

# The glaring problem of Resource Base Load for manufacturing infrastructure: The Case for Rare Earths and Oil.

✘ Financialization's need for instant gratification has completely disrupted the Western infrastructure of natural resources; the goal of the natural resources production industry must be and can only be the supply to its downstream supply chains of the goods necessary to produce the end-user forms from which the manufacturing and distribution industries can supply to the consumer those fuels and devices that make our lives safe, healthy, comfortable, and secure (militarily). This is clearly a national goal to be accomplished nation by nation with each first and foremost acting in its own interest. By focusing on resource start-ups (e.g., junior mining ventures) and ignoring or not understanding the part that these play in the actual economy banks and institutional investors have made money by churning shares and mining the street but in doing so have actually prohibited the market from reaching supply chain equilibrium with demand.

Resource equilibrium is now being restored in nations that have total supply chains, such as China with its rare earths. It cannot be restored where total supply chains do not exist. It is therefore urgent that capital be deployed to restore equilibrium flexibility before the shift to national dominance in natural resources becomes permanent. The Saudis and Russians and now the Iranians see this situation in oil and are trying to stave off the creation of a self-sufficient total supply chain in the world's largest oil customer's, the USA and China. In the rare earth "space" China has

successfully managed to hold on to and increase its near monopoly in the production of rare earths by increasing its dominant monopsony in their processing to end-use forms. The principal driver for this has been the “Capitalism with Chinese Characteristics” practiced in China today. The main characteristic has been the goal of China first.

In times of economic stress, such as the last decade, we keep hearing from politicians that we can help our economy by spending on infrastructure. But to politicians and laymen “infrastructure” has a narrow mechanical meaning. It is defined as roads, bridges, traffic signals, street lights, dams, overhead electrical transmission lines and other “things” that voters can see and touch and the maintenance of all of which is clearly necessary, even to politicians, for our safety, health, and well-being. Infrastructure maintenance should be continuous and ongoing, as it is in any well managed privately owned and operated manufacturing plant, but our body politic has a kind of distaste for the term “maintenance” and this is reflected in the low regard displayed by individuals, journalists, and the entertainment industry towards those who work in maintenance.

In fact it is irrefutable that a sewage plant maintenance worker is far more important to our own and our society’s health than any hedge fund billionaire, and that a skilled bus or train “driver’s” competence, or that of an aircraft maintenance mechanic, is critical to our safety whereas a movie star’s opinion of a consumer vehicle’s safety is essentially worthless.

As capital for new mining ventures has now vanished from the scene concomitantly with any foreseeable near term net increase in demand for metals and materials a glaring infrastructure deficiency has become apparent. In order to maintain even the least necessary (for replacement) output levels of our domestic manufacturing industry we need to have unencumbered access to

1. A “secure **base load** of natural resources from mining;
2. a secure (domestic!) **supply chain** for each material; **and**
3. a capacity sufficient **recycling** industry to secure base load maintenance in both common and critical materials.

But what do I mean by “base load?” I mean the minimum amount of a natural resource and a capable supply chain to process and fabricate the end user forms for that amount of the resource to ensure that manufactured goods and fuels can be replaced as they are “used up.” For consumer goods this means that necessary newly manufactured goods are able to be manufactured to replace worn out and failed existing ones. For fuels it means that there is a secure supply of fuels where needed and that supply is sufficient to maintain and distribute the least necessary amount of energy to insure our health, safety, and security (defense). These requirements are interdependent. For example, in order to keep high sulfur crude flowing from Alaska it is necessary to have molybdenum alloys of steel for pipes; fittings, and storage so that the oil can be kept flowing for the longest periods between “maintenance cycles.” BPs failure to police its supply chain in a timely manner for such piping was the major cause of its \$500,000,000 “accident” just a few years ago.

In every case if we further define the base load of a natural resource to be an amount necessary to establish domestic self-sufficiency in that resource in any particular country then we can immediately measure the size of the problems that will arise if and when global trading is interrupted or ends due to war or political realignments.

Here’s a vivid recent example: The rare earth base load for China is 80%+ of global production, because that is the percentage of rare earths that are processed into end-user ready forms in China. Since China produces at least 95% of all of the rare earths it is in no danger of a manufacturing breakdown due to base load deficiency. The USA, which requires 10% of the world’s rare earth production to maintain

its demand for rare earth enabled products would be unable to meet its rare earth baseload demand in the case of ANY interruption of rare earth enabled end-use components and finished assemblies. These two groups include ALL of the motor vehicles, motorized appliances, personal entertainment devices with magnets, information management devices, and any military hardware dependent on such devices. But we know that, and we have decided that globalization and the power of magic alphabetical incantations such as WTO and TPP will protect us from base load failure. Our political and industrial leaders assure us that base load maintenance of rare earths is unnecessary in our globalized alphabetized world.

A complete lack of industrial experience infuses the rare earth commentariat.

I was recently in Japan the only nation other than China with the capability to have a total rare earth supply chain. Japan's government has backstopped its industrialists in their quest for achieving a Japanese base load in rare earths. Large Japanese investments have been made in Viet Nam, India, and South America in the development of high capacity resources of all of the rare earths. The Japanese government has a program to develop techniques to mine the ocean bottom's crusts and sediments where rare earth grades of 2000-3000 ppm have been discovered (These are 10 times the concentration of the ionic absorption clays), and Japanese recycling of rare earth permanent magnet and battery scrap is a large business and already has a global reach. The purpose of all of these programs is to secure self-sufficiency for Japan in its domestic rare earth industry.

A Japanese expert in rare earths' trading who I spoke with was amused at the "illegal mining" story that he said pervades the pundit-sphere. He pointed out that the end use forms of the rare earths have defined specifications that cannot be met by materials not processed and provided by approved vendors whose products have undergone PPAP, production part approval

process, validation by the ultimate manufacturing or assembly customer. ISO certification also requires that the provenance of parts and raw materials be completely defined. Therefore, Global1000 buyers of rare earth enabled components know exactly where they come from and how, where, and by-whom they have been processed, and today that is China's Big Six. This is one basic reason that China restructured its rare earths industries. Illegal mining is purely and simply overproduction and the Big Six knows exactly when and where any of it is occurring.

This occurs because overproduction is a common affliction of industries trying to weather economic storms. We see it in oil today and we see it in the rare earths' industries. Just as with oil this causes prices to drop, and just as with oil rare earths prices have dropped. An affliction of state capitalism is the tendency to value total production over total sales. This killed the Soviet Union's metals' industries, and the Chinese recognizing that fact are trying desperately to avoid that fate. They are nursing their natural resources industries with treatments that they know could kill them. I expect the patients to rally and decline as the experimental treatments continue. But in the end I expect that China will restore its rare earth base load equilibrium as well as that of its steel, copper, and their companion metals' (Technology Metals') industries.

I also expect Japan to restore its base load rare earth equilibrium.

For the USA and for Europe it will be first necessary to adopt the goal of restoring rare earth base load equilibrium. This is our greatest challenge.

The best hope for America is matching right sized mining and recycling to the base load.