POWER THE FUTURE

THE FIGHT FOR RARE EARTHS

How Green Extremists Ignore China's Human Rights Record and Threaten U.S. National Security

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POWER THE FUTURE

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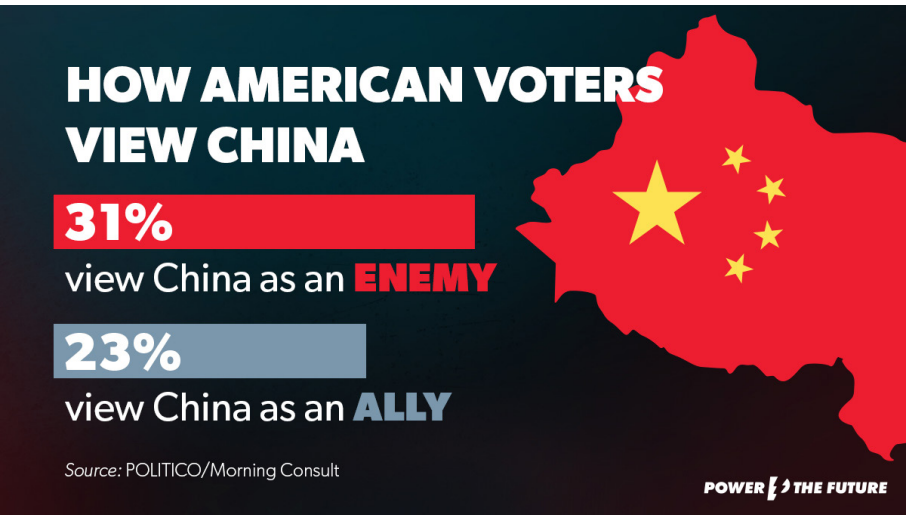
I. INTRODUCTION

If there were any doubt before the coronavirus pandemic, there's little now: China is not America's ally; it's not a "strategic competitor"; and it's not an adversary. Simply put, China is an enemy.

Americans increasingly believe this, as "anti-China sentiment is rising in the United States." A Politico-Morning Consult poll found that, since January, the notion of China as an "enemy" of America "has risen 11 percentage points to 31 percent, while the percentage of voters who say China is either an ally or friend has fallen 9 points to a combined 23 percent."[1]



This view likely stems from several factors. The Chinese Communist Party spent months deceiving the world about the severity of coronavirus, which experts have traced to the Chinese province of Wuhan. More broadly, China despises the freedom and values America espouses, as it transgresses basic human rights and suppresses free speech (see, for example, its latest actions in Hong Kong).

Seen in that light, coronavirus has exposed the unsettling fact that China controls, and even dominates, global supplies of many essential materials, including medical supplies. Rosemary Gibson of the Hastings Center warned last year that the public "have been kept in the dark about U.S. dependence on China for medicine and the health security and national security risks of this dependence."[2]

As Gibson said, "It's time to turn on the lights." In a March report, the Congressional Research Service (CRS) did just that. "China's role as a global supplier of medical personal protective equipment (PPE), medical devices, antibiotics, and active pharmaceutical ingredients," CRS wrote, "means reduced production or exports from China could lead to shortages and increased costs of critical medical supplies in the United States."[3] [emphasis added]

As if on cue, after Trump Administration officials speculated publicly about holding China accountable for the global spread of COVID-19, China's official Xinhua News Agency stated that if China stopped medical exports, "the

1 "Anti-China sentiment is on the rise," by Marc Caputo, Politico, March 20, 2020 (https://www.politico.com/news/2020/05/20/anti-china-sentiment-coronavirus-poll-269373).

2 Testimony of Rosemary Gibson, Senior Advisor, The Hastings Center and Author, "China Rx: Exposing the Risks of America's Dependence on China for Medicine," before the U.S.-China Economic and Security Review Commission "Exploring the Growing U.S. Reliance on China's Biotech and Pharmaceutical Products," July 31, 2019 (https://www.uscc.gov/sites/default/files/RosemaryGibsonTestimonyUSCCJuly152019.pdf).

