



ENERGY LEADERSHIP

How American Energy Production Can
Make The World Safer

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Energy Leadership

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Executive Summary

- » **Russia is a major global supplier of energy. The European Union relies on Russia for more than one-quarter of its crude oil imports, making it the bloc's largest single energy source.** Germany, Europe's largest economy, gets more than half of its natural gas and more than 30 percent of its crude oil supplies from Russia.
 - » **This gives Russia strategic leverage over these countries.** As late as March 7, eleven days into Russia's invasion of the Ukraine, Germany's Chancellor, Olaf Scholz, suggested that Germany would not support energy sanctions on Russia, explaining that Russian energy imports are of "essential importance" to daily life there.
 - » **But Russia's dependence on its exports of energy is also a source of potential weakness.** In 2021, revenues from oil and natural gas made up 45 percent of Russia's federal budget and exports of crude oil, petroleum products, and natural gas accounted for 45 percent of its total exports.
- » **These exports are a crucial source of foreign currency for Russia.** The U.S. dollar and euro account for the invoicing of 36 and 31 percent of Russia's imports respectively. To get the dollars and euros necessary to fund these purchases, Russia relies on its exports of energy. They are responsible for the entirety of Russia's current account surplus.
 - » **The imports these exports pay for are crucial to some of Russia's most important industrial sectors.** In 2021, machinery, equipment, and vehicles accounted for 40 percent of total Russian imports with chemicals and food making up another 24 percent. In certain key manufacturing sectors, imports represent between 55 and 75 percent of the value added in the sector's final demand. The share of imports was highest in sectors of machinery & equipment and computers & electronics.

Introduction

On February 24, Russia invaded the Ukraine. This unjustifiable act of aggression drew widespread condemnation from the international community. In an emergency session on March 2, 141 of the United Nations' 193 member states voted to condemn the invasion, with 35 abstaining and just five voting against the resolution.¹

Even so, when it came to coordinating an effective response, many countries found their hands tied by their reliance on energy imported from Russia. Russia supplies about one-third of the natural gas consumed in Europe where it is used for everything from winter heating to electricity generation and industrial production. The European Union also relies on Russia for more than one-quarter of its crude oil imports, making it the bloc's largest single energy source.² Some countries are especially dependent. Germany, Europe's largest economy, gets more than half of its natural gas and more than 30 percent of its crude oil supplies from Russia.³ So, as late as March 7, eleven days into the war, Germany's Chancellor, Olaf Scholz, suggested that Germany would not support energy sanctions on Russia, explaining that Russian energy imports are of "essential importance" to daily life there.⁴

There is little doubt that Vladimir Putin's regime has deliberately sought to use its energy exports for strategic leverage. A substantial amount of evidence strongly suggests that the Russian government provided covert funding

for the anti-fracking movement in the United States and Europe, "to maintain dependence on imported Russian gas," according to former NATO Secretary General Anders Fogh Rasmussen.⁵ In 2016, former Secretary of State Hillary Clinton reported: "We were even up against phony environmental groups, and I'm a big environmentalist, but these were funded by the Russians..."⁶ The environmental movement in

the West have not been 'useful idiots' for Putin's regime, they have been indispensable idiots.

But this source of strategic strength for Russia is also a potential source of great weakness. Exports are the price a country pays for its imports and Russia's energy exports pay for a range of imports which are vital to the country's economy. If the revenue from Russia's energy exports can be reduced by reducing the global price of energy significantly, then not only will the world benefit from a positive shock on the supply side of the economy, but the

ability of Putin's regime to finance its wars of conquest in the Ukraine and elsewhere will be severely curtailed.

This crisis has brought policymakers in a number of countries to the belated realization that depending on a regime like that of Vladimir Putin for essential energy supplies is a bad idea. Italy is considering reviving its coal plants⁷ and so, too, is Germany.⁸ The United Kingdom is mulling the return of fracking.⁹

This paper goes beyond that, however. We do not set out a plan for American energy

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independence with the aim of insulating the United States from the kind of leverage being exerted on policymakers like Olaf Scholz. Rather, we make the case for a bolder strategy: using the ability of the United States to produce cheap energy in abundance to lower global energy prices and pry a key source of strategic leverage from the hands of Vladimir Putin.

First, we outline the vulnerability of the Russian economy to such a strategy. Second, we

explain why a shift to ‘renewables’ in the United States will not be anywhere near sufficient to execute this strategy, at least in a useful time-frame – indeed, such moves are the source of many of the woes currently facing countries like Germany. Finally, we outline a plan that actually will provide cheap, clean energy in abundance.

If we must oppose Putin’s expansionism, it is vastly better to do so with cheap energy than with other methods.



