

- **OBAMA GAVE HIS SILICON VALLEY OLIGARCHS THE RARE-EARTH METALS EXCLUSIVES IN EXCHANGE FOR WEB RIGGING HIS ELECTION AND NOW IT IS BITING THEM IN THE BUTT**
-
- by:
[Dan Maloney](#)

It seems these days that the news is never good. Speaking from experience, that's really nothing new; there's always been something to worry about, and world leaders have always been adept at playing the games that inevitably lead to disturbing news. Wars always result in the very worst news, of course, and putting any kind of modifier in front of the word, like "Cold" or "proxy", does little to ameliorate the impact.

And so the headlines have been filled these last months with stories of trade wars, with the primary belligerents being the United States and China. We've covered a bit about how tariffs, which serve as the primary weapons in any trade war, have impacted the supply of electronic components and other materials of importance to hackers.

But now, as the trade war continues, a more serious front is opening up, one that could have serious consequences not just to the parties involved but also to the world at large. The trade war has escalated to include rare earth metals, and if the threats and rumors currently circulating come to fruition, the technologies and industries that make up the very core of modern society will be in danger of grinding to a halt, at least temporarily.

Bottom Line: Not So Rare

So what even are rare earth metals, and what's so rare about them? To start with, the rare earth elements occupy the lanthanide series on the periodic table – the top row of the two that are often split off the main table, a lot like Alaska and Hawaii are transported to the Gulf of Mexico in maps of the United States. The fifteen lanthanides are joined by two metals, scandium and yttrium, from the third periodic series, mainly because they are all often found together in mineral deposits and because they have similar properties.

Leaving out the radioactive rare earth element promethium, of which there is barely half a kilogram total occurring naturally in the entire Earth's crust, the 16 other rare earth metals are not even remotely rare. Cerium, a soft silver-gray metal, is actually more abundant than copper in the Earth's crust, and there's enough of it that it's been in common use in industry, primarily as a catalyst, in ceramics, in lighter flints, and as a coating for gas lamp mantles, since the 1800s. Even the rarest of the rare earth metals is 200 times more abundant than gold.

["Big magnet on a yellow seat"](#) by [daveypea](#) is licensed under [CC BY-NC-SA 2.0](#)

The rare earth elements – again, with the exception of promethium, which is formed by radioactive decay of uranium – are all gifts from our galactic neighbors. They were forged in the furnaces of nearby stars and blown into space by supernovae, to collect as the dust that would eventually condense into our rocky world. They've

collected in deposits of various minerals sprinkled around the world, from the Scandinavian peninsula where scandium gets its name, to South Africa, Brazil, Russia, California, and southern China. Rare earth elements have even been found in abundance in the mud at the bottom of the Pacific Ocean, apparently belched up from the Earth's interior by deep-sea hydrothermal vents.

The rare earth elements are all metals and share many of their useful properties, like being highly conductive, malleable, and ductile. That means they can be alloyed with other more common metals, lending certain properties to the alloy. Many of the rare earth elements also have catalytic properties, leading to their use in industrial chemical processes. The rare earths also tend to form brightly pigmented oxides thanks to their electronic structure, making them common components of pigments and dyes.

But perhaps the most important use for rare earth elements today is in powerful, lightweight magnetic alloys. Rare earths like neodymium and samarium are ferromagnetic, meaning they can be turned into permanent magnets. Pure rare earth metals lose their ferromagnetic properties at a fairly low temperature, but when alloyed with other ferromagnetic elements such as cobalt and iron, they form extremely powerful permanent magnets thanks in part to the unpaired electrons present in their outermost orbital shell.

The Catch

While rare earth metals are not particularly rare, they also tend not to be very concentrated. Even the richest deposits of rare-earth ores still contain only a small amount of each metal, and generally multiple metals with very similar properties are found in the same ore. So while finding rare earth ores is easy, refining commercially viable amounts of the stuff from the vast amount of overburden is no mean feat.

What's worse is that not every deposit has the most useful rare earths, which tend to be the heavier elements. The richest deposits are found in mines in China, which currently supplies 100% of the world's heavy rare earths, such as dysprosium, which is needed for the rare-earth magnets in hard disk drives among other things. China also has built out a vast value-add chain for its rare earth, from refining the raw ores to finished metals and oxides to turning them into finished products. When you buy anything with a rare earth element in it, chances are good that it came from China.

