National Security Trumps Globalization & Free Trade in the Critical Minerals Race

written by Jack Lifton | February 17, 2023

Do national security trump globalization and free trade? Apparently so. The **CMI Table of Comparative Critical Minerals' Lists** below tells the story. But, first, some background.

The surface and near-surface distribution and accumulation of the minerals, from which modern mechanical and chemical engineering extract useful chemical elements, is a result of billions of years of the geological evolution of the earth's crust. Most recently some mineral deposits (accessible and economically workable concentrations) have also been created by volcanic activity and "weathering," the breakdown and sometimes dissolution of minerals by the periodic freezing and heating, we call the seasons and by thousands, perhaps millions, of centuries of rain.

The only effect that humans have had upon the distribution of the minerals containing the metallic chemical elements is to have removed them to places of human habitation as technologies became available to recover them, extract the desired chemical elements from them, and process the chemicals thus obtained into metals deemed necessary for survival.

Metals, the first known of which either copper or gold, which can both be found in "native" (metallic) forms, and then, after that, probably tin and iron were "discovered" some 6 to 8 thousand years ago. The ancient world knew less than 10 metals and just a very few alloys of them (bronze, brass, electrum, tin, iron, mercury). All of the rest of them were "discovered"

only in the last 250 years.

The “Birth” of Technology Metals

In fact, it is only during and after World War II that a new class of metals, which I have called the “technology metals” were prepared in commercial quantities and have now enabled the age of miniaturized solid-state electronics, alternate energy storage, and nuclear generation of electricity to flourish and transform our society.

Those minerals, which were critical up to World War II were pretty much the same ones that the Romans and the British needed to establish and maintain their empires: iron and copper.

There is a disconnect between the identification of the metals they deem to require sourcing critical minerals by individual nations and national groupings, and why they are in particular, critical.

Comparative List of Countries’ “Critical Minerals”

There are different emphases and priorities used by different nations in choosing critical minerals. But, it seems that all such selection agendas have one overriding theme, national self-interest. Most of the world’s nations consider the most critical minerals to be those that support their domestic economy first and their export economy second. For the two current “great economic powers”, the USA and China, we have so far only the USGS list, which is contained in the **CMI Table of Comparative Critical Minerals’ Lists** below. I have not seen a comparable list for the PRC.

In any case, the American USGS list is an “official” compilation that includes the needs of the world’s largest military, that of the United States. And, quite frankly, although it is the US military’s needs that get the most media coverage, that usage is just a fraction of the critical minerals contained in products for the American consumer economy. For example, I estimate that although the military may use 20% of all of the rare earths consumed annually in the USA, by far the biggest user of them is the OEM transportation (cars, trucks, passenger planes, railroad rolling stock, and civilian ships and boats, etc.) industry followed by the manufacturers of industrial motors and civilian appliances and infotainment devices.

In the table below, the elements in the solid blue lines are those that all of the shown national or regional (EU) critical minerals list agree upon. Those in the lighter blue background are chosen by some but not all of the nations/groups, and those with no background represent the choice of individual nations alone.

The perspective of most of the lists is either (almost) all-encompassing or ridiculously narrow.

The key metal of our age of technology, copper, does not appear on anyone’s list!

The structural metals for both the peacetime and war economies, iron, aluminum, and copper do not appear at all!

China is Winning the “Critical Minerals” War

More than 50% of the production of end-user forms of all of these metals (copper, iron, and aluminum) are today produced in China, for which we have not yet found a critical minerals list,

but I suggest that we simply look at the relative proportions of any metal today processed and produced in China to reason out the Chinese critical minerals' list. In fact, China has a monopoly on all of the critical war minerals and metals processing.

This is the result of the first successful industrial policy in history.

Talking doesn't produce structural or technology minerals and metals. Only action does.

Critical Minerals INSTITUTE

Critical Minerals List

USA	CANADA	AUSTRALIA	UK	EUROPE
2022	2021	2022	2022	2020
Aluminum	Aluminum	High purity Alumina		
Antimony	Antimony	Antimony	Antimony	Antimony
Arsenic				
Barite				Barite
				Bauxite
Beryllium		Beryllium		Beryllium
Bismuth	Bismuth	Bismuth	Bismuth	Bismuth
				Borate
Cesium	Cesium			
Chromium	Chromium	Chromium		
Cobalt	Cobalt	Cobalt	Cobalt	Cobalt
				Coking coal
	Copper			
Fluorspar	Fluorspar			Fluorspar
Gallium	Gallium	Gallium	Gallium	Gallium
Germanium	Germanium	Germanium		Germanium
Graphite	Graphite	Graphite	Graphite	Graphite (natural)
Hafnium		Hafnium		Hafnium
	Helium	Helium		
Indium	Indium	Indium	Indium	Indium
Iridium				
Lithium	Lithium	Lithium	Lithium	Lithium
Magnesium	Magnesium	Magnesium	Magnesium	Magnesium
Manganese	Manganese	Manganese		
	Molybdenum			
Nickel	Nickel			
Niobium	Niobium	Niobium	Niobium	Niobium
Platinum group metals	Platinum group metals	Platinum group metals	Platinum group metals	Platinum group metals
				Phosphate rock
				Phosphorous
	Potash			
Rare earth elements	Rare earth elements	Rare earth elements	Rare earth elements	Rare earth elements
		Rhenium		
Rubidium				
				Rubber (Natural)
Scandium	Scandium	Scandium		Scandium
		Silicon	Silicon	Silicon metal
				Strontium
Tantalum	Tantalum	Tantalum	Tantalum	Tantalum
Tellurium	Tellurium		Tellurium	
Tin	Tin		Tin	
Titanium	Titanium	Titanium		Titanium
Tungsten	Tungsten	Tungsten	Tungsten	Tungsten
	Uranium			
Vanadium	Vanadium	Vanadium	Vanadium	Vanadium
Zinc	Zinc			
Zirconium		Zirconium		

Source:

https://criticalmineralsinstitute.com/wp-content/uploads/2023/01/Critical_Minerals_List.pdf