3 "COVID-19: U.S.-China Economic Considerations," by Karen Sutter and Michael Sutherland, Congressional Research Service, updated March 2, 2020 (https://crsreports.congress.gov/product/pdf/IF/IF11434).

United States would sink into the hell of a novel coronavirus epidemic."[4]

Was China's COVID-19 threat idle or serious? Either way, it's clear that China, given its position, could certainly follow through on it, and severely damage the health and economic security of U.S. citizens.

II. RARE EARTH ELEMENTS/ CRITICAL MINERALS

Even more concerning, China's materials dominance extends beyond coronavirus. Many American citizens may not realize that parts in their phones, televisions, car batteries, and other everyday gadgets are largely controlled, in one way or another, by China. These components are made of "rare earth elements" (REEs) and other "critical minerals."[5]

What exactly are REEs?[6] As the U.S. Geological Survey (USGS) explained, REEs are integral components of more than 200 products across a wide range of applications, especially high-tech consumer products, such as cellular telephones, computer hard drives, electric and hybrid vehicles, and flat-screen monitors and televisions. They are also used in "significant defense applications," including "electronic displays, guidance systems, lasers, and radar and sonar systems."[7]

Despite their name, REEs are "relatively abundant in the Earth's crust." They are "rare" because "they are not found on their own, but rather as constituent parts of larger minerals, making extraction an expensive endeavor."[8] Here are some of the major U.S. industries that rely on REEs, according to the USGS[9]:

- **Glass:** REEs are used principally for "purposes of glass polishing and as additives to provide color and special optical properties to glass" (cerium, lanthanum, lutetium).

4 "Trump risks blowback from war of words with China over coronavirus," by Matt Spetalnick, David Brunnstrom, Andrea Shalal, Reuters, March 25, 2020 (https://www.reuters.com/article/us-health-coronavirus-usa-china-idUSKBN21C3KS).

5 In Executive Order 13817, "A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals," signed by President Trump on December 20, 2017, the term "critical minerals" is so named because each has been identified as a "non-fuel mineral or mineral material essential to the economic and national security of the United States, the supply chain of which is vulnerable to disruption, and that serves an essential function in the manufacturing of a product, the absence of which would have significant consequences for our economy or national security." (https://www.federalregister.gov/documents/2017/12/26/2017-27899/a-federal-strategy-to-ensure-secure-and-reliable-supplies-of-critical-minerals).

This report will focus mainly on rare earth elements, which are considered critical minerals. Pursuant to the executive order, the Department of the Interior published in February 2018 a draft list of 35 critical minerals, which was finalized, unchanged, on May 18, 2018 (https://www.americangeosciences.org/policy/news-brief/department-of-the-interior-finalizes-list-of-critical-minerals). The list "includes aluminum—used in almost all sectors of the economy; the platinum group metals—used for catalytic agents; rare-earth elements—used in batteries and electronics; tin—used as protective coatings and alloys for steel; and titanium—overwhelmingly used as a white pigment or as a metal alloy." (https://www.usgs.gov/news/interior-releases-2018-s-final-list-35-minerals-deemed-critical-us-national-security-and).

6 A precise, scientific definition of REEs from USGS: "The rare earth elements (REE) are fifteen elements with atomic numbers 57 through 71, from lanthanum to lutetium ("lanthanides"), plus yttrium (39), which is chemically similar to the lanthanide elements and thus typically included with the rare earth elements." (https://pubs.usgs.gov/sir/2010/5220/). REEs are also referred to as "Rare Earth Minerals" and "Rare Earth Metals."

7 "What are rare earth elements and why are they important?" American Geosciences Institute (https://www.americangeosciences.org/critical-issues/faq/what-are-rare-earth-elements-and-why-are-they-important).

8 "Rare Earths: Next Element in the Trade War?" by Grace Hearty, Center for Strategic and International Studies, August 20, 2019 (https://www.csis.org/analysis/rare-earths-next-element-trade-war).

