

Testimony Before U.S.-China Economic and Security Review Commission
Hearing on China's Energy Plans and Practices

March 17, 2022

Panel II: China's External Energy Policies

Edward C. Chow

It is my honor and privilege to testify before this Commission.

We meet at a time when world energy markets are experiencing the greatest turmoil in more than forty years. In my four and half decades as a practitioner in and observer of the international oil and gas industry, there has not been such a seismic event since the twin oil shocks of the 1970s. Reverberations from Russia's unprovoked and unjustified war against Ukraine will be with us for years to come. Until now, Russia is the world's biggest exporter of oil and gas combined. There are no ready substitutes for Russian volumes in the global market. It is as if the availability of Saudi oil and Qatari gas were both put into question at the same time.

The Commission staff asked me to focus on China's energy relations with Russia. Every country will have to recalibrate their external energy relations not only with Russia but with the rest of the world, not least of all China which is the biggest importer of oil and gas combined. Immediately after a geopolitical shock, one must resist the temptation for instant analysis that happens to fit into one's worldview. I am afraid this has been the tendency in Washington of late across administrations and congresses, especially on energy. The seismic shift set in motion will take years if not decades to play out since nothing happens quickly in the energy industry, much to the dismay of policymakers. It is impossible to forecast the end state while all countries are reexamining previous assumptions about global energy and recalibrating their policies.

At this time, it is best to assess objective facts based on first principles, which is what I will try to do here, and not to draw premature conclusions.

After more than four decades of historically unprecedented economic growth, China is the second largest economy of the world and its largest energy consumer. Growth was driven initially by agricultural production and light manufacturing. However, much of economic growth in the second half of this period was compelled by energy-intensive heavy industry and infrastructure investments. China became a net oil importer in 1993. Although the Chinese petroleum industry maintained the level of domestic oil production and increased gas production, it has not kept pace with burgeoning demand. By 2013 China became the largest net oil importer, surpassing the United States. More recently it became the largest importer of natural gas even though gas consumption remains low by world standards.

Overreliance on domestic coal, which still represents much more than half of energy consumption, severely damages the environment and the health of the Chinese population in ways that are increasingly unsustainable and politically unacceptable. Although high energy demand growth will ease with economic transition to the expanding service sector, Chinese oil and gas import dependence will continue to grow in the foreseeable future, albeit at a somewhat

slower pace. Today the average Chinese consumes less than 40% energy than the average American and less than two-thirds of average citizens of OECD countries.

Import dependency for oil has reached a dangerously high level of 70%. The vast majority of China's imported oil comes from distant sources and is transported through maritime routes over which China as-yet has little control and can be subject to interdiction by a hostile navy. In many respects, China's oil import vulnerability is much greater than this ever was for the United States because most American imports came from the Western Hemisphere, i.e., Canada, Mexico, and South America. Chinese oil imports come primarily from far away and more volatile regions of the Middle East and Africa, where China cannot project power currently to protect oil flows.

Since the largest oil and gas importer and the largest oil and gas exporter in the world – Russia – share a common border, one would think that this is an energy match made in heaven. Moreover, Russia is highly dependent on Europe as the destination of its oil and gas exports for reasons of geography, geology, and history. Europe is much closer to Russia's traditional oil and gas producing provinces and infrastructure was built even during the Cold War to transport Russian oil and gas to markets in Europe. However, demand for oil and gas in Europe is stagnant to declining for economic, demographic, and climate change policy reasons. Development of new Russian producing provinces such as East Siberia and the Arctic region will depend on finding new markets where demand for oil and gas is still growing.

Objectively, it serves both Russia and China's interests to diversify respectively their oil and gas export markets and supply sources, as well as supply routes. The need for diversification grew more urgent for Moscow in 2014 when Western economic sanctions were imposed because of Russian aggression against Ukraine. This need will become much more acute after Russia launched its all-out war against Ukraine on February 24. European countries will want to reduce their reliance on Russian oil and gas imports, restrict investments, and limit exports of oilfield equipment and services to Russia. Where will Russia get the capital and technology needed for its most important industry, which at peak represented half of central government revenue and two-thirds of export earnings? The risk premium for all Western companies to do business in Russia, including or especially in oil and gas, just jumped.

