TESTIMONY OF

DANIEL R SIMMONS

PRINCIPAL, SIMMONS ENERGY AND ENVIRONMENTAL STRATEGIES

BEFORE THE

U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON ENERGY AND COMMERCE,
SUBCOMMITTEE ON ENVIRONMENT, MANUFACTURING, AND CRITICAL MATERIALS

HEARING: "EXPOSING THE ENVIRONMENTAL, HUMAN RIGHTS, AND NATIONAL SECURITY RISKS OF THE BIDEN ADMINISTRATION'S RUSH TO GREEN POLICIES"

INTRODUCTION

The Biden administration set aggressive net zero goals. The problem is that the net zero energy economy the Biden administration wants requires massive amounts of minerals and materials—far more than our current energy economy that is powered by oil, coal, and natural gas. An EV requires six times the mineral inputs of a conventional car for example. The International Energy Agency's "sustainable development scenario," calls for a 42-fold increase in lithium demand, a 25-fold increase in graphite demand, a 21-fold increase in cobalt demand, a 19-fold increase in nickel demand, and a 7-fold increase in rare earth demand by 2040.

While the earth certainly contains these resources, the problem is access to these critical resources. Mining and mineral processing is far more concentrated than oil production has been in at least 50 years. In fact, China is the largest processor of copper, nickel, cobalt, lithium, and rare earths—processing between 35 percent and 85 percent of these minerals. By comparison, the 13 members of OPEC – together—produce around 40% of the world's oil.

Worse, China has a terrible human rights track record. The Biden administration and other countries have sanctioned China over China's abuses against the Uyghur people for example. It's not just China,

according to experts, the Democratic Republic of Congo has more cobalt reserves than the rest of the world combined, but there are no "clean" supply chains of cobalt in the DRC. Much of the DRC's cobalt is being mined by so-called "artisanal" miners, which include children, who are paid just a few dollars a day for dangerous work.[1]

The problems with production in China and other places are not limited to modern-day slavery and human rights abuses, but also environmental degradation. The German publication Deutsche Welle argues that battery production "causes radioactive earth dumps, poisoned groundwater and Indigenous population displacement" in places like China, the DRC, and Rwanda.[2]

But there is a solution—more mineral and material production in the United States. A decade ago, many people, including President Obama, said that more oil and gas drilling in the United States was not a strategy to solve our energy challenge.[3] He was proved wrong. The vast majority of new oil production globally over the past decade came from the United States. This new oil production brought greater stability and energy security to the world. Russia's war in Ukraine, and European dependence on Russian oil and gas, highlighted the benefits of American energy self-sufficiency.

"Drill Baby Drill" worked in the United States and "Mine Baby Mine" will work as well—if people can get access to the mineral resources. Sadly, the Biden administration has worked against almost all new mines in the United States, despite the fact that these mines would produce the minerals the new energy economy requires.

---

[1] *See* e.g. Terry Gross, How 'modern-day slavery' in the Congo powers the rechargeable battery economy, NPR, Feb. 1, 2023, https://www.npr.org/sections/goatsandsoda/2023/02/01/1152893248/red-cobalt-congo-drc-mining-siddharth-kara

[2] Michel Penke, *DW.com*, The toxic damage from mining rare elements, Apr. 13, 2021, https://www.dw.com/en/toxic-and-radioactive-the-damage-from-mining-rare-elements/a-57148185#:~:text=Securing%20just%20one%20ton%20of%20rare%20earth%20elements,Research%20Division%20of%20the%20German%20think%20tank%20SWP.

[3] Obama: The American people aren't stupid, https://www.youtube.com/watch?v=wyFX2iM-dSE&

THERE ARE MASSIVE MINERAL AND MATERIAL REQUIREMENTS FOR NEW ENERGY TECHNOLOGIES

Our energy system is evolving. Regardless of government policies, better technology has driven down the cost of electric vehicles, solar panels, wind generation, and stationary battery technology. Many governments around the world have set targets for net-zero carbon dioxide emissions which rely on these technologies, including the Biden administration.