Baiyunbo Mine, from satellite. NASA

With rare earth elements, all roads lead to China, and that is the crux of the current trade dispute. Rare earth elements have become so integral to so many technologies that entire industries could be destroyed if China were to limit exports or enact tariffs on them. As a result, China appears to have the upper hand in this matter – at least for now.

China is the world's rare-earth supermarket not just because of its rich mineral deposits but also because of its somewhat relaxed environmental regulations. Refining and separating rare earths are dirty processes involving a lot of harsh chemicals and generating vast amounts of waste. Other rare earth mines, like the Mountain Pass Mine in California that once supplied most of the world's finished metals and oxides, were shut down by environmental restrictions that started to make them economically unfeasible.

Reduce, Reuse, Recycle

Mountain Pass, however, is seeing a renaissance. Bought out of bankruptcy in 2017, Mountain Pass resumed mining and concentrating rare earth ores in 2018. They currently ship the concentrate to China for refining, but are tooling up for refining on site, and claim that they'll be fully self-sufficient from Chinese refiners by 2020. Whether this leads to a full value-add chain outside of China remains to be seen, but at least it would mean that the world would have an alternative to China for refined rare-earth metals and their oxides.

There's also hope coming from other mining industries. As mentioned above, rare earths are not especially rare, and almost anything mined anywhere produces tailings that have significant amounts of rare earth ores. It's not commercially viable to recover them, though, and so most of those valuable minerals go right back into the ground, or get washed away when the primary ore from the mine is processed. That's the case with the coal mines of Appalachia, where acid wastewater from coal processing has been found to contain recoverable amounts of rare earth elements. A pilot program is currently underway, and if it pans out, tailings and waste from coal mines, iron mines, and pretty much any other hole in the ground may someday produce a valuable side product that can alleviate the current rare earth crunch.



Rare earth metals have become indispensable, and any modern economy needs a steady supply to operate. The economic forces that created the current supply pinch will surely be the same forces that dictate the eventual

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66 thoughts on “Rare Earth Metals Caught in Trade War”

1. **Ren** says:

[June 4, 2019 at 7:17 am](#)

Here is an article about an island in Sweden that has 4 elements named after it, and 3 other rare earths discovered there.

http://www.slate.com/articles/health_and_science/elements/features/2010/blogging_the_periodic_table/ytterby_the_tiny_swedish_island_that_gave_the_periodic_table_four_different_elements.html

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1. **Kevin Kessler** says:

[June 4, 2019 at 7:52 am](#)

Interesting article, thanks.

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2. **2ftg** says:

[June 4, 2019 at 10:11 am](#)

Ytterby has the best name. “The village in the middle of nowhere”, if roughly translated.

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1. **M Barland** says:

[June 4, 2019 at 6:55 pm](#)

They’re very literal with their names in that part of the world. I always liked Longyearbyen. Literally “long year town.”

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1. **Peter Neilson** says:

[June 5, 2019 at 6:51 am](#)

Yes, literally, but it’s named after John Munro Longyear of Michigan.

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2. **Luke** says:

[June 5, 2019 at 7:43 am](#)

There's a letter of the alphabet in Swedish that's written Ö and pronounced more or less like a cross between "oh" and "ugh".

The letter Ö is also a word, meaning "island". Another word for "hay" is spelled "hö", and the word for "maiden" is "mö"... there's also "öde" which is an adjective meaning "desolate". So the poem goes:

Ö. Ö. Hö ö. Öde ös mö.

Said out it sounds like a neanderthal version of Swedish Chef.

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2. **Johan Carlsson** says:

[June 5, 2019 at 11:43 am](#)

And if exactly translated it means "Outer Village"

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3. **Ren** says:

[June 5, 2019 at 8:43 am](#)

Thanks for all of your responses!
They have been enlightening and entertaining!

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2. **Ostracus** says:

[June 4, 2019 at 7:34 am](#)

<https://www.theverge.com/2019/5/23/18637071/rare-earth-china-production-america-demand-trade-war-tariffs>

Plus

<https://investingnews.com/daily/resource-investing/critical-metals-investing/rare-earth-investing/rare-earth-producing-countries/>

Point being we could get what's needed from friendly countries, but just not as cheap as China.