9 "Rare Earth Elements: Critical Mineral Resources of the United States; Economic and Environmental Geology and Prospects for Future Supply," USGS (https://www.pmf.unizg.hr/_download/repository/pp1802o.pdf).

- **Petroleum Refining:** "Catalysts enriched in REEs are essential to cracking (breaking down) heavy hydrocarbon molecules into smaller molecules" (lanthanum).
- **Automotive:** "Catalysts in catalytic converters help reduce automotive carbon monoxide emissions"; "nickel-metal hydride batteries in hybrid electric cars" (lanthanum, neodymium, praseodymium, and yttrium).
- **Steel:** Various REEs help remove impurities in steelmaking (Cerium, lanthanum, neodymium, and praseodymium).
- **Televisions/LED Lighting:** "Used individually or in combination to make phosphors for many types of cathode ray tube and flat panel display screens, and in some incandescent, fluorescent, and light-emitting diode lighting" (yttrium, cerium, lanthanum, europium, and terbium).
- **Medical/Health:** REE-based phosphors are used in X-ray imaging and magnetic resonance imaging (MRIs) (gadolinium).

The USGS reports that REEs are also used in "synthetic gems, crystals for lasers, microwave equipment, superconductors, sensors, nuclear control rods, and cryo-coolers." Moreover, "significant potential new uses for REEs include their use as nano-filters and in memory devices, power converters, optical clocks, infrared decoy flares, and fusion energy."[10]

These aren't household names, or things consumers think about; but they are essential for America's economic well-being. In a white paper published earlier this year, the Department of Energy (DOE) noted that the "assured supply of critical materials and the resiliency of their supply chains are essential to the economic prosperity and national defense of the United States." "The manufacturing and deployment of these goods," DOE wrote, "provides employment for American workers and contributes to U.S. economic growth."[11]

III. CHINA'S DOMINANCE

Experts have known for years that China exercises staggering leverage over the U.S. with respect to REEs and critical minerals. And just as with COVID-related necessities, China is aggressively exploiting its position. "China's rare earth producers, who control the lion's share of the world's output of the elements," the South China Morning Post reported last year, "said they are ready to use their dominance of the industry as a weapon in the country's year-long trade war with their customers in the United States."[12]

These threats are not new, or confined solely to the U.S. In 2010, after a Chinese fishing trawler collided with a Japanese coast guard ship near disputed islands, China dramatically reduced REE exports to Japan, forcing it to seek imports from Australia and India. Japan eventually conducted its own research and development on REEs, and by 2017, turned to Vietnam, which became the largest source of Japan's REE imports.[13]

10 Supra at 9.

11 "Critical Materials Rare Earths Supply Chain: A Situational White Paper," The Department of Energy, page 1, April 2020 (https://www.energy.gov/sites/prod/files/2020/04/f73/Critical%20Materials%20Supply%20Chain%20White%20Paper%20April%202020.pdf).

12 "China's rare earth producers say they are ready to weaponise their supply stranglehold, pass any tariff as cost to US customers," by Eric Ng, South China Morning Post, August 8, 2019 (https://www.scmp.com/business/commodities/article/3021947/chinas-rare-earth-producers-say-they-are-ready-weaponise-their?utm_medium=email&utm_source=mailchimp&utm_campaign=enlz-usmorningbrief&utm_content=20190808&MCUID=951433ab40&MCCampaignID=58af907b69&MCAccountID=3775521f5f542047246d9c827&tc=2).