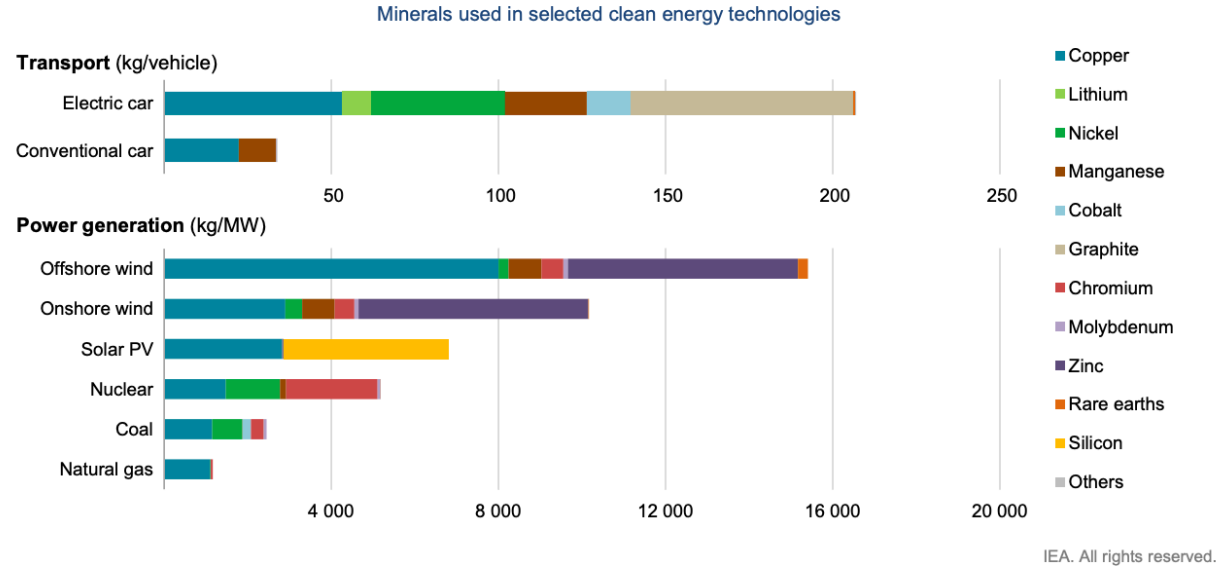
One[4] of the major impediments to net zero goals and the continued rollout of many of the energy technologies that would help reach these goals is that they require far more minerals and materials than are currently being produced. As the International Energy Agency (IEA) explains:

> An energy system powered by clean energy technologies differs profoundly from one fueled by traditional hydrocarbon resources. Solar photovoltaic (PV) plants, wind farms, and electric vehicles (EVs) generally require more minerals to build than their fossil fuel-based counterparts. A typical electric car requires six times the mineral inputs of a conventional car, and an onshore wind plant requires nine times more mineral resources than a gas-fired plant. Since 2010 the average amount of minerals needed for a new unit of power generation capacity has increased by 50% as the share of renewables in new investment has risen.[5]

[4] Note: This section is from the executive summary of the Institute for Energy Research's report, *The Economic and Strategic Importance of Domestic Mineral Production: Unlocking the Value of America's Homegrown Mineral Resources*

[5] International Energy Agency, *The Role of Critical Minerals in Clean Energy Transitions,* May 2021, https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions

The rapid deployment of clean energy technologies as part of energy transitions implies a significant increase in demand for minerals