Section I: Russian Energy – Strength Or Weakness?

Russia is a global energy giant, both in terms of production and trade. It was the world's third-largest producer of petroleum and other liquids in 2021 (after the United States and Saudi Arabia), producing an average of 10.5 million barrels per day (b/d) in total liquid fuels production, which amounts to 14 percent of the world's total supply. It was the second-largest producer of dry natural gas (after the United States), producing 762 billion cubic meters (bcm) of natural gas.¹⁰

The exports of these products are hugely – indeed, disproportionately – important to the Russian economy. Revenues from oil and natural gas made up 45 percent of Russia's federal budget in 2021.¹¹ The same year, Russia's exports of goods and services amounted to \$540 billion (about 35 percent of Gross Domestic Product, GDP) but exports of crude oil, petroleum products, and natural gas accounted for 45 percent of that, or \$243 billion (See Figure 1).¹² Russia has been well described as "a rentier state dependent on hydrocarbon

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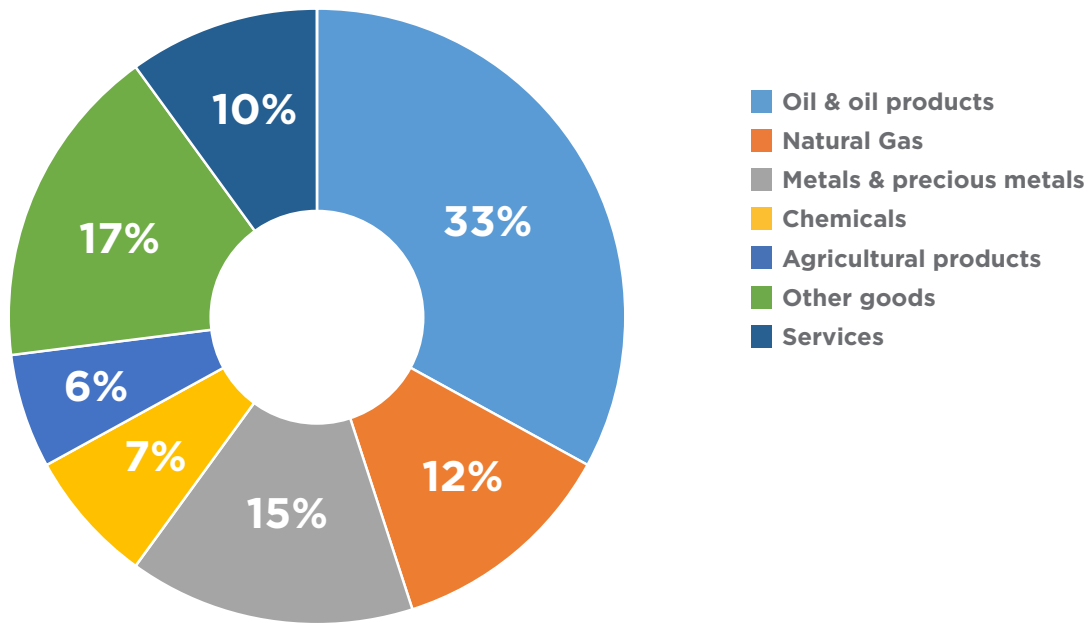
production.”¹³

Exports are the price a country pays for its imports. This is especially true when the goods and services imported by a country are invoiced in another country's currency. This is the situation faced by Russia. The U.S. dollar was the invoicing currency for 36 percent of Russian import transactions in January to September 2021 and the euro accounted for another 31 percent.¹⁴ Russian importers need dollars and euros to pay for these imports. Nobody in Russia can print these dollars or euros so they need either to borrow them – and Russia's 1998 foreign debt crisis illustrates the perils of that strategy¹⁵ – or earn them through trade. In short, leaving aside borrowing, if Russia wants to buy a good or service which is priced in dollars it must first sell something for dollars to get the currency necessary to fund the purchase.

That 'something' is oil and natural gas. Russia runs a current account surplus – meaning that it exports more goods and services than

FIGURE 1

Product Structure Of Russian Goods Exports In 2021



Source: Bank of Finland

it imports – but this is reliant on exports of energy. Remember that in 2021 Russia’s exports of goods and services amounted to \$540 billion, \$243 billion of which came from exports of crude oil, petroleum products, and natural gas, so that its non-energy exports came to \$297 billion. The same year, Russia’s imports came to \$380 billion. Put simply, without the foreign currency that Russia earns from its exports of energy, it would not be able to fund its imports. If the value of Russia’s energy exports fell by 30 percent, its current account would be plunged into a deficit (See Figure 2). Some 55 percent of Russia’s exports are invoiced in U.S. dollars, mostly