13 Supra at 8.

Then-Secretary of State Hillary Clinton called China's action "a wake-up call,"[14] but "little action was taken by other countries reliant on imports to diversify their resources or develop minerals action plans of their own," including the United States.[15] Why does this matter? Among other things, China's actions, enforced through quotas, licenses, and taxes, "led to record high prices for REEs," and as a result, highlighted "the potential supply risks and supply chain vulnerability for rare earths and other raw materials and metals needed for national defense, energy technologies, and the electronics industry, among other end uses."[16]

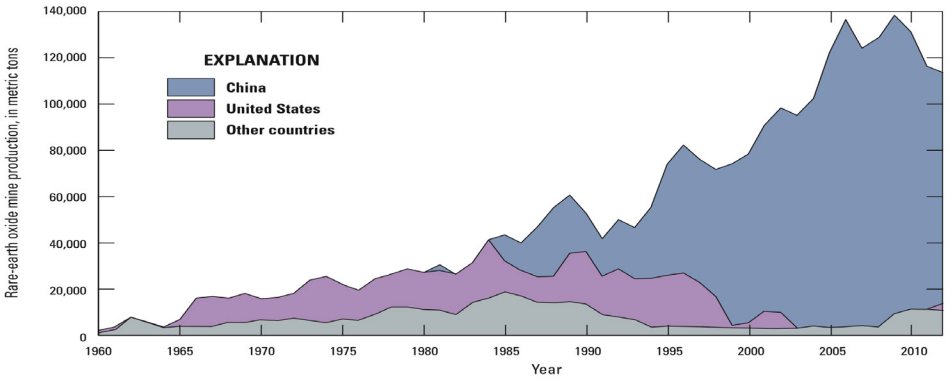


Figure 01. Graph showing world mine production of rare-earth oxides, by country and year, from 1960 to 2012. The layers of the graph are placed one above the other, forming a cumulative total. Data are from U.S. Bureau of Mines (1961–96) and U.S. Geological Survey (1997–2016).

20

In the latter half of the twentieth century, the U.S. was "self-sufficient" in REEs, producing "well over half of the world's supply" until the 1980s.[17] But over time, due to several factors, China eclipsed the U.S., and indeed the rest of the world. "Since the late 1990s, China has provided 85-95 percent of the world's REEs,"[18], while, between 2014 and 2017, the U.S. imported 80 percent of its supply from China.[19]

What happened? In 1992, Deng Xiaoping, China's then-leader, said

14 "Xi Jinping Flexes China's Trade Muscle With Visit To Rare-Earths Hub," by James Areddy, Wall Street Journal, May 21, 2019 (https://www.wsj.com/articles/xi-jinping-flexes-china-s-trade-muscle-with-visit-to-rare-earths-hub-11558442724).

15 "Mining the Future: How China is set to dominate the next Industrial Revolution," FP Analytics Special Report, May 1, 2019 (https://foreignpolicy.com/2019/05/01/mining-the-future-china-critical-minerals-metals/).

16 Congressional Research Service, "Critical Minerals and U.S. Public Policy," by Marc Humphries, June 28, 2019 (https://crsreports.congress.gov/product/pdf/R/R45810/2).

17 "Digging Deeper: Rare Earth Metals and the U.S.-China Trade War," by Felix K. Chang, Foreign Policy Research Institute, June 21, 2019 (https://www.fpri.org/article/2019/06/digging-deeper-rare-earth-metals-and-the-u-s-china-trade-war/).

18 "The Rare Earth Elements—Vital to Modern Technologies and Lifestyles," U.S. Geological Survey Mineral Resources Program, November 2014 (https://pubs.usgs.gov/fs/2014/3078/pdf/fs2014-3078.pdf).

19 "U.S. dependence on China's rare earth: Trade war vulnerability," Reuters, June 27, 2019 (https://www.reuters.com/article/us-usa-trade-china-rareearth-explainer/u-s-dependence-on-chinas-rare-earth-trade-war-vulnerability-idUSKCN1TS3AQ).