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3. **Cbob** says:

[June 4, 2019 at 8:00 am](#)

Thank you for the informative and hysteria filled article. I eagerly await entire industries grinding to a halt.

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1. **Ostracus** says:

[June 5, 2019 at 7:29 pm](#)

Grinding no. Costing more? Yes.

<https://www.houzz.com/magazine/heres-why-kitchen-and-bath-renovations-are-costing-more-stsetivw-vs~121694354>

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4. **Doug Coulter** says:

[June 4, 2019 at 8:02 am](#)

Hmmm, for years, the story I heard was that pretty much all rare earth ores had lots of thorium in them and the EPA + NIMBY basically made it impossible to run a mining/extraction operation due to the radioactive tailings along with the usual pollution from chemical processes used for difficult to separate elements. When I did stock trading, there was great excitement for a little while about an American mine and refiner – long gone, as the Chinese utterly clobbered it on prices due to our regulations.

Not passing judgement, just reporting what I remember from that time.

<https://en.wikipedia.org/wiki/Molycorp>

[https://www.google.com/search?](https://www.google.com/search?q=Rare+Earth+ores+and+thorium&gs_ivs=1#tts=0)

[q=Rare+Earth+ores+and+thorium&gs_ivs=1#tts=0](https://www.google.com/search?q=Rare+Earth+ores+and+thorium&gs_ivs=1#tts=0)

Wonder why the author skipped this pretty widely-known batch of issues?

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1. **Elliot Williams** says:

[June 5, 2019 at 4:57 am](#)

He did mention that the US has rare earths in the ground, but that extracting them was too environmentally unfriendly, so that business is done in China under more environmental-catastrophe-friendly policies.

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1. **Winston** says:

[June 5, 2019 at 7:24 am](#)

The US is rich with rare earth ores. They are also the byproducts of other refining processes like that involved in producing iron. It's only the COST of their extraction in the US due to the cost of the handling and disposal of radioactive thorium usually present with the rare earth elements that has stupidly led to China's monopoly. They can do it cheaper because they will dump anything anywhere, something I seriously hope comes back to really bite them in the ass some day (10% of the air pollution in the US is from China and about that concern about plastics in the ocean, 3.53 million metric tons of plastics are dumped into the ocean by China every year. Indonesia is in second place with 3.2 million while the US contributes 0.11 million.).

The US could have all of the domestically produced rare earth metals it could ever want nearly overnight, just at a higher cost.

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1. **mredmon** says:

[June 6, 2019 at 6:05 pm](#)

Sounds like we need a bunch of nuclear reactors that run on thorium. 2 birds, 1 stone.

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5. **[Douglas L Coulter](#)** says:

[June 4, 2019 at 8:11 am](#)

Search google for "Rare earth ore and thorium" and wikipedia for "moly corp" for more. Many people sounded the alarm about letting China have the whole market a decade or more ago.

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1. **Wolfgang Black** says:

[June 4, 2019 at 4:46 pm](#)

yet thorium could be used for producing electricity in nuclear power plants better than the currents ones we have....

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1. **Steve** says:

[June 5, 2019 at 6:30 pm](#)

no

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6. **CW** says:

[June 4, 2019 at 8:19 am](#)

This bow down to China or else must be new generation thing. No thanks. The world can do without human rights abusers. And the idea that the USA is incapable of mining some dirt is garbage. Why does this site kowtow to China? Serious question.

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1. **Miroslav** says:

[June 4, 2019 at 11:54 am](#)

Ummm ... US corporations have moved to China to earn more money. And now, kid in the body of an adult is trying to reverse the 30 years policy in short span of time.

In short, blame US system of capitalism at all costs.

“Money and the power, power and the money, minute after minute, hour after hour”

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1. **Jake** says:

[June 4, 2019 at 12:14 pm](#)

At least when it comes to rare earths, we moved to China due to the lack of environmental protections. Don't blame capitalism; blame short sighted consumers who still want their new iPhone, but want to stay ignorant about the toll on the environment (that they claim to love) it takes.

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1. **NachtRitter** says:

[June 4, 2019 at 5:49 pm](#)

Still comes down to capitalism... path of lowest cost in order to receive the greatest profit...

