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2022



# Tomorrow's Energy Security Exposes Today's Risks

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“Energy security” is not a new mantra. Governments around the globe have recognized the need to ensure sufficient, dependable energy resources to drive their economies. Subsumed sometimes within energy security is the goal to become energy independent. These goals moved to the forefront on February 24, the date of Russia’s invasion of Ukraine. The ensuing war raised the specter of a world that had become dependent on Russian oil and natural gas, particularly Europe. Energy security, at least in the short term, does not always mean eschewing imported energy, but it does mean identifying stable sources of energy, be it oil, natural gas, and the like.

## Fossil Fuels and Climate

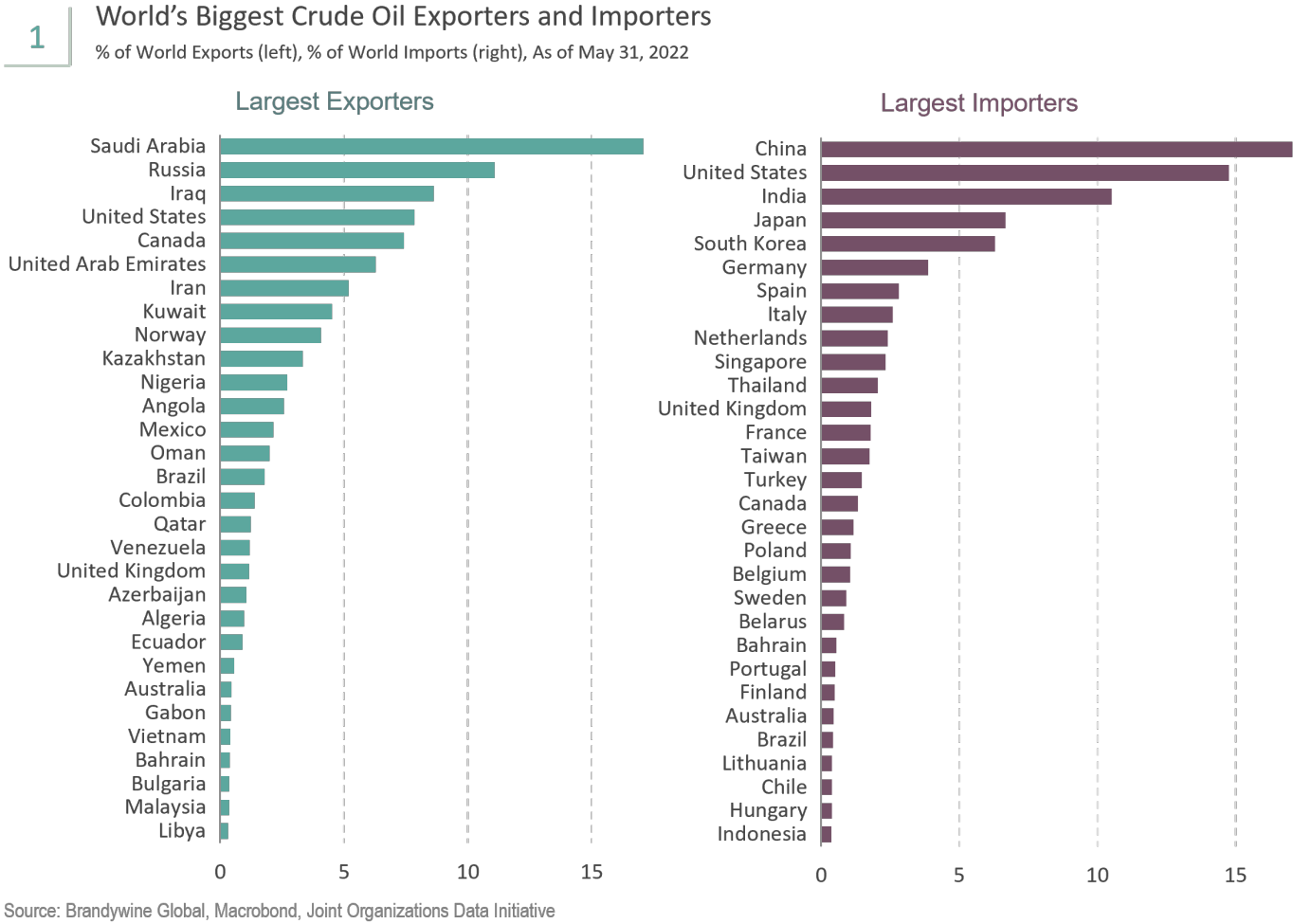
When addressing energy security, reduced usage of fossil fuels and the implementation of climate change policies are integral parts of the energy equation. The Paris Climate Agreement includes 192 countries plus the European Union. Those entities have committed to reduce emissions and mitigate the effects of climate change. Yet, progress has fallen short of goals. Over time, countries want to reduce emissions and shift toward more renewable sources of energy. However, in this quest, there is a recognition that energy can be used as a weapon by bad actors. Vladimir Putin certainly recognizes the power he can wield via energy. Now, the world knows it can no longer depend on countries that weaponize critical exports.