20 "How rare earth shocks lifted an upstart Australian mining company," by Melanie Burton, Yuka Obayashi, and Aaron Sheldrick, Reuters, December 17, 2019 (https://cn.reuters.com/article/uk-rareearths-lynas-focus-idUKKBN1YL0RV).

that while "the Middle East has oil, China has rare earths."[21] Deng and Chinese Communist officials set out to dominate REEs. They did this by "strategically flooding" the global REE market and

"the Middle East has oil, China has rare earths."

pumping up Chinese state subsidies for favored companies. When these typical Chinese tactics were "coupled with lower labor costs and less stringent environmental standards," the rest was history, enabling "China's rare-earth rise."[22]

In 2016, as it launched its "Made in China 2025" initiative, which aims to "build strategic industries in defense, science, and technology," China empowered its Ministry of Industry and Information Technology to produce an "action plan for its metals industry to achieve world-power status." "By deploying state-owned enterprises and private firms to resource-rich hot spots around the globe," according to Foreign Policy magazine, "China would develop and secure other countries' mineral reserves—including minerals in which China already holds a dominant position."[23]

All over the globe, China bought mines, purchased equity stakes in mines, and forged long-term agreements to takeover mining companies' supplies, all with the goal, since achieved, of gaining "outright control or influence over large shares of the global production of these resources."[24]

America's vulnerability is not just about China's supply of REEs; China also overwhelmingly controls the processing of certain REEs. According to the Center for Strategic and International Studies, Chinese firms "control more than 85 percent of the costly processing stage of the supply chain and produced more than 70 percent of the world's rare-earth-metal supply in 2018."[25]

While that number is lower than the eye-popping 97 percent in 2009, it still is unacceptably high.[26]

And keep it mind that it would take "years to build enough processing plants to match China's processing capacity of 220,000 tonnes—which is five times the combined capacity of the rest of the world."[27] As Foreign Policy magazine explained, "the critical bottleneck for the United States, and especially the defense sector, isn't access to rare-earth ores…it's that the rest of the value chain—processing those ores, refining them into metals, and turning that metal into advanced products like permanent magnets—is dominated by China."[28]

IV. GREEN GROUPS AND REES

Our radical dependency on China for REEs, Department of Commerce has argued, "creates a strategic vulnerability for both our economy and our military with respect to adverse foreign government

21 "Rare earths give China leverage in the trade war, at a cost," The Economist, June 15, 2019 (https://www.economist.com/china/2019/06/15/rare-earths-give-china-leverage-in-the-trade-war-at-a-cost).

22 Supra at 8.

23 Supra at 15.

24 Supra at 15.

25 Supra at 8.

26 "China denies banning rare earths exports to Japan," Reuters, September 23, 2010 (https://www.reuters.com/article/us-china-japan-minerals/china-denies-banning-rare-earths-exports-to-japan-idUKTRE68M0PF20100923).

27 Supra at 19.

28 "U.S. Falters in Bid to Replace Chinese Rare Earths," by Keith Johnson and Robbie Gramer, Foreign Policy, May 25, 2020 (https://foreignpolicy.com/2020/05/25/china-trump-trade-supply-chain-rare-earth-minerals-mining-pandemic-tensions/).

actions, natural disasters, and other events that could disrupt supply."[29] Of course, environmental activists don't think, or care, about these vulnerabilities. By opposing greater U.S. production and development of REEs, green activists are fueling China's dominance.

For them, China's significant influence over REEs is irrelevant. Their overarching concern is fomenting a green utopia, in the form of a "zero-carbon future," in which renewable technologies, e.g., wind, solar, electric vehicles, and electric batteries, will (they say) provide well-paying jobs, energy security, a cleaner environment, and protect the world from unchecked climate change. We'll all die, they say, unless we have a complete renewable future.

In a report about REEs sponsored by radical activist group Earthworks, the authors state that the "transition to a 100% renewable energy system is urgently needed to meet the goals of the Paris Climate Agreement and increase the chance of keeping global temperature rise below 1.5 degrees."[30] But green radicals have a big problem. They can ignore China all they want, but their perfect renewable future depends on REEs—lots of them.