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1. **Luke** says:

[June 5, 2019 at 7:53 am](#)

China has an extensive system of export subsidies where they actively support the outsourcing companies out of their own pockets (tax). It's a system where the Chinese public is paying the state to export goods to the west, and the state elites pocket the profits. Other effects include artificially controlling the value of Yuan in the financial markets to keep the exchange rates favorable for Chinese exports. Then there's the willful ignorance of environmental issues.

Capitalism is to blame about as much as the law of gravity is to be blamed for floods – the market goes where the money is just as water flows downhill.

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2. **tekieneet** says:

[June 4, 2019 at 12:00 pm](#)

Actually it is the US threatening other countries e.g. Canada, Mexico, Iran, Japan, Europe around with their unilateral trade war. They are already starting another tariff with Mexico before the ink on the recent treaty dries.

So far China is the one that is standing up to them.

You might want to learn the facts.

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1. **Jake** says:

[June 4, 2019 at 12:18 pm](#)

If you think this trade war is just starting, you are the one that needs "learn the facts." This war has been going for decades and the middle class of the USA has been on the losing end for nearly that long. Trump offered a level playing field, no tariffs in, no tariffs out, and that offer was met with what amounted a stunned Pikachu meme. It is easy to look at the kid in the class that has new found confidence as a 'bully' but from a different perspective, maybe they are just making things right.

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1. **W** says:

[June 4, 2019 at 8:39 pm](#)

Dude put the koolaid down.

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1. **Jake** says:

[June 5, 2019 at 9:09 am](#)

What koolaid?

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2. **tekkineet** says:

[June 4, 2019 at 2:03 pm](#)

<https://www.cnbc.com/2019/06/04/in-the-us-china-trade-war-here-are-the-economies-that-are-winning.html>

>That tariff fight has resulted in the U.S. and China importing fewer goods from each other, especially products subject to higher levies, said Nomura. In addition to Vietnam, the other major beneficiaries from the trade war are Taiwan, Chile, Malaysia and Argentina, the bank said.

US is not "winning" nor are the middle class winning. They are the one paying for inflation. tariff is paid by the consumers that buys import,

not the originating countries. The 1% owing that out sourced the manufacturing isn't going to be paying for it.

The jobs aren't coming back. At very low unemployment rate, there won't anyone taking new jobs. There might be some immigrants (legal or illegal) that would do it, but US is not doing that.

As to learning about the facts, you need to do some actual research and quote your sources. I did mine.

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1. **CW** says:

[June 4, 2019 at 6:25 pm](#)

Straight from the politburo! I seriously wonder if you understand the USA at all. Unemployment stats are not on your side.

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3. **tekkineet** says:

[June 4, 2019 at 2:12 pm](#)

FYI: <https://www.marketwatch.com/story/trade-wars-cost-us-stock-market-5-trillion-so-far-estimates-deutsche-bank-2019-05-31>

>The U.S. stock market has left \$5 trillion on the table as trade tensions over the past 17 months contributed to an effectively sideways trade, Deutsche Bank estimated on Friday.

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1. **Jake** says:

[June 5, 2019 at 9:24 am](#)

Good.

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4. **CW** says:

[June 4, 2019 at 3:08 pm](#)

We aren't playing games anymore. And to lump Canada and Europe in with a country that has 1 million people in concentration camps is rich

to say the least.

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1. **Miroslav** says:

[June 5, 2019 at 6:58 am](#)

USA? 2.2 million in prison.

https://en.wikipedia.org/wiki/Incarceration_in_the_United_States

I see your point, you want to restore US manufacturing. That is a noble goal.

But for this to be effective, you would need to do 3 things:

1. Tax the rich corporations (no \$0 taxes on Amazon and Apple) and use that money to rebuild the manufacturing
2. Introduce not 10 or 25%, but 200-300% import duties, to protect your manufacturers
3. Stop wasting money on overseas wars. MIC can switch over to healthcare, infrastructure and civilian manufacturing.
4. Profit!

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1. **Ren** says:

[June 5, 2019 at 7:29 am](#)

“MIC”

Military Industrial Complex?