“If the value of Russia’s energy exports fell by 30 percent, its current account would be plunged into a deficit.”

because energy is typically priced in them (the euro accounts for another 29 percent of Russian export invoicing).¹⁶

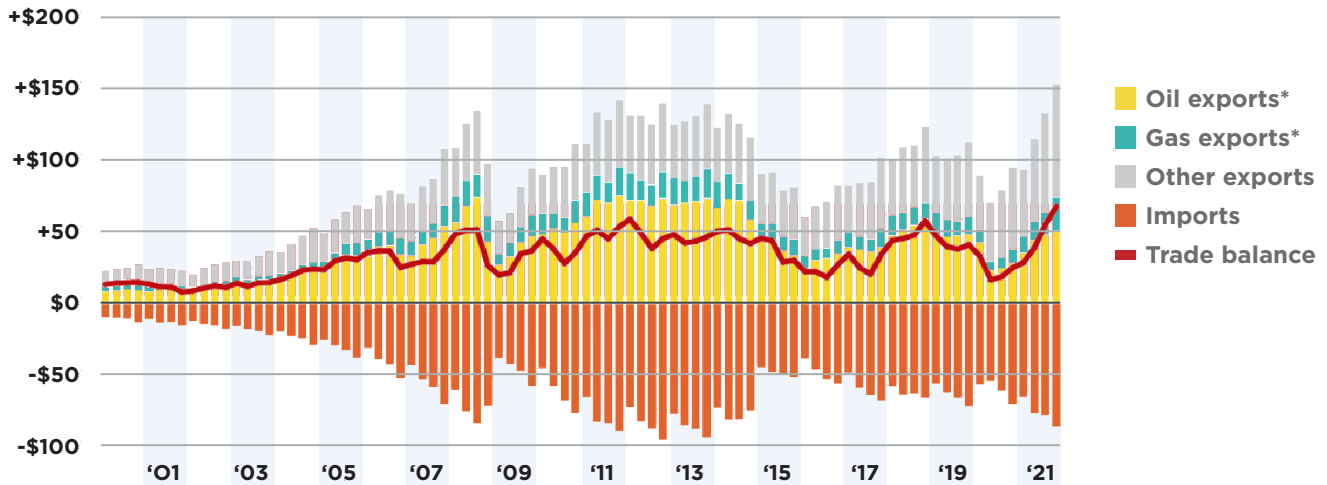
The imports Russia pays for with its exports of oil and natural gas are crucial to some of its most important industrial sectors. In 2021, machinery, equipment, and vehicles accounted for 40 percent of total Russian imports (which came to \$380 billion, about 25 percent of GDP), with chemicals and food also making up a significant share of imports (See Figure 3). In certain key

manufacturing sectors, imports represented between 55 and 75 percent of the value added in the sector’s final demand in 2018. The share

FIGURE 2

Russia's International Trade In Goods, Billion

Russia's international trade in goods since Q1 2000



* Oil exports incl. crude oil and oil products; gas exports incl. natural gas and liquefied natural gas

Source: Bank of Russia

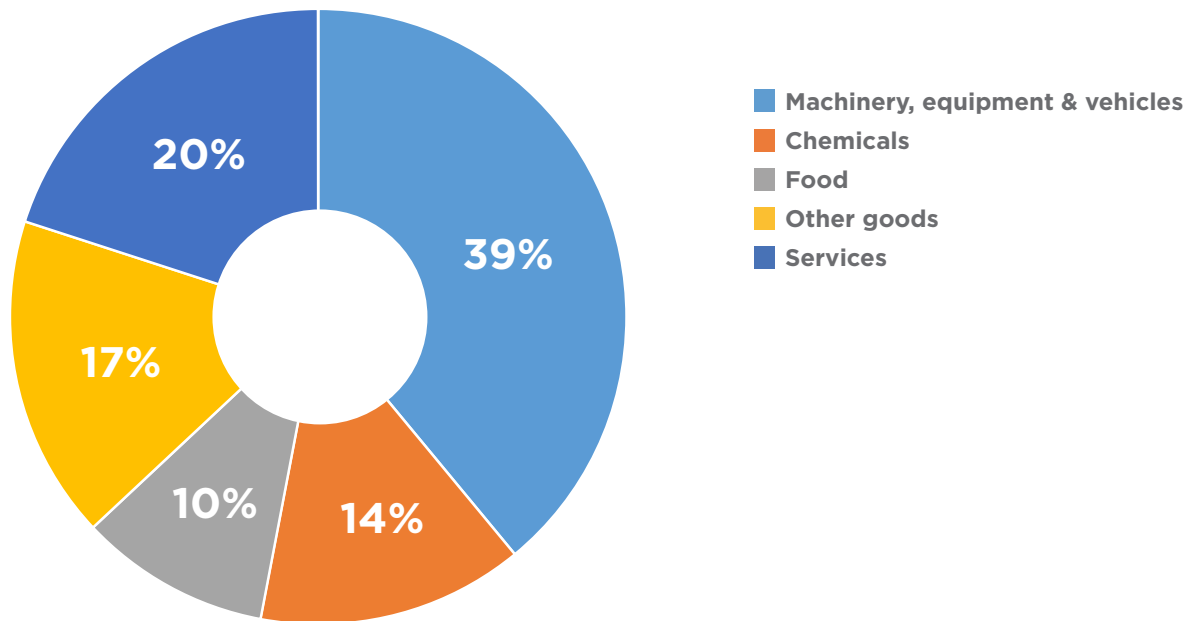
of imports was highest in sectors of machinery & equipment and computers & electronics. In the food sector, the share of imports was 20 percent.¹⁷