According to an article in the scientific journal Nature, the transition to a low carbon society is "a change that will require vast amounts of metals and minerals." More to the point, "mineral resourcing and climate change are inextricably linked, not only because mining requires a large amount of energy, but also because 'the world cannot tackle climate change without adequate supply of raw materials to manufacture clean technologies.'"[31]

"...the most aggressive climate targets (limiting warming to a two-degree Celsius increase) will increase demand for aluminum, cobalt, iron, lead, lithium, manganese, and nickel more than 1000 percent."

In 2017, the World Bank reached a similar conclusion, posing a challenge for activists clamoring for the U.S. and other countries to meet the emissions reductions goals of the 2015 Paris Climate Agreement. To do that "would require significant production of minerals and metals," the World Bank found, "including aluminum, copper, lead, lithium, manganese, nickel, silver, steel, zinc, and rare earth elements (REEs)."[32]

In the case of minerals required for lithium-ion batteries, which are used for electric vehicles, the

29 "A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals," Department of Commerce, June 4, 2019 (https://www.commerce.gov/sites/default/files/2020-01/Critical_Minerals_Strategy_Final.pdf).

30 Dominish, E., Florin, N. and Teske, S., 2019, ***Responsible Minerals Sourcing for Renewable Energy***. Report prepared for Earthworks by the Institute for Sustainable Futures, University of Technology Sydney (https://earthworks.org/cms/assets/uploads/2019/04/MCEC_UTS_Report_lowres-1.pdf).

31 "Mineral Supply for Sustainable Development Requires Resource Governance," by Ali, Saleem H., Damien Giurco, Nicholas Arndt, Edmund Nickless, Graham Brown, Alecos Demetriades, Ray Durrheim, and others, Nature, 2017; "The Growing Role of Metals and Minerals in a Low Carbon Future," World Bank Group, p. xvi, June 2017 (http://documents.worldbank.org/curated/en/207371500386458722/pdf/117581-WP-P159838-PUBLIC-ClimateSmartMiningJuly.pdf).

32 Background Memorandum, Senate Committee on Energy and Natural Resources, hearing to examine the use and sourcing of minerals needed for clean energy technologies, September 14, 2019, based on Arrobas, Daniele La Porta; Hund, Kirsten Lori; McCormick, Michael Stephen; Ningthoujam, Jagabanta; Drexhage, John Richard. 2017. ***The Growing Role of Minerals and Metals for a Low Carbon Future***. Washington, D.C., World Bank Group. (http://documents.worldbank.org/curated/en/207371500386458722/The-Growing-Role-of-Minerals-and-Metals-for-a-Low-Carbon-Future).

report concludes "that the most aggressive climate targets (limiting warming to a two-degree Celsius increase) will increase demand for aluminum, cobalt, iron, lead, lithium, manganese, and nickel more than 1000 percent."[33] [emphasis added]

The leftist online site Vice expressed similar concern in 2018. As noted at the time, to meet targets under the Paris Agreement, "global production of several rare earth minerals used in solar panels and wind turbines—especially neodymium, terbium, indium, dysprosium, and praseodymium—must grow twelvefold by 2050."[34]

The author pointed to a Dutch study warning of REE shortages. The study assumed the rest of the world would accelerate renewable energy production at a pace like the Netherlands. Some may say this is unreasonable. But why shouldn't the public take the environmental community at their word? It's an article of faith among them that the U.S. must achieve a 100-percent renewable energy system by 2030 to prevent planetary disaster.[35]

According to the Dutch study, the "current global supply of several critical metals is insufficient to transition to a renewable energy system." If the rest of the world "would develop renewable electricity capacity at a comparable pace with the Netherlands," the study's authors concluded, "a considerable shortage would arise." And this conclusion doesn't include other applications of REEs: "When other applications (such as electric vehicles) are also taken into consideration," Metabolic wrote, "the required amount of certain metals would further increase."[36]

It's also worth noting that, according to the International Energy Agency (IEA), renewables "generally require more minerals than fossil fuel-based counterparts." [emphasis added] As an example, the IEA pointed to electric vehicles:

> *An electric car uses five times as much minerals as a conventional car and an onshore wind plant requires eight times as much minerals as a gas-fired plant of the same capacity. Even in fossil fuel-based technologies, achieving higher efficiency and lower emissions relies on the extensive use of minerals. For example, the most efficient coal-fired power plants require a lot more nickel than the least efficient ones in order to allow for higher combustion temperatures.[37] [emphasis added]*

To reduce America's vulnerability to China, the Trump Administration, via the Department of Commerce, released a strategy last year to promote critical minerals development in the U.S. Among other things, Commerce recommended improving "access to domestic critical mineral resources on federal lands" and reducing "federal permitting timelines," and strengthening "America's critical

33 Ibid.

34 "We Don't Mine Enough Rare Earth Metals to Replace Fossil Fuels with Renewable Energy," by Nafeez Ahmed, Vice, December 12, 2018 (https://www.vice.com/en_us/article/a3mavb/we-dont-mine-enough-rare-earth-metals-to-replace-fossil-fuels-with-renewable-energy).

35 "Vision for Equitable Climate Action," US Climate Action Network, May 2020. P. 6: "Target a just and equitable transition to 100% renewable energy by 2030." (https://equitableclimateaction.org/wp-content/uploads/2020/05/Vision-for-Equitable-Climate-Action-May-2020-final-1.pdf).

36 "Metal Demand for Renewable Electricity in the Netherlands: Navigating a Complex Supply Chain," by Pieter van Exter, Sybren Bosch, Branco Schipper, Dr. Benjamin Sprecher, and Dr. René Kleijn, Metabolic, 2018, English translation commissioned by the Dutch Ministry of Infrastructure and Water Management (https://www.metabolic.nl/publications/metal-demand-for-renewable-electricity-generation-in-the-netherlands-pdf/).

37 "Clean energy after the COVID-19 crisis will need reliable supplies of critical minerals," by Tae-Yoon Kim and Milosz Karpinski, International Energy Agency, May 6, 2020 (https://www.iea.org/articles/clean-energy-progress-after-the-covid-19-crisis-will-need-reliable-supplies-of-critical-minerals).

minerals supply chains and defense industrial base."[38] The plan is sensible and intended to break America's dependence on China for REEs and critical minerals.

But instead of a practical strategy to weaken China's dominance, end child labor, and increase environmentally protective mining in the U.S., the Sierra Club has offered only the usual pabulum about the need to protect "front-line communities" from the "climate crisis."

The Sierra Club, however, attacked the strategy as "dangerous," because, they claimed, it "puts mining companies first, before the needs of communities and workers and at the cost of some of our most important landscapes."[39] In a statement posted last year, Sierra Executive Director Michael Brune acknowledged that critical mineral mining is "problematic," as much of "the world's cobalt," he wrote, "currently comes from the Democratic Republic of the Congo, where so-called artisanal (or small-scale) mining is rife with pollution and human rights violations, including child labor."[40]

But instead of a practical strategy to weaken China's dominance, end child labor, and increase environmentally protective mining in the U.S., the Sierra Club has offered only the usual pabulum about the need to protect "front-line communities" from the "climate crisis." A mining "strategy," by their lights, "must consider the effects on our environment and respect our nation's most iconic places, and ensure that the clean energy economy doesn't replicate the problems of the fossil fuel economy."[41]

Of course, no mention of China or national security. And no mention, either, of China's abysmal environmental record, especially when it comes to REE mining. As documented in a report published by YaleEnvironment360, unlike in the U.S., where mining is heavily regulated under the world's most stringent environmental regulations, China's REE mining is largely unregulated, leaving environmental devastation in its wake. Though local provinces are taking steps to stem the damage, the results—in this case, in Jiangxi—are predictably tragic:

> *Today, concrete leaching ponds and plastic-lined wastewater pools dot the hills. At one abandoned site, large wastewater ponds sit uncovered and open to the elements. Satellite images show dozens of similar pools dotting the mountains, all just one landslide or barrier failure away from a spill of their contaminated contents into waterways or groundwater.*[42]

38 Supra at 29.

39 "Sierra Club Reacts to Trump Administration Plan to Open More Critical Mineral Mines," Sierra Club, June 6, 2019 (https://www.sierraclub.org/press-releases/2019/06/sierra-club-reacts-trump-administration-plan-open-more-critical-mineral-mines).