Emissions reduction, based on Paris Agreement commitments, has been front and center for many countries. Furthermore, Putin’s War may have accelerated countries’ efforts regarding their emissions reduction programs and drive toward energy security and away from fossil fuel dependency. However, there is little a country can do short term. Oil prices have skyrocketed, creating the highest global inflation seen in decades in some countries. Oil markets began anticipating Russia’s intentions in early December 2021 as Cushing crude spot prices (WTI) bottomed at around \$66 per barrel. In the weeks following the invasion, prices spiked to almost \$124 per barrel. Geopolitics have always been a driving factor of oil prices, and oil shocks are not new for the global economy, going back to the Suez Crisis of 1956-57. However, these shocks seem to keep occurring, and countries are ill prepared. It could be different this time.

## How We Got Here

Let us look at the exporters and importers of both oil and natural gas to identify some of the potential winners and losers. Immediately after the invasion, the U.S. and European countries levied onerous economic sanctions, which would have an impact on the ebb and flow of oil. Some outcomes were easily predictable: prices would rise, supply would become constrained, and economic activity would be impacted. However, the war aggravated forces already affecting global economic activity: the pandemic-related supply and demand imbalances, a lack of supply-increasing energy investment by the oil industry, and the movement away from fossil fuels, in line with Paris Agreement commitments. A frictional-less substitution away from fossil fuels short term, importing oil and natural gas to smooth the transition and ensure consistent energy, sometimes means giving bad actors economic leverage.

**Figure 1** depicts the largest crude oil exporters and importers. The U.S. stands out as both a large exporter and a large importer, although it should be noted that the U.S. imports crude that it refines into gasoline and heating oil, for example. The world’s largest exporters are Saudi Arabia and Russia, while the biggest importers are China, the U.S., and India. However, the U.S. has benefited from its shale revolution, moving along the road to energy security. On the export side of the ledger, a number of unstable producers stand out, with supply flowing from regions of geopolitical risk, at least in the short run. Venezuela is an example. Based on Brandywine Global’s assessment of energy security, we find many exporting countries exhibit high energy security currently, including the U.S., Canada, Nigeria, and Russia, to name a few. On the other hand, the importers face a higher energy security risk, including several European countries and China.



**Figure 2** covers natural gas exporters and importers. The U.S. and Russia top the natural gas exporter list. Germany, China, and Japan are the largest importers of natural gas. However, the natural gas exporters, excepting Russia, tend to be more democratic countries, with more stable governments and, hence, greater supplier reliability. Yet, the risk in the current environment emanates from a dependency on a particular supplier of natural gas, here Russia, and particular geographies. What countries depend on Russia for its supply of oil and gas?