To see how important these imports are, consider the Kopeysk Machine-Building Plant, which holds the Russian state monopoly on mining machines for potassium and coal mines. It produces these using a machine – the Mori Seiki VL-553 II – which is made by a German branch of a Japanese company. The CEO of a manufacturer of machines for military plants says that Russia doesn't produce bearings, ball screws, drives, CNC systems, or spindles, instead she has to import it all, even though, as a military supplier she isn't supposed to.¹⁸ In March, it was reported that Russia's largest tank manufacturer,

Uralvagonzavod, had halted production of T-72B3 tanks because of a lack of component parts supplied from foreign countries.¹⁹

The Russian government is aware of this vulnerability. The Central Bank of Russia (CBR) has been accumulating a reserve of dollars, reaching a record high of \$638.2 billion on January 14. And, unlike most central banks, since 2018 the CBR has held relatively little of its reserves in US Treasury securities at the Federal Reserve Bank of New York.²⁰ But this is a finite source of funding for future imports. Once it is depleted, Russia will have to either cut back on its imports or find a source of new foreign currency. If global energy prices were significantly lower, Russian energy exports would be much less likely to plug this gap.

FIGURE 3
Product Structure Of Russia's Imports In 2021



Source: Bank of Finland



Section II: Why Renewables Are Not The Answer

Skyrocketing energy prices in Europe and the Russian invasion of Ukraine have prompted some leaders in Europe and the United States to call for a redoubling of their commitments to so-called “green” energy sources like wind turbines and solar panels to bolster energy security. Unfortunately, wind and solar are utterly incapable of delivering on this desired outcome, which means building more wind turbines and solar panels would simply double down on the failed policies that allowed Russia to leverage its energy sector for geopolitical gain in the first place.

Wind and solar are incapable of materially increasing energy security because they are unreliable, weather-dependent technologies that are primarily manufactured abroad using metals and minerals mined and refined in foreign countries.

Secondly, 80 percent of solar panels and many of the components used in wind turbines are produced in China. Furthermore, these

technologies are material intensive, requiring vast quantities of copper, nickel, cobalt, lithium, and rare earth metals. According to an analysis from the International Energy Agency (IEA), many of these metals are mined in foreign countries and refined in China.

These factors mean claims that building wind and solar will increase global energy security are unmoored from reality.

