or China has made firm arrangements for financing the Angarsk-China oil pipeline.

Implications for China, Russia,



Oil and gas trade between Russia and China will affect political and economic relations among Russia, China, and Mongolia, and could have both a direct and indirect effect on US policy efforts in the region.



China

Even though an oil pipeline from Russia to China is much more likely to be operating by 2010 than a gas pipeline, gas pipelines probably will be more important to China's energy supply in 2020 and beyond.

Pipeline oil from Russia would only modestly reduce China's dependence on seaborne oil imports from the Persian Gulf and Africa.

- The 400,000 b/d of crude oil from the proposed Angarsk-China oil pipeline would be 8 percent or less of China's total net oil imports, or 5 percent of total oil consumption in 2010, according to CIA projections.

In contrast, China could rely on Russia for a substantial share of its gas supply by 2020. Chinese energy officials and industry executives acknowledge that China will need to import 50-100 bcm—or 25 to 65 percent of consumption—by 2020 to meet

Beijing's stated gas consumption targets of 155-200 bcm, according to press reports



- Two 25-bcm pipelines can supply 50 bcm, compared to 12 import facilities of 3 million metric tons (equivalent to 4.3 bcm) each that would be needed to supply a similar amount of gas as LNG.



Despite the modest share of China's oil that an oil pipeline from Russia could provide over the next decade or so, Russian energy would provide Beijing a measure of energy security. Oil carried by these pipelines will avoid seaborne transportation vulnerabilities, and we have seen little indication that China's leadership is greatly concerned about Russia's reliability as an energy supplier.



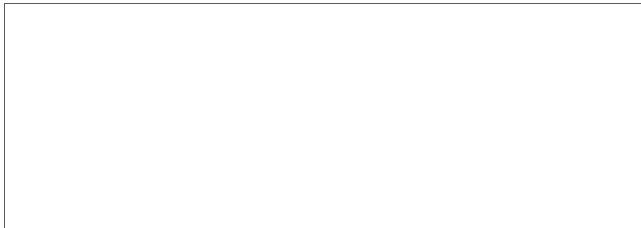
Greater energy cooperation with Russia could help Beijing maintain good relations with Moscow—a key arms supplier—by helping to raise low levels of trade, which have been a chronic irritant in bilateral ties. Beijing also sees Russia as a focal point in its diplomatic efforts to check US dominance.



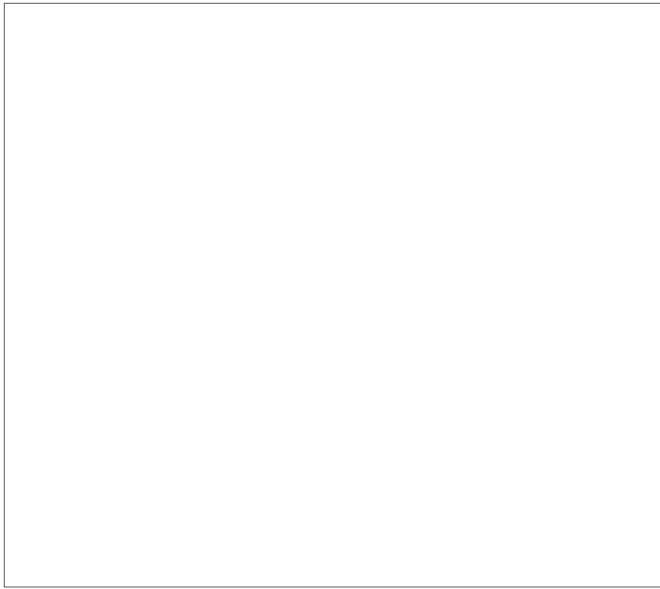
Russia

Increased energy exports to China would spur development of the vast resources of Siberia and the Russian Far East. Boosting oil and gas shipments to China would yield political as well as economic dividends, creating jobs that could stem the population decline threatening Moscow's grip east of the Urals.

- Large-scale energy shipments to China would also serve Moscow's goal of fleshing out the Russo-Chinese "strategic partnership" by increasing nonmilitary trade. Moscow, like Beijing, sees this partnership as an important brake on US actions, especially in northeast Asia.



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