

“A U.S.-EU Strategy to Close the Critical Minerals Circularity Loop”

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The United States and our allies do not have the capability to produce and refine nearly enough critical minerals to meet the demand for semiconductors, medical devices, and energy storage let alone maintain our military’s technological edge and successfully achieve a clean energy transition. Our modern lifestyle cannot function without critical minerals and the demand for critical minerals is expected to increase 6-fold by 2050. The challenge this presents to our national and economic security is pressing and solutions are not immediate. However, circularity can strengthen the sustainability and resilience of our critical minerals supply chains. A circular economy is not only recycling: it also is about reducing waste, pulling critical minerals from waste, prolonging the life of materials, designing products for materials to be cycled back into the economy, and using advanced digital technology and manufacturing.

Recommendations

- 1.) **The US should model their circularity legislation similar to the EU Battery Directive because this legislation supports recycling.** Although the U.S. has the Inflation Reduction Act with strong government funding, it is still difficult to onshore, but more subsidies and support would help on the funding side to close the gaps. Local government levels should incentive recycling unused household tech items.
- 2.) **The EU and the US need a framework on how we define and use waste.** This may be done through the Harmonized Tariff System, where we can disaggregate waste from battery EV components or lithium, nickel, and cobalt. Once we have a system to classify waste, then the U.S. and the EU can figure out how they can source waste from each other.
- 3.) **Develop trade policy tools that protect the U.S. and allied nations’ borders, such as developing a “clean corridor” trade agreement or recommending multinational “agreements” to incentivize and penalize sourcing from certain countries.** Some options discussed were local to local production for battery facilities, and partnerships to mine lithium in Canada (who is both a US and EU ally).
- 4.) **Develop and adopt a common set of binding environmental, human rights, and labor standards in any potential EU-US critical minerals agreement or other initiative, specifically geared towards the extracting and processing side of the critical minerals supply chains.** This should be a race to the top, and only a coordinated US-EU approach will ensure that extraction and processing can integrate strong human rights, labor, and environmental standards at global level.
- 5.) **U.S.-EU partnerships with industry and public sectors with pilot programs that offer a full value approach.** Some of these public-private sector partnerships should look at secondary life applications, prolonging the use of products, cost-effective ways to recycle, and changing battery compositions. Both the EU and US need more innovation that allows for simple cost-effective ways to recycle and expand our access to the critical minerals, possibly through EU-US university collaborations. China is innovating electric vehicles for easier recycling, where they are putting in a battery and selling it.
- 6.) **Recommend the U.S. promote circularity domestically.** Europe is ahead of the U.S. on their recycling waste targets but the U.S. still has far to go. Currently there are a lot of waste streams, especially for

germanium and gallium which are sitting in products. Although we have U.S. funding through the IRA for EV inputs, additional funding could be helpful for other critical minerals like gallium.

- 7.) **Develop best practices and pilot programs for developing countries to promote circularity.** Look to EU-US Article 11 Agreement or the Basel Convention to draft this approach.
 - a. Examples: Rio Tinto's and Glencore's critical minerals recovery programs. Require full-value mining or nose to tailing mining, i.e. extracting valuable minerals from waste.
 - b. Incorporate advanced technology and manufacturing in government support and incentive programs, such as digital twin technology, 3-D printing, and other advanced manufacturing and processing techniques.

- 8.) **Buyers need confidence that recycled critical minerals are just as good as buying new.** The problem with recycled content is that there is a very small market for buyers. It takes a lot of money to get recycled content out of a product, and most often it is cheaper to just buy a new critical mineral input cheaply from sources such as China. It is therefore critical to incentivize demand for recycled materials on top of promoting science-based evidence that recycled critical minerals are as good as new ones (e.g., by setting a certain percentage of recycled in specific public procurement).

- 9.) **Encourage OEMs to develop partnerships directly at and with the local source.**