Unreliable Energy Breeds Dependency on Russia

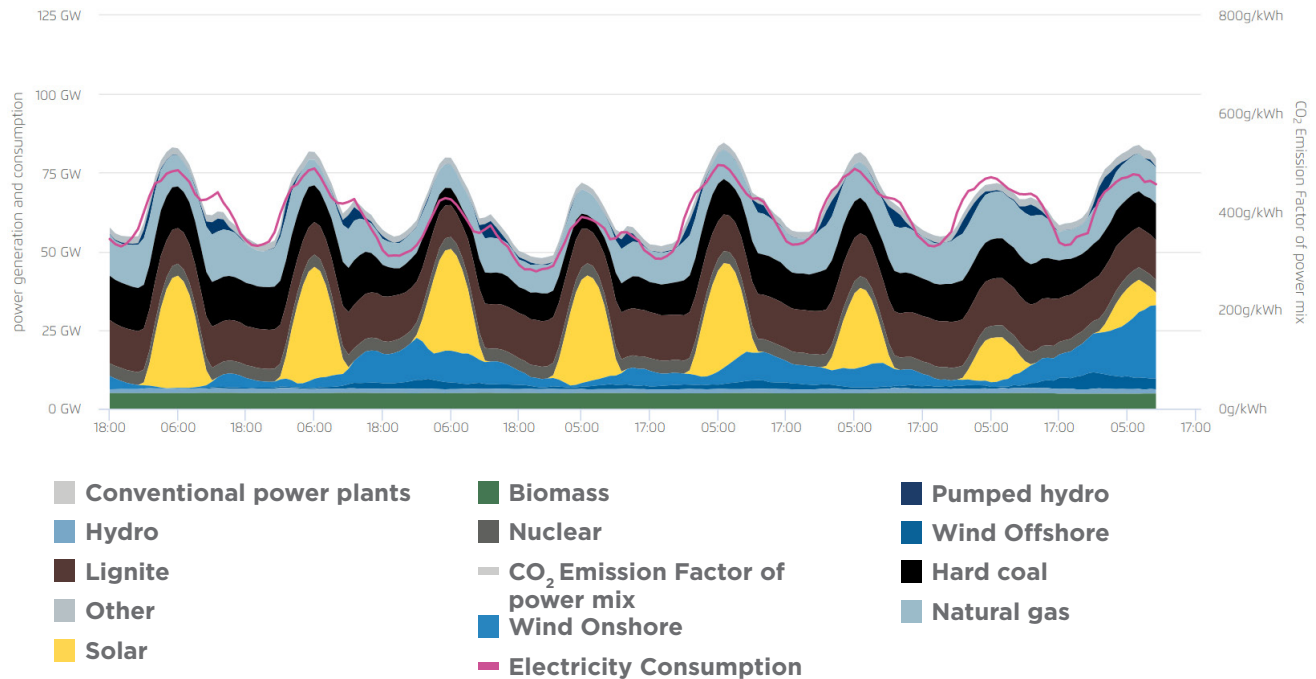
Wind and solar are unreliable sources of energy because they only generate electricity if the wind is blowing or the sun is shining. This means nations that invest in these technologies still need natural gas to

generate electricity when the weather isn't cooperating. In Europe, where several nations have banned hydraulic fracturing for both oil and natural gas production, this energy comes from Norway, and the Russians.

“Building more wind turbines and solar panels would simply double down on the failed policies that allowed Russia to leverage its energy sector for geopolitical gain in the first place.”

FIGURE 4

German Hourly Electricity Generation By Source



Source: Agora-Energiewende

German energy policy has prioritized wind and solar development while at the same time phasing out nuclear power plants and coal-fired power plants. Germany has also constructed the Nord Stream pipeline systems capable of importing Russian natural gas through the Baltic Sea. As a result, Germany is reliant upon Russia for 55 percent of its natural gas use, 52 percent of its coal, and 34 percent of oil used in the country.

Therefore, Germany is a textbook example of how heavy investment in wind and solar technologies have *increased* the nation's dependence on Russian energy, rather than diminished it.

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Building wind turbines and solar panels has allowed Germany to use less energy from fossil fuel and nuclear power than before these energy facilities were constructed, while simultaneously making Germany more reliant upon natural gas at crucial times to maintain electricity generation when the weather isn't cooperating.

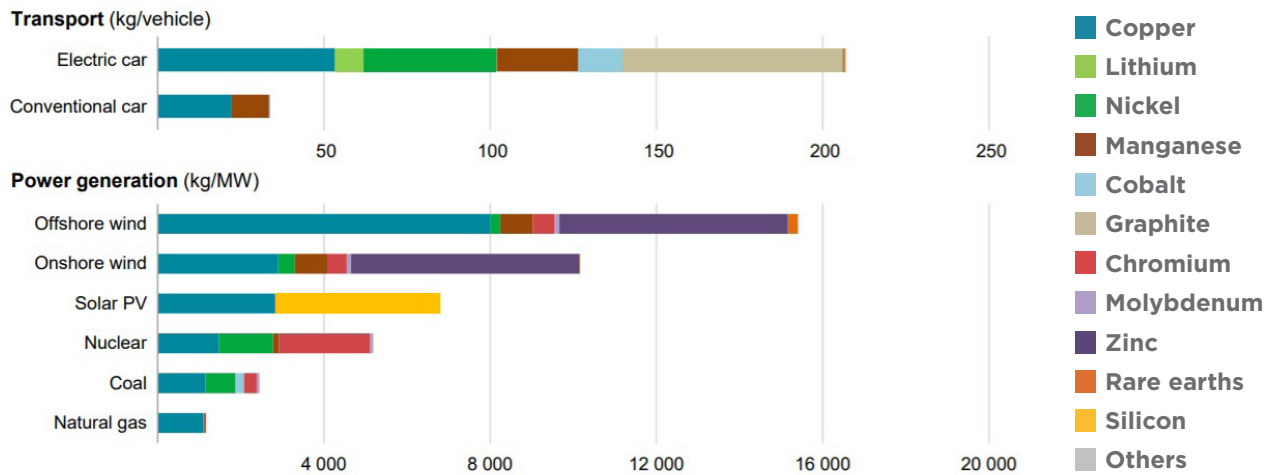
Figure 4 shows electricity demand and generation by type in Germany from March 24, 2022, through March 31, 2022. Natural gas generation increases as

wind and solar ebb and flow on the grid.²¹

Germany is so dependent upon Russian oil and gas that the country's economic and energy