At the same time, heightened concerns in the West over China's rise (or renaissance in Chinese minds) and increasingly assertive behavior abroad caused Beijing to reassess its dependence on an open international market to supply it with oil and gas. Equity oil from Chinese companies operating overseas, bilateral deals with friendly governments, and land-based pipelines all become more important in the face of American penchant for trade restrictions and unilateral, extraterritorial economic sanctions, such as those on Iran. This was true even before Washington's so-called Indo-Pacific strategy to contain China through a series of regional alliances and partnerships.

Unfortunately for Russian and Chinese strategic planners and policymakers, their dream of connecting the two economies through oil and gas flows runs into the harsh economic realities and commercial logic of the petroleum industry. The Soviet Union had planned to ship West Siberian oil to China, but this was never realized. Fact is the Chinese market is at least three times farther away from Russia's oil and gas producing regions than main European markets.

Industry fundamentals call for pipelines to be built to where producers can gain the highest price after subtracting the cost of transportation (“netback to wellhead”).

Diversification may be desirable strategically for both Russia and China, but it requires the building of expensive new infrastructure and can result in earning lower revenue due to high transportation cost. The financial risks of investing tens of billion dollars demand complicated commercial negotiations. Generally speaking, oil pipeline deals are easier than gas deals to conclude, as transportation costs represent a smaller portion of the end value and oil is more easily traded to other markets. Oilfield development can start before the final market and transportation method are determined. New gas field development from a remote area does not start until there are sales contracts with creditworthy buyers who are willing to provide adequate financial guarantees.

The idea of an oil pipeline from Siberia to China was revived in the mid 1990s, but it took years to negotiate. A deal was concluded finally in 2009 with China providing loans to Transneft, the Russian state-owned oil pipeline monopoly, and Rosneft, the majority state-owned Russian oil producer, totaling \$25 billion. Oil from the pipeline started flowing directly to northeast China in 2011 and almost immediately an oil price dispute broke out, which illustrates the commercial complexities of such bargains. The pipeline was further extended to the Pacific Coast in 2013 (replacing shipments by rail) so that Russian oil can be sold from there to other Asian markets, particularly Japan and South Korea.

Despite initial difficulties, the East Siberia Pacific Ocean (ESPO) pipeline with a current capacity of 1.6 million barrels per day provides real benefits to Russia and China and even to the Asian oil market as a whole. With the arrival of a major new crude supply, the so-called Asian premium charged by Persian Gulf producers to Asian buyers narrowed and practically disappeared. Today Russia and Saudi Arabia compete to be China’s largest oil import source as both countries recognize China as the premium growth market, particularly when compared with the less friendly West. This competition has geopolitical overtones not unlike in the 1970s when Iran under the Shah and Saudi Arabia competed to be the second largest (after Canada) oil exporter to the United States.

Diversification costs, but if state-owned and controlled companies are willing and able to pay the price, then strategic projects can be realized. The success of ESPO allowed both Russia and China to proceed with a more economically challenging gas pipeline project. The so-called Power of Siberia contract was signed in Shanghai in May 2014 between Gazprom, the state-controlled Russian gas giant, and China National Petroleum Corporation (CNPC) under the watchful eyes of presidents Vladimir Putin and Xi Jinping. This deal took ten years to negotiate. It is questionable whether it would have been done still if not for Putin’s urgent need to show Russia cannot be isolated after the imposition of Western sanctions due to its illegal annexation of Crimea and hostile actions in the Donbas region of Ukraine.