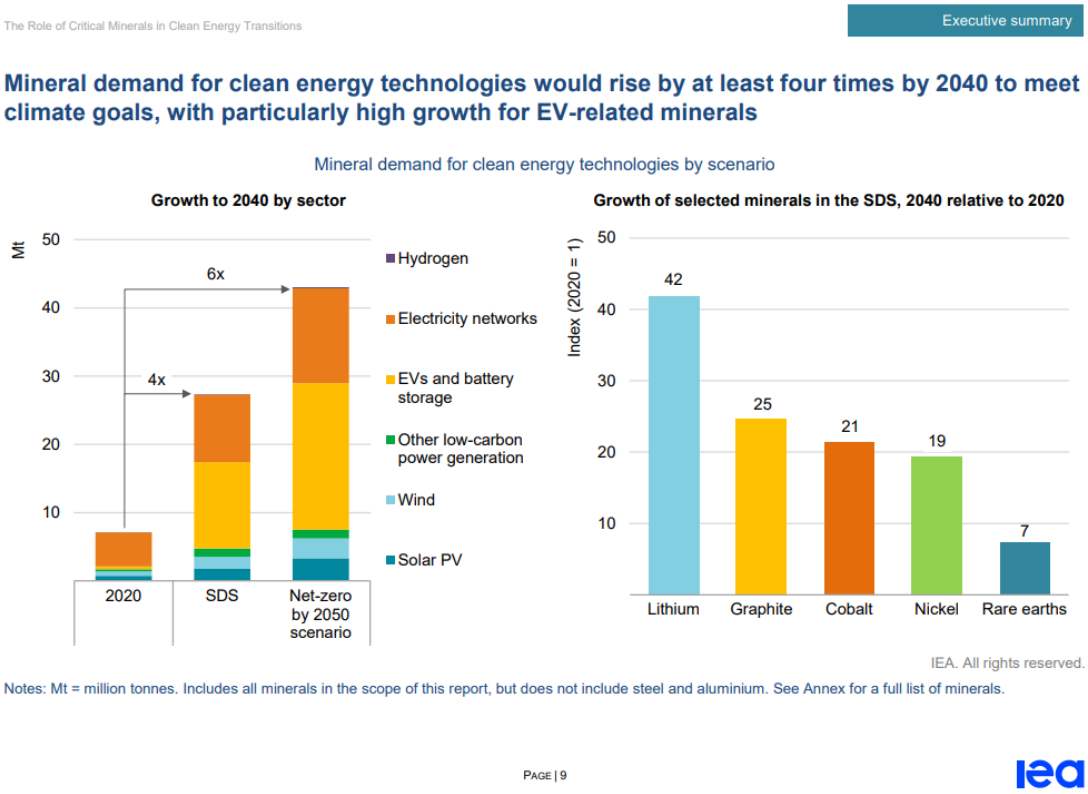


Notes: kg = kilogramme; MW = megawatt. Steel and aluminium not included. See Chapter 1 and Annex for details on the assumptions and methodologies.

Source: International Energy Agency: The Role of Critical Minerals in Clean Energy Transitions

According to the IEA's "sustainable development scenario," these new energy technologies will require a 42-fold increase in lithium demand, a 25-fold increase in graphite demand, a 21-fold increase in cobalt demand, a 19-fold increase in nickel demand, and a 7-fold increase in rare earth demand by 2040 to meet carbon dioxide emissions goals set by some governments around the world. [6]

[6] International Energy Agency, *The Role of Critical Minerals in Clean Energy Transitions,* May 2021, https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions



Source: International Energy Agency: The Role of Critical Minerals in Clean Energy Transitions

Globally, new mining projects are not projected to keep up with this incredible increase in demand. For example, EV expert Steve Levine has explained that "the EV industry is in a decades-long battery metals crisis."[7] Levine estimates, using major metals production forecasts, that by 2030 there will only be enough lithium and cobalt for 15.6 million EVs, while automakers say they want to produce over 40 million in 2030.[8] What makes this situation even more unrealistic is that demand for lithium-ion

[7] Steve LeVine, Twitter, Apr. 26, 2022, https://twitter.com/stevelevine/status/1518913709397131264?s=20&t=VDBSMrbUvCUswbzKJGU_fQ

[8] Steve LeVine, Twitter, Apr. 24, 2022, https://twitter.com/stevelevine/status/1518378692254310401. *See also* Steve LeVine, Just How Many EVs Can Be Made? Far Fewer Than Expected, *The Electric from The Information*, Apr. 24, 2022, https://subscriptions.theinformation.com/newsletters/the-electric/archive/just-how-many-evs-can-be-made-far-fewer-than-expected

batteries is not just coming from EVs, but also storage on the electrical grid made necessary by part-time renewable energy sources being mandated and subsidized into the system.