FIGURE 5

Minerals Used In Selected Clean Energy Technologies



Notes: kg = kilogramme; MW = megawatt. Steel and aluminium not included.

Source: IEA

minister, Robert Habeck, warned that an immediate boycott of Russian energy could hurt the German population more than Vladimir Putin, bringing mass unemployment and poverty.²²

The Green party politician predicted “mass unemployment, poverty, people who can’t heat their homes, people who run out of petrol” if his country stopped using Russian oil and gas. “If we flip a switch immediately, there will be supply shortages, even supply stops in Germany,” said Habeck.

Mining, Refining, and Manufacturing

If installing more wind turbines and solar panels is meant to increase energy security, doing so will have the opposite effect. According to the International Energy Agency (IEA),

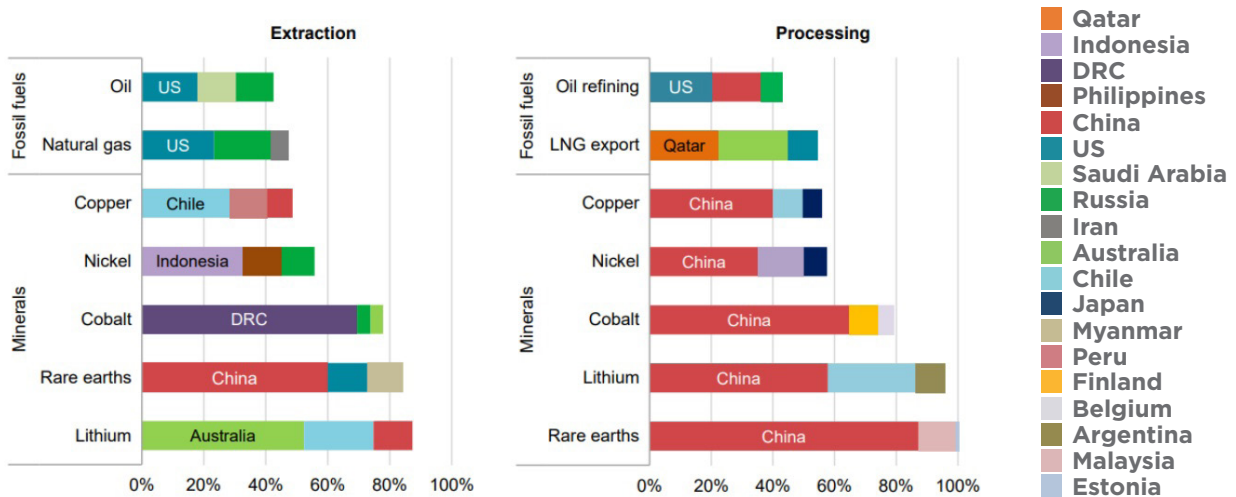
so-called “green” energy technologies, such as electric vehicles, wind turbines, and solar panels, use much more copper, nickel, lithium, cobalt, and silicon than the energy sources they hope to replace (See Figure 5).

These metals are not, as a rule, mined or refined in the European nations that serve as a primary destination for Russian energy. Figure 6 from IEA shows the top three global producers of selected energy commodities.

The top copper producers are Chile, Peru, and China. Nickel production is topped by Indonesia, the Philippines and Russia. Cobalt is primarily produced in the Democratic Republic of the Congo (DRC) with contributions from Russia and Australia. Rare earths are extracted predominantly in China, with the United States and Myanmar also producing appreciable quantities. Global lithium production is

FIGURE 6

Share Of Top Three Producing Countries In Production Of Selected Minerals And Fossil Fuels, 2019