Gazprom’s investments in two gas field developments in East Siberia and the pipeline to northeast China were supposed to cost upward of \$55 billion. Development of the two fields, Chayanda and Kovykta, is critical for linking the infrastructure of East Siberia and the Russian Far East, a national priority, and would not be possible without the export market in China.

Interestingly, there was no offer of Chinese loans this time, only a guarantee to purchase up to 38 billion cubic meters per year (bcma) of natural gas under an agreed pricing formula.

It is difficult to evaluate the commerciality of Power of Siberia from the outside since it is impossible to know all the elements included in a package under the direction of the two countries' presidents. What we do know is, around the same time, China agreed to be the first foreign purchaser of Russia's most advanced S-400 air defense system. Indications are that the Chinese side did a good job in negotiations with China paying a fraction of the gas price Europe currently pays for Russian gas.

The Power of Siberia story reveals the inherent vulnerability of such deals: they take a long time to negotiate, finance, and complete; project costs and financial risks are high; market conditions will change in a notoriously cyclical industry; political guidance may make deals easier to make but does not guarantee commercial success, in fact it may do the exact opposite. Power of Siberia finally started flowing a small volume of gas to China at the end of 2019 and is still not at full capacity today.

It may, however, presage things to come for Russian-Chinese gas trade. On February 4, when Vladimir Putin visited Beijing before the Winter Olympics, Gazprom and CNPC signed a 10 bcma deal for gas from Sakhalin Island to China. The unsuspecting general press bought the Russian narrative that this is an important step in deepening its energy relations with China. Meanwhile some of us wondered what happened to the 50 bcma Power of Siberia II project that is supposed to bring Russian gas all the way from the Yamal Peninsula through Mongolia to China. Gazprom had completed the feasibility study for the Mongolian segment at the end of last year and I at least expected a deal to be signed when Putin visited Beijing.

One can only surmise that China did not agree on gas price and Chinese negotiators believed that time is on their side in the negotiations. With new intensive Western sanctions against Russia because of its brutal war against Ukraine, including the suspension if not cancellation of the recently completed Nord Stream 2 pipeline to carry gas from the Yamal Peninsula under the Baltic Sea to Germany, and European reluctance to prolong its dependence on Russian gas, Russia will look desperately for alternative export markets as well as sources of capital. It may be that this new 50 bcma deal will be signed between Russia and China when Putin next meets Xi (they have only met 37 times in the last ten years), but one suspects the terms will be in China's favor.

It is telling that neither the Russian oil pipeline nor gas pipeline projects went forward until after China first built pipelines from Central Asia. The Kazakhstan to China oil pipeline was completed in 2005 with a further extension finished in 2009. The first gas pipeline from Turkmenistan through Uzbekistan and Kazakhstan to China was completed in 2009 with two additional lines built in quick succession.

For China, the big difference is Kazakhstan and Turkmenistan welcomed Chinese equity investments in oil and gas fields whereas Russia resisted initially granting large upstream ownership rights to Chinese companies, preferring instead long-term supply contracts and loans. In Central Asia, China was given opportunities in the more lucrative part of the oil and gas

business, exploration and production. In Russia, it was merely a purchaser of oil and gas. For Central Asian countries, China represented an alternative to reliance on Russia as their only export route for oil and gas. In fact, for Turkmenistan, China replaced Russia as the offtaker of almost all its gas.

Competition between Russian and Central Asian oil and gas favors China. It is able to drive advantageous bargains with Central Asian countries that seek financing and options to balance Russian dominance. Contracts in Central Asia allow China to wait for the right commercial deals with Russia. Tension may yet emerge between Russia and China over conflicting interests in Central Asian oil and gas. It will be interesting to see if and how Russia asserts its influence in Central Asia with the full development of the Kashagan oilfield in Kazakhstan and the Galkynysh gas field in Turkmenistan, two world-class projects of interest to China.