Not only are there projected shortages for minerals and materials used for EVs and batteries, but there is a massive project shortfall in necessary copper production as some of the world's largest copper mines have operated for more than a century. S&P Global recently released a report which found that "Unless massive new [copper] supply comes online in a timely way, the goal of net zero emissions by 2050 will be short-circuited and remain out of reach."[9] S&P Global projects that copper demand would have to double between now and 2035 to meet the goal of net zero by 2050. This is more than all the copper consumed in the world between 1900 and 2021.

The increase in demand for these minerals and materials is already putting upward pressure on prices. According to Benchmark Minerals Intelligence, from April 2021 to April 2022, the raw materials that constitute NCM (nickel, cobalt, magnesium) lithium-ion batteries have increased in price by 164 percent, and the raw materials that make-up lithium-ion phosphate batteries have increased by 393 percent.[10]

The problem is not just with minerals and materials shortages, but energy security as well. Russia's leverage over Europe due to its dependence on Russian oil and natural gas is a reminder of the importance of energy security and the folly of relying on untrustworthy trading partners.

The United States Geological Survey (USGS) has estimated that there were 50 minerals critical to the security of the United States. In 2021, imports comprised more than half of the U.S. consumption for 47 of these mineral commodities, and the U.S. was 100 percent net import reliant for 17 of them.

[9] S&P Global, *The Future of Copper: Will the looming supply gap short-circuit the energy transition?*, p. 9.
[10] Simon Moore's, https://twitter.com/sdmoores/status/1518680838057213952

Figure 2.—2021 U.S. Net Import Reliance[1]

Commodity	Net import reliance as a percentage of apparent consumption	Major import sources (2017–20)[2]
ARSENIC, all forms	100	China, Morocco, Belgium
ASBESTOS	100	Brazil, Russia
CESIUM	100	Germany, China
FLUORSPAR	100	Mexico, Vietnam, South Africa, Canada
GALLIUM	100	China, United Kingdom, Germany, Ukraine
GRAPHITE (NATURAL)	100	China, Mexico, Canada, India
INDIUM	100	China, Canada, Republic of Korea, France
MANGANESE	100	Gabon, South Africa, Australia, Georgia
MICA (NATURAL), sheet	100	China, Brazil, Belgium, India
NEPHELINE SYENITE	100	Canada
NIOBIUM (COLUMBIUM)	100	Brazil, Canada
RUBIDIUM	100	Germany
SCANDIUM	100	Europe, China, Japan, Russia
STRONTIUM	100	Mexico, Germany, China
TANTALUM	100	China, Germany, Australia, Indonesia
VANADIUM	100	Canada, China, Brazil, South Africa
YTTRIUM	100	China, Republic of Korea, Japan
GEMSTONES	99	India, Israel, Belgium, South Africa
TELLURIUM	>95	Canada, Germany, China, Philippines
POTASH	93	Canada, Russia, Belarus
IRON OXIDE PIGMENTS, natural and synthetic	91	China, Germany, Brazil
RARE EARTHS,[3] compounds and metals	>90	China, Estonia, Malaysia, Japan
TITANIUM, sponge	>90	Japan, Kazakhstan, Ukraine
BISMUTH	90	China, Republic of Korea, Mexico, Belgium
TITANIUM MINERAL CONCENTRATES	90	South Africa, Australia, Madagascar, Mozambique
ANTIMONY, metal and oxide	84	China, Belgium, India
STONE (DIMENSION)	84	China, Brazil, Italy, India
CHROMIUM	80	South Africa, Kazakhstan, Russia, Mexico
PEAT	80	Canada
SILVER	79	Mexico, Canada, Chile, Poland
TIN, refined	78	Indonesia, Peru, Malaysia, Bolivia
COBALT	76	Norway, Canada, Japan, Finland
DIAMOND (INDUSTRIAL), stones	76	South Africa, India, Congo (Kinshasa), Botswana
ZINC, refined	76	Canada, Mexico, Peru, Spain
ABRASIVES, crude fused aluminum oxide	>75	China, France, Bahrain, Russia
BARITE	>75	China, India, Morocco, Mexico
BAUXITE	>75	Jamaica, Brazil, Guyana, Australia
SELENIUM	>75	Philippines, China, Mexico, Germany
RHENIUM	72	Chile, Canada, Kazakhstan, Japan
PLATINUM	70	South Africa, Germany, Switzerland, Italy
ALUMINA	58	Brazil, Australia, Jamaica, Canada
GARNET (INDUSTRIAL)	56	South Africa, China, India, Australia
MAGNESIUM COMPOUNDS	55	China, Brazil, Israel, Canada
ABRASIVES, crude silicon carbide	>50	China, Netherlands, South Africa
GERMANIUM	>50	China, Belgium, Germany, Russia
IODINE	>50	Chile, Japan
TUNGSTEN	>50	China, Bolivia, Germany, Canada
CADMIUM	<50	Australia, China, Germany, Peru
MAGNESIUM METAL	<50	Canada, Israel, Mexico
NICKEL	48	Canada, Norway, Finland, Australia
COPPER, refined	45	Chile, Canada, Mexico
ALUMINUM	44	Canada, United Arab Emirates, Russia, China
DIAMOND (INDUSTRIAL), bort, grit, dust, and powder	41	China, Ireland, Republic of Korea, Russia
LEAD, refined	38	Canada, Mexico, Republic of Korea, India
PALLADIUM	37	Russia, South Africa, Germany
FELDSPAR	32	Turkey
SILICON, metal and ferrosilicon	32	Russia, Brazil, Canada, Norway
SALT	29	Chile, Canada, Mexico, Egypt
MICA (NATURAL), scrap and flake	28	Canada, China, India
LITHIUM	>25	Argentina, Chile, China, Russia
BROMINE	<25	Israel, Jordan, China
ZIRCONIUM, ores and concentrates	<25	South Africa, Senegal, Australia, Russia
PERLITE	23	Greece, China, Mexico, Turkey
VERMICULITE	20	South Africa, Brazil