## World's Biggest Natural Gas Exporters and Importers

% of World Exports (left), % of World Imports (right), As of May 31, 2022



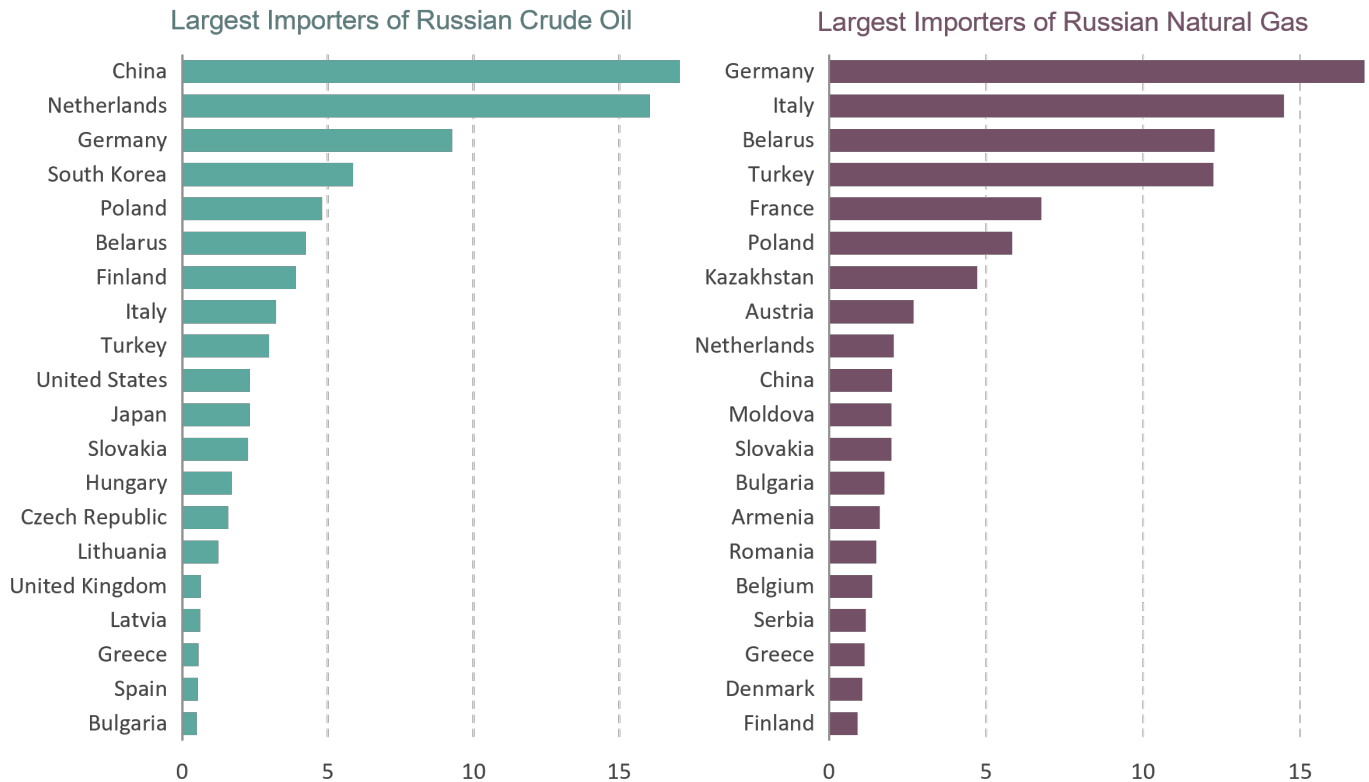
Source: Brandywine Global, Macrobond, Joint Organizations Data Initiative

**Figure 3** helps answer the question posed above. China is, far and away, the largest importer of Russian crude oil, which explains the “special relationship” between Russia and China, a bond rooted both in economic necessity and a collaborative effort to challenge the U.S.’s global influence. After China, the Netherlands, Germany, and Poland are among Russia’s biggest oil customers. For natural gas, Germany, Italy, and France are top importers of Russian supply. That dependency on Russia has put Europe in an economic bind, subjecting its countries to high, rising inflation and sending these countries scrambling to untether themselves from Russian gas and find other supply sources.

For some time, Europe was able to source natural gas from North Sea gas fields to meet demand. Over time though, North Sea natural gas production deteriorated, leading a number of European countries to look for other supplies. Proximity to Russia provided an answer. The hope among European leaders was that increasing their energy relationship with Russia would not only solve a supply issue, but also might integrate Russia into the global economy. Their thinking was that a westward-looking Putin, concerned with growing the Russian economy, might help dampen prospective geopolitical tensions in the region. That assessment proved wrong with Crimea in 2014. The 2022 invasion of Ukraine certainly clarified Putin’s intentions.