It is useful to note that Chinese activities in Central Asian oil and gas and Russian interest in supplying the Chinese market with its own oil and gas long preceded President Xi Jinping's 2013 announcement in Kazakhstan of China's policy for the New Silk Road, subsequently renamed One Belt One Road and now Belt and Road Initiative (BRI). Development of oil and gas relationships coincided more with the creation of the Shanghai Cooperation Organization in 2001, which essentially recognized Chinese economic interests in Central Asia without challenging Russian political interests.

The real connection between oil and gas and BRI is that these are resources that China needs and wants to invest in Central Asia, Russia, and elsewhere. To the extent that oil and gas projects are profitable, they help pay for other projects with a lower or marginal economic return, such as in infrastructure, and income from oil and gas allows countries to buy more Chinese goods and services.

However, pipelines from Russia or Central Asia suffer one major commercial disadvantage. They only bring oil and gas to the relatively poor interior regions of China and the Chinese rust belt in the northeast. The more prosperous premium markets are in the central and southern coastal areas of China that enjoy easy access to seaborne cargoes of oil and liquefied natural gas (LNG) from the world market that are much more flexible commercially and favored by traders.

Belatedly, Russia made large investment opportunities available to Chinese companies. In 2013, CNPC bought 20% of the \$27 billion Yamal LNG project, majority-owned and operated by the "independent" Russian gas company Novatek. When an additional 9.9% stake became available the next year, a Chinese policy bank, the Silk Road Fund, stepped in to purchase the interest. Yamal LNG shipped its first cargo in 2017. In 2019, Novatek and partners made the final investment decision on a separate \$21 billion LNG project named Arctic 2. CNPC and China National Offshore Oil Corporation (CNOOC) each own 10% of Arctic 2. In buying into these two large LNG projects, Chinese companies are pursuing a classic strategy of major LNG buyers to "claw upstream," as they had already practiced in Australia and elsewhere.

LNG made the Northern Sea Route more economically important to Russia and China as it has the potential to shorten the voyage time between the Yamal Peninsula and northeast Asia. For

Russia the Northern Sea Route is also militarily important for its control of the Arctic region and for China it strengthens its claim to be a near-Arctic nation.

These projects may also indicate a preference by Chinese companies to deal with private Russian companies, such as Novatek, with theoretically the same profit motivation and interest in cost control as they do. No doubt the presence of a major European oil company, Total, and the extensive use of Western contractors in both projects gave additional comfort. All this may change with new Western sanctions (including by Japan) against Russia for its war against Ukraine.

National champion companies such as Gazprom and Rosneft tend to have their own peculiar *modus operandi* and are measured differently by their majority owner, the state. The Chinese companies understand this all too well from their own domestic experience and years of negotiating with Russian state companies. Chinese national champion companies have to be internationally competitive to survive and learned from bitter experience in places like South Sudan and Venezuela. The Russian national champions enjoy homefield advantage in exploration and production, prospects of which are scarce inside China. There may be limits to the country risks that Chinese companies are willing to entertain in Russia.

Chinese companies continue to spread their economic interests in other oil and gas producing countries in the Persian Gulf, Africa, and South America. China cements increasingly close working relationships with Russia's strategic competitors in Saudi Arabia, Iran, and elsewhere in the oil patch. It will seek to gain long-term advantage by doing so and not just for short-term tactical advantage as often seems the case for Russia. For example, Saudi Arabia is China's largest oil supplier and holder of the largest, most economic-to-extract crude oil reserves in the world. Iran is the largest reserve holder of oil and gas combined. Access to resources in the Persian Gulf will remain important to China regardless of its energy relations with Russia. Relationship with Venezuela is trickier because, even though resources are large, the oil is harder to extract and less valuable, and the politics is messier. China will continue to pay attention to oil and gas producing countries in West and East Africa.