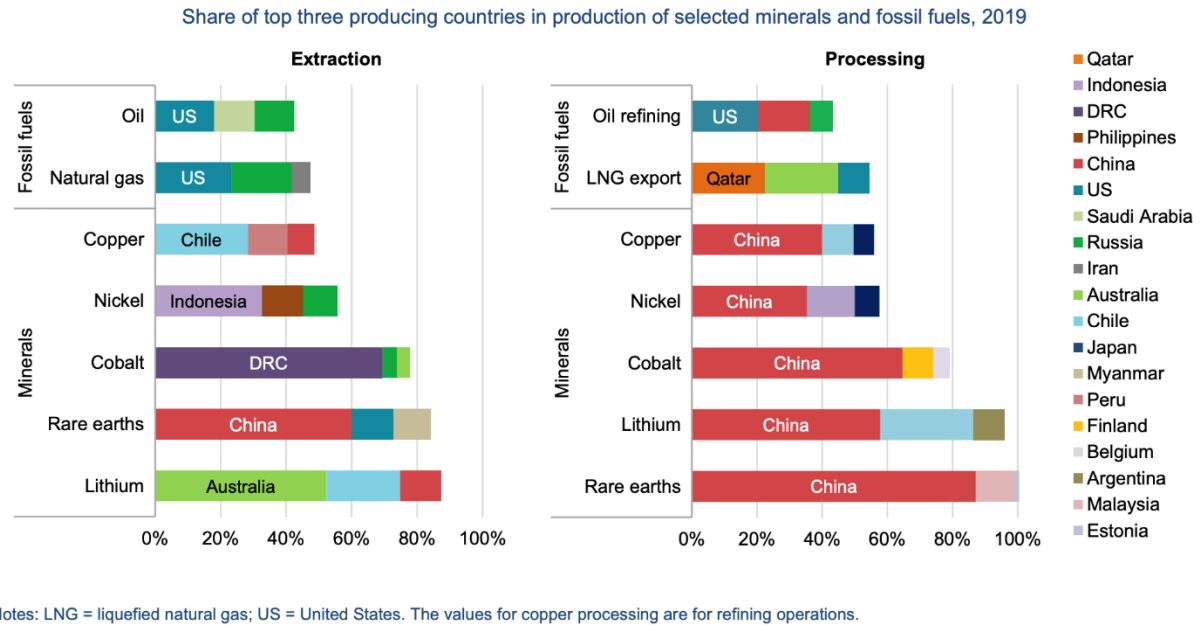
[1]Not all mineral commodities covered in this publication are listed here. Those not shown include mineral commodities for which the United States is a net exporter (boron; clays; diatomite; gold; helium; iron and steel scrap; iron ore; kyanite; molybdenum; rare earths, mineral concentrates; sand and gravel, industrial; soda ash; titanium dioxide pigment; wollastonite; zeolites; and zinc concentrates) or less than 20% net import reliant (abrasives, metallic; beryllium; cement; gypsum; iron and steel; iron and steel slag; lime; nitrogen (fixed)—ammonia; phosphate rock; pumice; sand and gravel, construction; stone, crushed; sulfur; and talc and pyrophyllite). For some mineral commodities (hafnium; mercury; quartz crystal, industrial; thallium; and thorium), not enough information is available to calculate the exact percentage of import reliance.