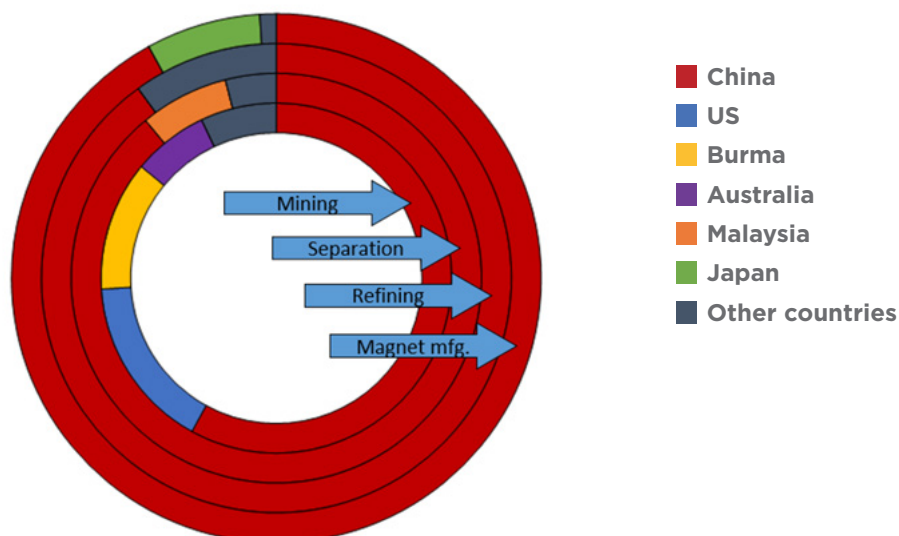
Notes: LNG = liquefied natural gas; US = United States. The values for copper processing are for refining operations.

Source: IEA (2020); USGS (2021), World Bureau of Metal Statistics (2020); Adamas Intelligence (2020).

FIGURE 7

Geographical Concentration Of Supply Chain Stages For Sintered NdFeB Magnets

From center: rare earth mining, oxide separation, metal refining, and magnet manufacturing



concentrated in Australia, Chile, and China. According to the United State Geological Survey (USGS), China was the world's largest producer of silicon, accounting for 70 percent of global production, with Russia and Brazil being the second and third largest producers, respectively.²³

While there is a somewhat broad geographical diversity of where these metals are mined, the refining of these products is dominated by China, which was the world's largest refiner of each of these metals, according to IEA. As a result, it is no surprise that China dominates the supply of rare earth magnets used in wind

turbines (See Figure 7), and produces 80 percent of solar panels produced globally.^{24,25}

Arguments that the world should seek to use more wind turbines and solar panels to reduce reliance on Russian energy and bolster domestic energy security do not stand up to scrutiny. The unreliable nature of wind turbines and solar panels makes countries reliant upon natural gas power plants to provide electricity when the weather is not cooperative. Furthermore, the fact that most of the metals and minerals needed for "renewable" technologies are either mined or refined in foreign countries does not solve the challenge of foreign dependence for energy.



The Western world must neutralize Vladimir Putin's, and the Chinese Communist Party's use of energy as a geopolitical weapon. It must immediately act to bolster its domestic production of coal, natural gas, and oil, restart existing nuclear power facilities, and embrace a build-out of new nuclear power plants to reduce the need for imported fuels in the future.

The United States is uniquely situated to rise to this occasion because it has an abundance of fossil fuel resources that give America distinct geopolitical and economic advantages. In fact, the United States is the largest producer of oil and natural gas in the world, producing more oil than Saudi Arabia (See Figure 8) and more gas than Russia.²⁶

America also has the largest coal reserves in the world, which offer approximately 470 of years of supply at current domestic consumption rates. Increasing coal production and exports would allow the United States to undermine Russian exports to the European Union, South Korea, and Japan.^{27,28}

Rather than impeding American energy production, we should fully embrace it. This would

entail rolling back several initiatives enacted by the Biden administration that discourage domestic oil production and favor production by the Organization for Petroleum Exporting Countries (OPEC), and Russia. The U.S. should also construct new coal export terminals, allowing more American coal to reach global markets

and allow European nations to diversify their fuel supply.