## Russia's Biggest Crude Oil and Natural Gas Importers

% of Crude Oil (left), Natural Gas (right), As of December 31, 2021



Source: Brandywine Global, Macrobond, Federal Customs Service of Russia

## Reacting to the Crisis

Europe has been significantly impacted by the sanctions on Russia, and the region is determined to cease importing oil and gas from Russia by 2030. Europe's "partnership" with Russia has been an economic and security disaster, with countries like Germany especially hard hit. Against the backdrop of reduced Russian dependency, Europe—and much of the world—also will be planning to become a net zero economy. However, reducing usage of fossil fuel and meeting climate goals might be incompatible over the next several years. Take Germany, for example. Germany must replace the oil and gas it gets from Russia. Liquefied natural gas (LNG) from the U.S. is an option, but it comes at a higher cost since new terminals still must be built. Germany could ramp up coal usage from its own reserves. The country, briefly, explored turning back on shuttered nuclear reactors, but policymakers concluded it was a costly undertaking and would not materially affect energy needs. Furthermore, German policymakers believed that returning to nuclear power could jeopardize the country's goal of 100% renewable energy by 2035.

Overall, the European Union (EU) intends to totally reduce its energy imports from Russia over a 5-year period. The European Commission (EC) wants to spend \$220 billion dollars on implementing its energy plan, known as REPowerEU. The plan calls for investments in natural gas and LNG and support for eastern European countries without access to non-Russian oil. Funds will be directed to renewable energy, building a hydrogen infrastructure, and heat pumps for consumers. Other countries plan to increase their exposure to nuclear power since the EC rolled back its previous opposition to nuclear and now categorizes it as a sustainable investment, a position that has been roundly criticized.

France already derives over 70% of its electricity from nuclear and, according to President Emmanuel Macron, nuclear will remain a critical part of its energy mix. Nuclear power has allowed France to move further along the

path of energy security. The country is considering building as many as 14 new nuclear reactors, with 6 reactors planned for certain and 8 more under study. However, large-scale nuclear plants are expensive to build; in the U.S., they take on average seven years to build. Furthermore, they are subject to significant cost overruns, concerns over safety, and questions around sourcing fuel and disposing of waste. Sourcing uranium presents geopolitical risks, too, as Kazakhstan, Niger, and Russia are large suppliers. However, stabler sources of uranium are also available from Canada and Australia. These concerns are balanced against the advantages of emissions-free electricity and greater energy security.

Hungary and Poland are two countries pursuing the nuclear path now that the EU counts nuclear energy as “green” investment. Two important Asian economies, both under new leadership, also are inching closer to nuclear programs: Japan and South Korea. Currently, both countries depend largely on coal and oil to generate electricity. Now, their new leaders have done a philosophical about-face on including nuclear power in their energy generation mix, as prices for natural gas make nuclear a more economical solution to decarbonize and improve energy security. Both countries recognize that using natural gas as the transition fuel just got very expensive—too expensive. As with European and U.S. nuclear projects, cost overruns and safety issues remain. One possible solution to these concerns could be the implementation of new nuclear technology, such as small modular reactors (SMRs). Construction time is faster, and the reactors are built in a factory rather than on site. SMRs are not widely utilized yet, but their development continues, and implementation should not be far behind.

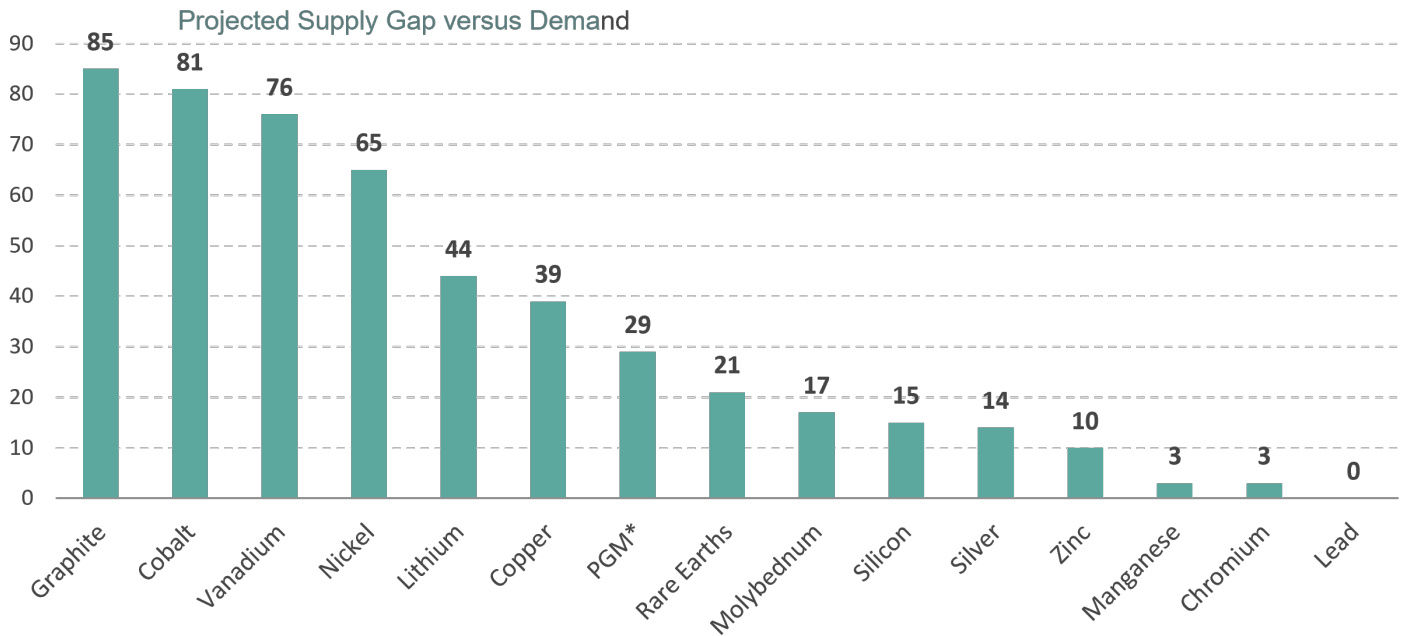
## Doing the Same Thing at the Same Time