[2]Listed in descending order of import share.

[3]Data include lanthanides.

It's not just the U.S. As the IEA has stated, "the production of many energy transition minerals today is more geographically concentrated than that of oil or gas."[11] The *processing* of these minerals is even more concentrated.[12] China is the largest processor of copper, nickel, cobalt, lithium, and rare earths—processing between 35 percent and 85 percent of these minerals. For comparison, the newest aluminum production facility in the U.S. was built in 1980, according to CRS.[13]

Production of many energy transition minerals today is more geographically concentrated than that of oil or natural gas



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

Source: International Energy Agency World Energy Outlook Special Report

At the moment, the United States and the rest of the world are dependent on China to meet the growing demand for critical minerals and materials necessary for our energy. That doesn't have to be the case in the future. Over the last 15 years, the United States changed the world's energy landscape by

[11] International Energy Agency, *The Role of Critical Minerals in Clean Energy Transitions,* May 2021, https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions
[12] *Ibid.*
[13] Congressional Research Service, *U.S. Aluminum Manufacturing: Industry Trends and Sustainability*, Oct. 26, 2022, https://crsreports.congress.gov/product/pdf/R/R47294#:~:text=U.S.%20primary%20smelters%20use%20older,requires%20relatively%20large%20capital%20investments.

dramatically increasing our production of oil and natural gas. In 2012, President Obama said it was "stupid" to think that the United States could lower oil prices by drilling for more oil.[14] He argued that "drill, baby, drill" was just a bumper sticker and wouldn't work—that we couldn't drill our way to energy security.

But it turns out that we could drill our way to energy security. New technologies, including some where the Department of Energy played a key role on R&D, were critical to the massive increase in oil and gas production in the United States. But there is an indispensable part of the equation of the shale revolution that is overlooked—state and private ownership of the mineral estate. The oil and gas revolution that happened in the past 15 years wouldn't have happened if all of the shale resources were on federal lands. State and private lands were critical to the shale revolution and thankfully there are substantial shale resources in Texas, North Dakota, and Pennsylvania to name a few states.

Just as "drill, baby, drill" worked for oil and natural gas production, "mine, baby, mine" can work for minerals. However, the Biden administration is working to stifle any new mining in the United States. Just to name a few examples, the Biden administration has stymied the development of the Twin Metals and Polymet mines in Minnesota, the Resolution and Rosemount mines in Arizona, and the Pebble Mine in Alaska. They have also reduced access to the Ambler Mining District in Alaska. The Biden administration has been more disposed toward lithium mines, such as Rhyolite Ridge and Thacker Pass, but actual construction has only begun at Thacker Pass.

If the Biden administration wants to achieve its net zero goals, it should be aggressively working to open more mines in the United States.