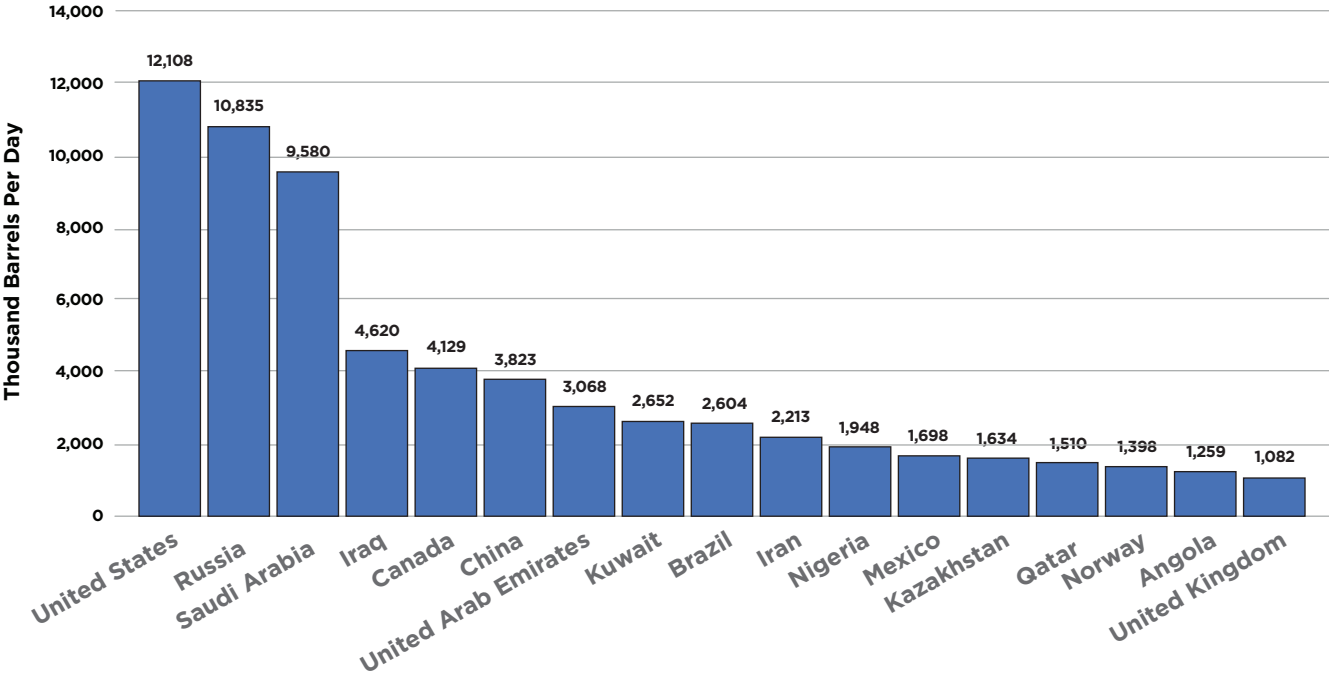
Lastly, the United States must make a concerted effort to build new nuclear power plants. Nuclear power plants are the only scalable source of electricity generation that can replace coal and natural gas,

leaving more of these essential fuels available for export. A robust domestic nuclear power industry will also allow the U.S. to export reactor designs to other countries to compete with Russian and Chinese plant designs, which will enhance American influence abroad without the need for military deployment.²⁹

Embracing American energy production and export will enhance economic opportunities in the United States, provide our allies with the energy they need, and undermine a key revenue stream for both the Kremlin and Beijing.

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FIGURE 8
Global Crude Oil Production By Country, 2022



Data Source: World Population Review



In the 1960s, vast oil deposits were discovered in western Siberia. As global oil markets were disrupted in the 1970s, the Soviet Union saw its oil exports increase rapidly: oil exports to OECD countries grew from just over \$2 billion in 1972 to \$25 billion in 1980. Oil and gas rose from 16 percent of total Soviet exports to 52 percent in 1982. Flush with this revenue, the U.S.S.R. gave up trying to develop or diversify its economy and embraced its status as a petro-state. By the 1980s, the Soviet Union was the world's largest producer of oil and gas.

These hydrocarbon export revenues enabled the Soviet Union to adopt a more aggressive foreign policy. During the 1970s, the U.S.S.R. built a blue-water navy, achieved numerical superiority over the United States in strategic nuclear weapons systems, and launched military interventions in Africa and Afghanistan. Soviet military spending rose from an already high 13 percent of GDP in 1970 to 16 percent in 1980, financed by hydrocarbon export revenues.

In 1986, Saudi Arabia dramatically increased

oil production and oil prices plunged by 70 percent. The Soviet Union's total annual oil and gas revenues collapsed from over \$260 billion in 1982 to just \$75 billion in 1986. The underlying weakness of the Soviet economy was exposed. Economic reforms were quickly followed by political reforms. In 1991, the U.S.S.R. ceased to exist. The Cold War was over.³⁰

The role of Saudi Arabia and its oil industry in the collapse of the Soviet Union and the peaceful ending of the Cold War is a seldom commented on but important factor. Vladimir Putin's Russia is no less dependent on the production and export of oil and natural gas today as

was the Soviet Union inherited by Mikhail Gorbachev in 1985. This weakness masquerading as a strength is there to be exploited now, as it was then. And, as then, it offers an important tool in resolving international conflicts without resort to military means. Maximizing the energy resources of the United States to the fullest will yield significant economic benefits, but its greatest legacy could be a more peaceful future.

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