At the same time, China is in the forefront of the global energy transition. It is the largest producer of renewable energy from wind and solar. It is the largest producer of electric cars. It is the largest builder of new nuclear power plants. As part of its innovation strategy, it invests heavily in research and development of new energy technologies whether they are in clean coal, carbon capture and sequestration, batteries and other energy storage, super grids for long-distance electricity transmission, advanced materials, robotics, artificial intelligence and computing power for energy applications. China does this partly but not solely because it recognizes its overdependence on oil and gas imports and the security vulnerability this causes. For energy transition, China has the advantage of economic scale in a manner no country has enjoyed since post-World War II America.

Although China and Russia's energy interests converge in the short to medium term, they may well diverge in the long run. China wants to be the global leader in a post-oil and gas world. Russia wants the petroleum era to last for as long as possible. Not only is it the key sector of its economy, oil and gas help Russia to punch above its economic weight internationally. If the

global economy actually moves beyond fossil fuels (which still represents more than 80% of global energy consumption), the Russian and Chinese economies will have much less to offer each other. Russia would have little to sell China and less money to buy from China.

China's decades-long reform path is based on opening to the global economy. Success in reform allowed China to build an internationally competitive economy that relies on open markets to supply its ever-increasing demand for petroleum and other natural resources. Chinese equity investments abroad represent a small share of the oil and gas it imports. Its energy interests are not so different from Europe or Japan's. As the world's largest merchandise trader, a functioning international trading system is fundamental to Chinese prosperity. China does not want to overturn the international system; it wants to inherit it or at least be one of the rule setters. China aspires to be a standard bearer of the new global economy.

Russia under Putin is a revanchist power, which sees the very existence of the international system, led by the United States, as unfair to Russian interests. It sees oil and gas as one of the few tools, besides military force, it has to protect and advance its regional and global interests. It prefers bilateral arrangements rather than multilateral institutions to achieve its objectives, including in energy.

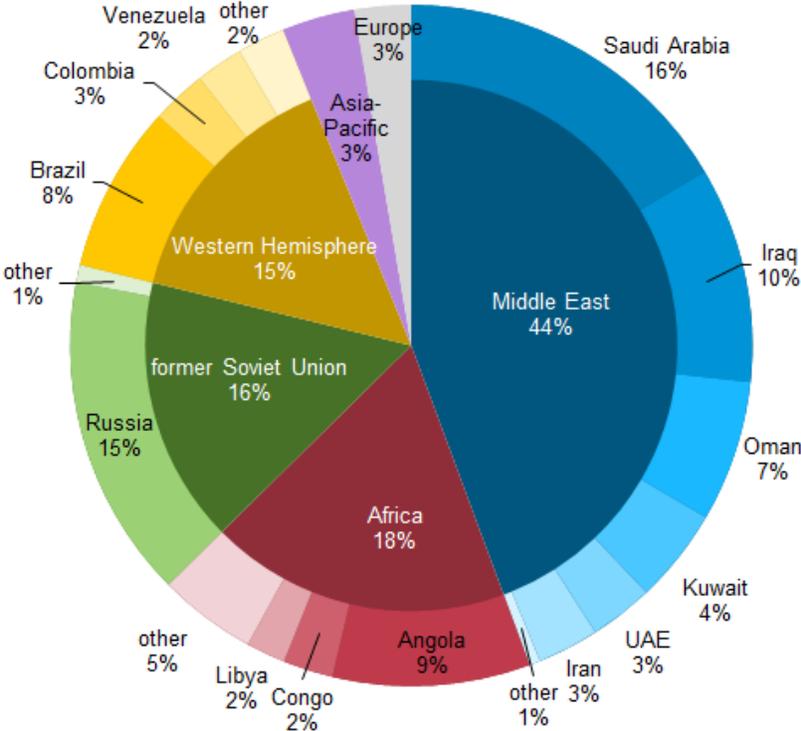
Thus, the two countries present very different challenges to U.S. power. A more thoughtful and nuanced American foreign policy would try to accentuate divisions between the two instead of unintentionally pushing them together. As the two largest economies and energy consumers in the world, America and China have overlapping interests in energy innovation. On current trajectory, we appear destined to compete in this space rather than to cooperate as we once tried to do.