[14] President Barak Obama, *Obama: 'The American People Aren't Stupid'*, Feb. 23, 2012, speech at the University of Miami, https://www.youtube.com/watch?v=wyFX2iM-dSE&ab

MINERAL PRODUCTION COMES AT A GREAT ENVIRONMENTAL COSTS IN DEVELOPING COUNTRIES

As the publication Deutsche Welle explains:[15]

> Securing just one ton of rare earth elements produces 2,000 tons of toxic waste, and has devastated large regions of China, said Günther Hilpert, Head of the Asia Research Division of the German think tank SWP.
>
> He says companies there have adopted a process of spraying acid over the mining areas in order to separate the rare earths from other ores, and that mined areas are often abandoned after excavation.
>
> "They are no longer viable for agricultural use," Hilpert said. "Nature has been overexploited."
>
> China is not the only country with low environmental standards and poor resource governance. In Madagascar, for example, a thriving illegal gem and metal mining sector has been linked to rainforest depletion and destruction of natural lemur habitats.
>
> States like Madagascar, Rwanda and the DRC score poorly on the Environmental Performance Index, which ranks 180 countries on factors including conservation, air quality, waste management and emissions. Environmentalists are therefore particularly concerned that these countries are mining highly toxic materials like beryllium, tantalum and cobalt.
>
> But it is not only nature that suffers from the extraction of high-demand critical raw materials.

[15] Michel Penke, *DW.com*, The toxic damage from mining rare elements, Apr. 13, 2021, https://www.dw.com/en/toxic-and-radioactive-the-damage-from-mining-rare-elements/a-57148185#:~:text=Securing%20just%20one%20ton%20of%20rare%20earth%20elements,Research%20Division%20of%20the%20German%20think%20tank%20SWP.

"It is a dirty, toxic, partly radioactive industry," Hilpert said. "China, for example, has never really cared about human rights when it comes to achieving production targets."

Dirty, toxic, radioactive: Working in the mining sector

One of the most extreme examples is Baotou, a Chinese city in Inner Mongolia, where rare earth mining poisoned surrounding farms and nearby villages, causing thousands of people to leave the area.

In 2012, British newspaper The Guardian described a toxic lake created in conjunction with rare earth mining as "a murky expanse of water, in which no fish or algae can survive. The shore is coated with a black crust, so thick you can walk on it. Into this huge, 10-square-kilometer [about 4-square-mile] tailings pond nearby factories discharge water loaded with chemicals used to process the 17 most sought after minerals in the world."

THE UNITED STATES IS THE GLOBAL LEADER IN OIL AND GAS PRODUCTION AND HAS HIGH ENVIRONMENTAL QUALITY

A recent study from the Institute for Energy Research[16] found that not only is the United States the global leader in oil and gas production, but the United States does so with very high environmental standards. The study found:

- For the 20 largest oil-producing countries outside the United States, the average EPI environmental score, weighted by liquid fuels production, is 39. When compared to the U.S. EPI

[16] David Kreutzer & Paige Lambermont, The Environmental Quality Index: Environmental Quality Weighted Oil And Gas Production, Feb. 2023, https://www.instituteforenergyresearch.org/wp-content/uploads/2023/02/IER-EQI-2023.pdf.