The Russia-Ukraine War and the dependency on fossil fuels might push countries on the path to decarbonization perhaps a bit quicker than initially planned. That will mean countries around the world, especially those dependent on Russia for fuels, will accelerate the shift to renewable sources of energy. Countries understand the need for making the switch into renewables as integral to energy security. However, the move into renewables has its own sources of risk.

Imagine all countries trying to squeeze through the renewables door at the same time. Everyone could not get in. By extension, suppose many countries wanted to make a concerted push to reduce exposure to fossil fuels and shift electricity generation to renewables. This shift puts cost pressure on the materials needed to implement such a strategy. The chart below, from ASR, shows that a supply imbalance in essential commodities needed for renewable investment (see [Figure 4](#)) exists, which will pressure costs. Eventually, producers will boost supplies of commodities like copper and cobalt. In the meantime, increasing investment in renewables will generate inflation, or “greenflation.” A lot of money will be chasing these metals. Trillions of dollars in green investment annually will occur as the world attempts to reduce its carbon footprint.

## Metal Supply Is Unlikely to Keep Up with Demand

%, 2021-2050



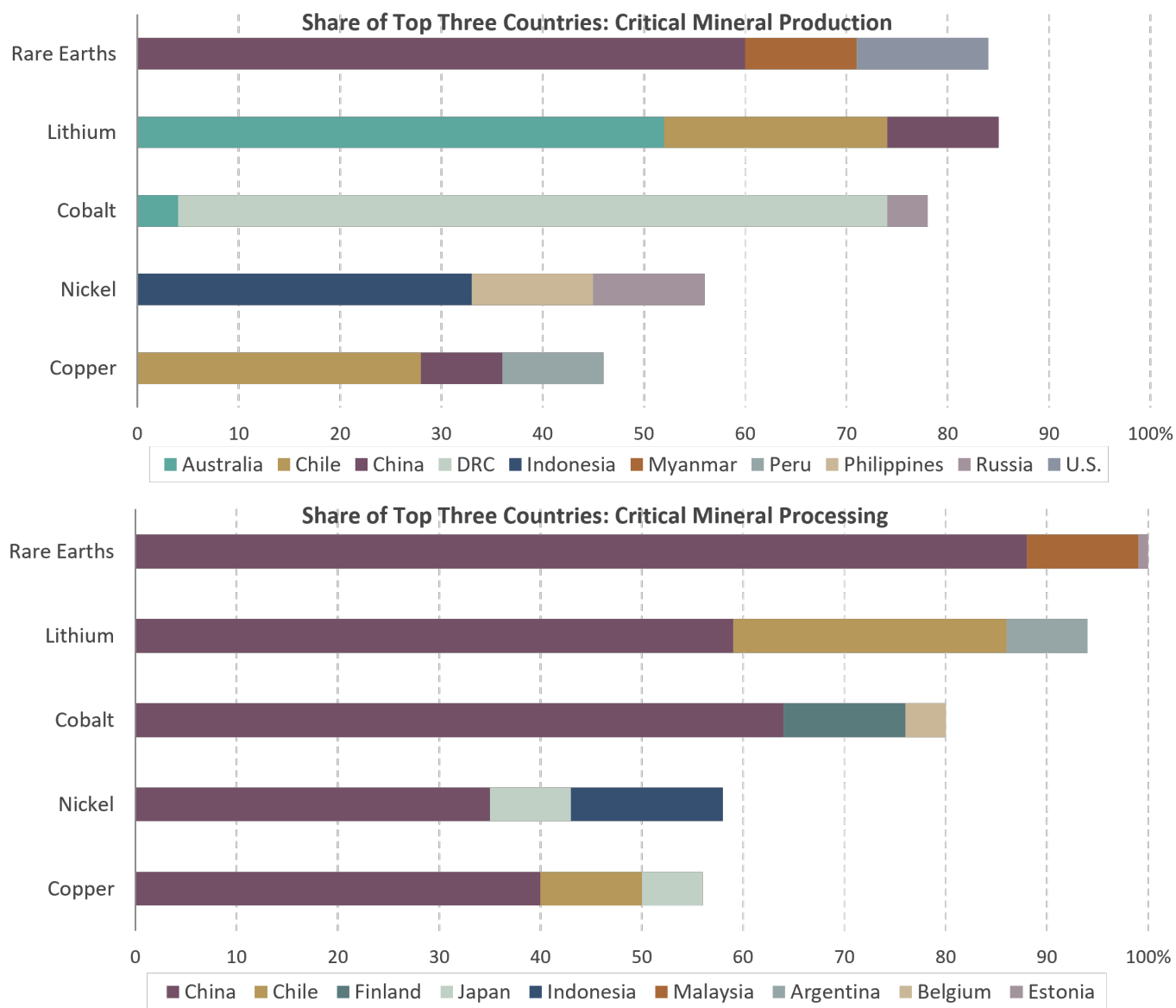
Source: ASR Ltd, IMF

\*Platinum Group Metals

A second thornier issue is akin to what is going on with oil and gas prices right now, illustrated in the previous tables. Energy exporters can sometimes be countries with which it is risky to trade. The mining and processing of necessary metals are concentrated in riskier parts of the world. Some of those countries are run by autocrats or are unstable regimes. The EU recognized the sourcing risk of critical metals and created a plan that attempts to address the procurement and processing of these metals. The EU wants to avoid creating another Russia-like dependency on countries that mine and process these critical metals. [Figure 5](#) shows the country concentration of producers and processors of critical materials.

## Top Critical Mining Producers and Processors

% Share Production (top), Processing (bottom), As of May 2022



Source: IEA, Verisk Maplecroft