Sino-Russian relations may be a marriage of convenience arranged by oil and gas. However, arranged marriages have a way of lasting. Over time, one gets used to the other's annoying habits and understands the other side better. One becomes attached to the progeny that comes from the relationship. It is particularly helpful if there is a common enemy, like an overbearing neighbor.

Both presidents Putin and Xi have declared the current state of their two countries' bilateral relationship as the best in history. More of their citizens are learning each other's language, exchanging visits, studying and doing business together than even in the peak of 1950s period of fraternal Communist friendship. There are other fruitful areas for cooperation, such as in military technology. Energy trade facilitates the deepening of their relationship.

Their respective attitudes toward the United States play a contributing if not decisive factor. American policy can choose to see the Russian and Chinese challenge to American power as essentially the same and draw them closer or pursue differentiated policies that tries to separate the two. Energy is a good place to start recognizing their differences.

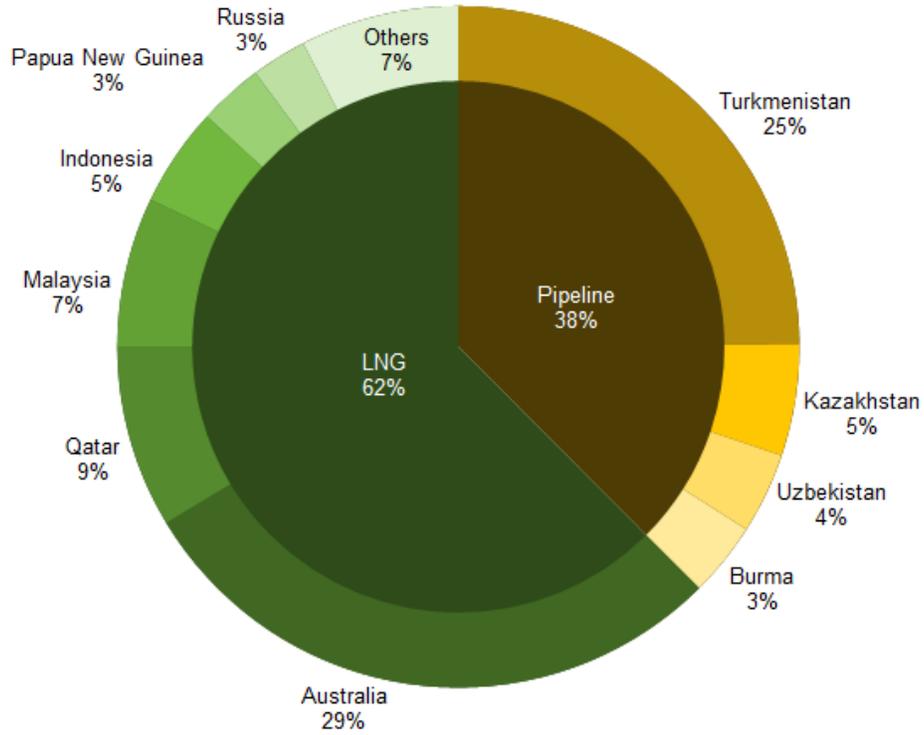
Figure 3. China's crude oil imports by source, 2019