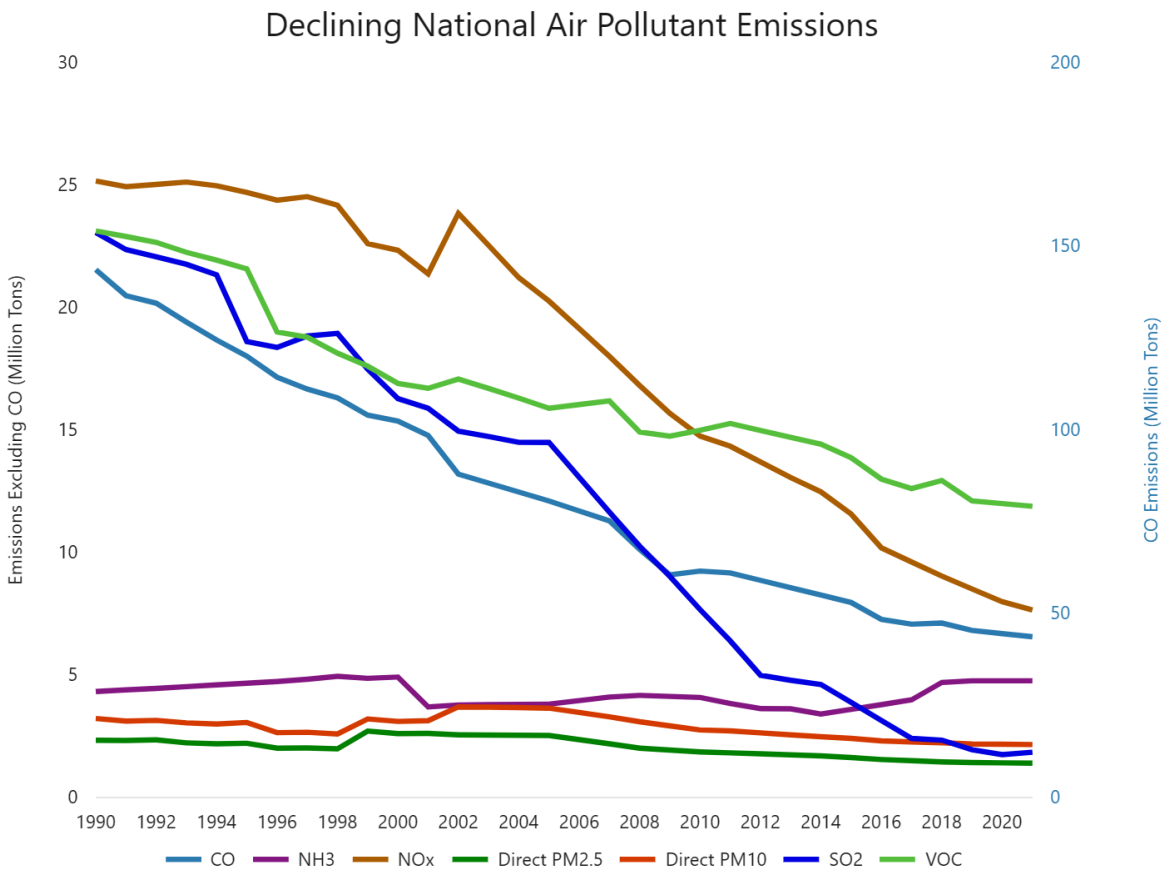
score of 51.1, it means the average barrel of non-U.S. petroleum is produced in a country with an environmental score that is 23.6% lower than that of the U.S.

- For the 20 largest non-U.S. natural gas producers, the average EPI environmental score weighted by production is only 38.6. So compared to the 51.1 EPI score of the U.S, the average bcf of natural gas is produced in a country with an environmental score that is 24.5% lower than that of the U.S.
- The United States, the world's largest producer of both oil and natural gas, is only outranked on environmental quality by 3 of the top 20 oil producers and 3 of the top gas producers. None of those countries produce even one-quarter of the volumes of oil or natural gas coming from the U.S. Indeed, all oil production from countries scoring higher on environmental quality amounts to only 35.7% of U.S. production, and that from gas-producing countries is only 33.4% of U.S. production. The sheer size of U.S. production combined with its excellent environmental standards means that U.S. production disproportionately reduces the environmental harms of oil and gas production on a global scale.
- U.S. production of crude oil and natural gas has increased over the last 40 years, while at the same time pollution and emissions have steadily and significantly declined across sources.
- Contrary to popular media characterizations, wealth created by energy development in free economies enhances environmental performance while making people's lives better.

CONCLUSION

The new energy economy the Biden administration is pushing for requires massive amounts of mineral and material resources. Much of these resources are currently produced in countries like China and the DRC, which have serious human rights and environmental problems. The United States has shown with

the shale revolution, that we can dramatically increase extractive industries and continue to improve our environment. For example, according to air quality data from EPA, pollution emissions in the United States continue to improve.[17]



The United States has vast mineral resources, but it is incredibly difficult to permit new mines in the United States today. To advance the energy economy the Biden administration is pushing for, they need to permit many, many new mines, as well as the processing facilities needed to make them useful. Our only operational rare earth mineral mine, for example, must export material to China to be processed to make it useable. In the United States, we can have high human rights standards, high environmental

[17] EPA, *Our Nation's Air: Trends through 2021*, https://gispub.epa.gov/air/trendsreport/2022/#home

standards, along with high production of mineral and energy resources. Producing energy and minerals in the United States helps build our energy security.