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China, for example, represents an extreme concentration for these metals. It is a sizeable producer (60%) and processor (80%) of rare earths. Rare earth metals are used to make magnets and to produce lithium batteries, among many other uses. Cobalt is used in rechargeable batteries but is mined in the Democratic Republic of the Congo (DRC), where political instability and corruption could be risks. Russia is also a key source for nickel and cobalt. Many democratic countries will be looking for alternatives instead of relying on these regimes and risking a repeat of the Russia mistake when it comes to commodities critical to developing renewable energy sources. Countries will be looking to deal more with stable governments in sourcing these materials. The EU's plan includes increasing domestic production and processing. Historically, cost and regulations, including environmental concerns over domestic mining, have pushed production and processing into emerging economies. However, increased geopolitical tensions and the recent unreliability of supply chains are leading to changes in the approach any country will take to become energy secure. The problems, of course, are commitment and time.

# Conclusions

- The confluence of forces—the war in Ukraine, supply constraints, and the decarbonization movement—will drive countries toward real energy security.
- Short term there is no silver bullet to relieve the energy-driven pressures on the global economy.
- The beneficiaries of the current crisis will be the energy secure countries, some of which appear to be “bad actors” and potentially unreliable suppliers.
- In the pursuit of renewable energy production, the winners and losers in energy security could be redefined.
- Countries that are heavily dependent on energy exports and inclined to weaponize these critical resources, like Russia, face potentially severe economic impacts as countries look to reduce risk by adjusting trade relationships with such countries.
- Current events promise to push the world away from fossil fuels and toward renewables, but this shift raises the prospects of “greenflation.” Even the quest toward renewables is not without risks as reliable sources of critical materials will have to be found.

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