Source: FACTS Global Energy Services, *China Oil Monthly*, February 2020

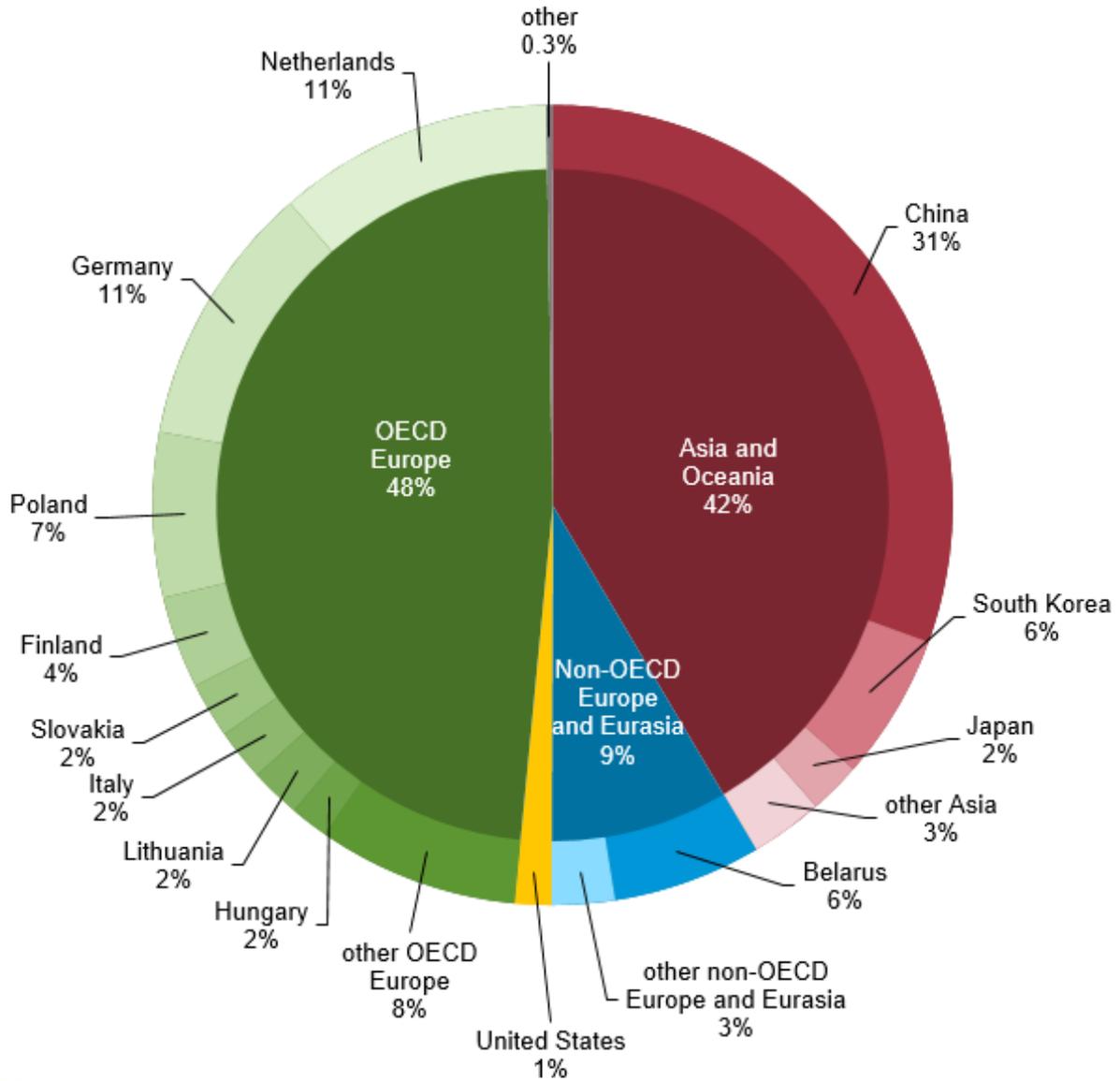
Note: Total may not equal 100% because of independent rounding.