40 "Of Change and Heart," by Michael Brune, Sierra Club, April 18, 2019 (https://www.sierraclub.org/articles/2019/04/renewables-mining-rare-earth-elements).

41 Supra at 39.

42 "China Wrestles with the Toxic Aftermath of Rare Earth Mining," by Michael Standaert, YaleEnvironment360, July 2, 2019 (https://e360.yale.edu/features/china-wrestles-with-the-toxic-aftermath-of-rare-earth-mining).

"I am troubled…that the world's reliance on Chinese rare earth materials," he wrote, "in combination with China's apparent willingness to use this reliance for leverage in wider international affairs, poses a potential threat to American economic and national security interests."

Sen. Ed Markey

Sen. Ed Markey (D-MA), a green liberal icon, previously spoke out against China's control over REEs. Markey at once seemed to understand the connection between the green economy and access to critical minerals—and China's ability to break it.

In 2010, when he served in the House as chairman of the Select Committee on Energy Independence and Global Warming, Markey expressed alarm over China's action, noted earlier, to restrict REE exports to Japan. "I am troubled…that the world's reliance on Chinese rare earth materials," he wrote, "in combination with China's apparent willingness to use this reliance for leverage in wider international affairs, poses a potential threat to American economic and national security interests."[43]

V. CONCLUSION

Yet Markey's attack on China is now lost in the historical ether. He and his green activist allies seem to care little about China's dominance over what they hold dear: an economy powered by 100 percent renewable energy.

Green radicals instead insist that mining for REEs and other critical minerals can be reduced over time, replaced by mineral recycling, all part of what greens call "the circular economy." According to Eva Gladek, founder of Metabolic, a Dutch data science firm focused on the energy transition, "It is essential for us to manage materials in a circular fashion in order to ensure that we have enough for the technologies critical to a low-carbon future."[44]

Currently, however, "recycling rates for critical metals are at below 1 percent, and some rare earth metals aren't recycled at all."[45] This is essentially what the United Nations Environment Programme (UNEP) found in 2011: "In spite of significant efforts in a number of countries and regions," the report glumly notes, "many metal recycling rates are discouragingly low, and a 'recycling society' appears no more than a distant hope."[46]

China is not operating on distant hopes. And they seem to care nothing for green activists and their obsessions about climate change and renewable energy. They are focused on expanding their power and influence over the world's most precious resources—and keeping America on bended knee.

Last year, in a piece provocatively headlined, "United States, don't underestimate China's ability to strike back," People's Daily, China's official Communist Party news outlet, highlighted America's "uncomfortable" dependence on China for REEs. And it posed this ominous question:

43 "Markey Presses Pentagon on China's rare-earth policy," by Ben Geman, The Hill, October 21, 2010 (https://thehill.com/policy/energy-environment/125289-markey-presses-pentagon-energy-dept-on-chinas-rare-earth-restrictions).

44 Supra at 34.

45 Supra at 34.

46 "World metal recycling 'discouragingly low', says new UN report," UN News, May 26, 2011 (https://news.un.org/en/story/2011/05/376392-world-metal-recycling-discouragingly-low-says-new-un-report).

"Will rare earths become a counter weapon for China to hit back against the pressure the United States has put on for no reason at all? The answer is no mystery."[47]

47 "China ready to hit back against US with rare earths: newspapers," by Ben Blanchard, Michael Martina and Tom Daly, Reuters, May 28, 2019 (https://www.reuters.com/article/us-usa-trade-china-rareearth/china-ready-to-hit-back-at-u-s-with-rare-earths-ruling-party-newspaper-idUSKCN1SZ07V).