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5. **makomk** says:

[June 5, 2019 at 6:50 am](#)

Actually, that's not true when it comes to using control over the rare earth supply as a weapon. One of the ways China “built out a vast value-add chain for its rare earth” is that, a few years ago, they cut off the supply of rare earth metals to the rest of the world – because they'd driven other sources out of business, non-Chinese manufacturers of things like neodymium magnets couldn't get the raw materials they needed and were driven out of business. Then, once they'd dealt a crippling blow to those manufacturers but before sites like Mountain

Pass could reopen and provide an alternative, they reopened their supplies to the rest of the world and ensured there was no way other suppliers could find enough of a market to survive.

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3. **jake** says:

[June 4, 2019 at 12:27 pm](#)

Many of the author's on this site have a cognitive dissonance issue that is so prevalent in modern western society. They want all sorts of new widgets and tech, and they want it for next to nothing, so they are OK with pollution and human rights abuses (as long as they don't have to be witness to it). They tweet about climate change on their new chocked-full-O-rare-earths PC and text their friends on their FoxCon made iPhones links to 'news' articles on threats to civil rights in the US.

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4. **Steve** says:

[June 5, 2019 at 6:32 pm](#)

Can do without HR abusers? Seriously? What would we do without the USA? They can claim a lot, but certainly not having a clean slate on HR issues, particularly in countries that their military visits.

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7. **Severe Tire Damage** says:

[June 4, 2019 at 8:21 am](#)

Mountain Pass. Shut down by California environmental regulations due to trace amounts of Thorium in mine tailings and/or waste rock. Good to hear it is coming on line again.

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1. **Ostracus** says:

[June 4, 2019 at 1:40 pm](#)

Get those Thorium reactors started.

https://en.wikipedia.org/wiki/Liquid_fluoride_thorium_reactor

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2. **Will Emite** says:

[June 4, 2019 at 5:13 pm](#)

Yes .The US has one of the biggest REE deposits in the world .Kind of bad luck it's not a few miles east in Nevada....

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8. **daveboltman** says:

[June 4, 2019 at 9:05 am](#)

When I buy a new car battery, I have to either return the old one, or pay a lead deposit. The same sounds like a good system for recycling rare-earth metals in hard-drive magnets. Return your old hard-drive when buying a new one (or new laptop containing a hard-drive), or pay a REM deposit. All the magnets I have on my fridge right now would be worth a fortune.

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1. **alfcoder** says:

[June 4, 2019 at 9:45 am](#)

it's a good idea, but maybe the solution would be that we won't need too much of the rare-earth magnets, i mean for the hard-drives, maybe we will have some big ssds and for the e-car industry it is already free from magnets, ok for the wind-turbines there is a real need for the magnets, but to be honest we are far better with nuclear-power than the stupid landscape ruining wind-turbines :)

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1. **Martin** says:

[June 5, 2019 at 1:08 am](#)

For wind turbines the reason for the use of RE magnets is the same as for E-cars: Better efficiency. You can build both without the magnets, but they are better with permanent magnet motors/generators.

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2. **Jan** says:

[June 4, 2019 at 10:04 am](#)

Interesting concept... yet I expect that the solid state drives are taking over BEFORE hard-drive-magnet recycling acts are becoming a fact. But seriously, why magnets, in Europe we are expected to return our old devices to the same store as where we buy the new one. And the store is required to take it in and send it to the recycling center. Though in practice people are not always buying new stuff because old stuff breaks, so there are always the recycling centers where you can bring your old appliances to have them recycled.

The problem is... these recycling centers look like a paradise to any hacker/maker/builder, the most beautiful parts are scattered around ready for disassembly. Yet nobody is allowed to take stuff home! So all the pretty motors, nice cabinets or just cool old stuff is destined for pure destruction (they call it recycling). Dismantling stuff so that "we" (the hackers/the builders/the makers) cannot use it sounds waste full to me. So knowing this make me really feel sad when I need to pay extra just to "enable" the recycling process everytime when I buy something new.

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1. **Ostracus** says:

[June 4, 2019 at 11:05 am](#)

You make it sound like you don't have a Craigslist.

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1. **Martin** says:

[June 5, 2019 at 1:11 am](#)

This is probably some advertisement site, where you can sell used stuff (or give it for free). This is a lot of effort for stuff I just want to get rid off.

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1. **Ren** says:

[June 5, 2019 at 7:33 am](#)

On Craigslist many of the Free items that are posted, are left out on the curb.

The post just notifies interested people that it is available.
I'm not sure, but it is similar to kijii (sp?) in other countries.