Figure 3. China's natural gas imports by source, 2019



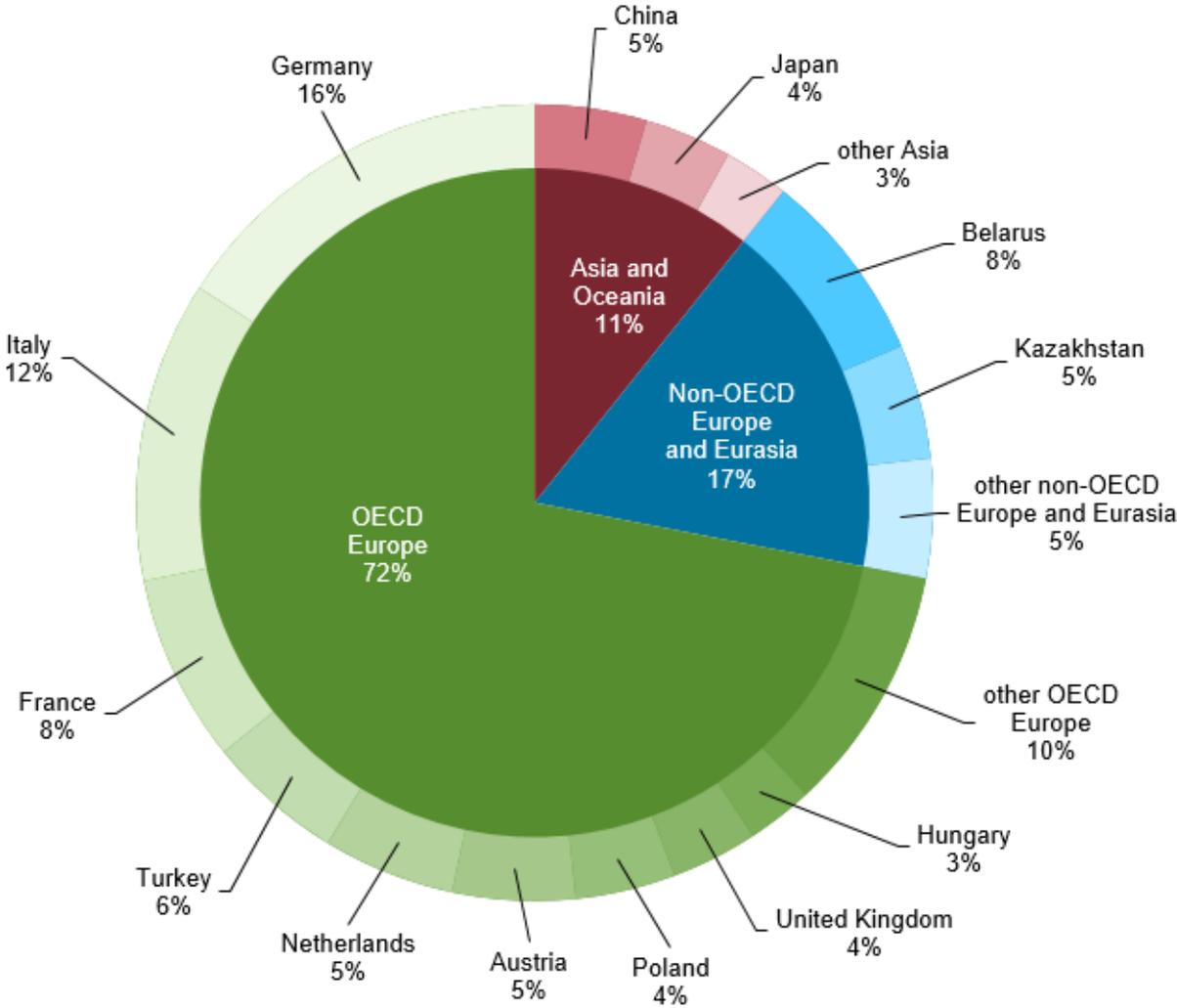
Source: Global Trade Tracker
Note: Total may not equal 100% because of independent rounding.

Figure 2. Russia's crude oil and condensate exports by destination, 2020



Source: Graph by the U.S. Energy Information Administration, based on Russian export statistics and partner country import statistics from Global Trade Tracker

Figure 6. Russia's natural gas exports by destination, 2020



Source: Graph by the U.S. Energy Information Administration, based on Russian export statistics and partner country import statistics from Global Trade Tracker and on delivery statistics from Gazprom