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2. **Steve** says:

[June 5, 2019 at 6:33 pm](#)

Let the money for their coffee jar speak!

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9. **iegjaa** says:

[June 4, 2019 at 9:17 am](#)

There is a massive uranium deposit near Haćki city in Polish People's Republic, unfortunately it can't be mined because it's "Nature 2000" zone.

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1. **CKnopp** says:

[June 4, 2019 at 10:03 am](#)

Sounds like a job for The Boring Company. Start the tunnel in unprotected space, get 200 feet down, and tunnel under the surface to mine or pump oil.

Be sure to send them to Anwar when you're done with them.

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10. **tekkieneet** says:

[June 4, 2019 at 11:54 am](#)

At some point, China's own market demand (electrical vehicle, high tech toys) would catch up with their production. The rest of the world is better off securing their own supply.

Mining rare earth is the easy part, but there are all kinds of nasty stuff that comes with the refining process. e.g. amount of waste, toxic chemical, radio active element such as Thorium. All of that waste have to go somewhere.

China claimed that they have cracked the secret of extraction of Lithium at about 1/5 current price. Magnesium and lithium have a lot of similar chemistry, so it is difficult to separate them. They also claimed much faster and safer new

rare earth extraction with a new process. The timing is a bit coincidental as they were in the last few weeks. If it is true, it will put them in a much more advantage position against new competitions or any future export tariff.

BTW: <https://www.reuters.com/article/us-lynas-corp-malaysia/malaysia-government-pleased-with-rare-earths-firm-lynas-plans-to-move-initial-ore-processing-ceo-idUSKCN1SU0WY>

Malaysia government wasn't happy with them stuck with the toxic waste refining rare earth ores for the Australian by not renewing the operation license. The mining company is shifting back the cracking and leaching back to Australia.

(Wonder if they would ship all the previous waste to Australia too. :P)

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1. **Martin** says:

[June 5, 2019 at 1:16 am](#)

I don't see, how lithium should be similar to magnesium. For example Mg is similar to Ca in aqueous solution and it's carbonate has low solubility. While LiCO_3 has a much higher solubility. I don't know, if this is the best process to separate the two, or even if it is industrially viable. But it shows different properties of the two.

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11. **Kiril Mugerma** says:

[June 4, 2019 at 1:41 pm](#)

Best parts of the article: Reuse and Recycle. China has been recycling rare earths for a decade now. Starting mines is expensive and useless if you are sending the concentrate to China for refining there. No recycling outside of China either. We at Geomega GMA.V have spent the last 5 years developing the technology to refine and process REE in a clean way. Finally starting first recycling plant focusing on permanent magnets in 2020. Need to bring the secondary transformation of REE if we ever want to bring the mines back.

(Disclosure: I'm CEO of GMA.V)

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12. **Curtis Jones** says:

[June 4, 2019 at 4:15 pm](#)

Dan Maloney has written a very nice piece. There are some good comments, too. This is, in some ways an old story. Victoria Bruce's "Sellout" tells how U.S. companies sold off rare-earth technology and of efforts to get U.S. companies back into the rare-earth business.

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13. **theRainHarvester on YouTube** says:

[June 4, 2019 at 5:08 pm](#)

Can we "deposit bottle" buy back old batteries and magnets from people so USA can make our own?

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1. **Kiril Mugerma** says:

[June 4, 2019 at 5:59 pm](#)

Yes, that's exactly what's our company is doing, recycling magnets. That's the way to go.

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1. **theRainHarvester on YouTube** says:

[June 6, 2019 at 10:56 am](#)

Awesome! I clicked your name and read the website. I wish you well!
Are REEs being stockpiled in USA currently by anyone?
Is anyone else in USA already recycling them?

It seems like a winning scenario to recycle REEs. China can't just raise the price on magnets or lithium batteries without hurting their exports. And, we can recycle those cheap sources for ourselves.

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1. **Kiril Mugerma** says:

[June 6, 2019 at 6:14 pm](#)

The US government is stockpiling REE. Different amounts of each of the 15 elements.

No official commercial recycling of REE is available anywhere in the world outside of China. A few collectors exist in various places and

all the material will now be flowing to our facility in Canada. We will gradually start going after the Ewaste too. It's a shame that Ewaste recyclers lose so much REE. They just take the precious metals and the REE just go down the drain as metal scrap.

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