



# THE BANQUE BLOG POST

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## THE CRUCIAL ISSUE OF RARE METALS

In May 2019 when Donald Trump prohibited Huawei access to the American market, the Chinese President Xi Jinping made a trip to a rare earth metals plant to make it clear that in the event of an escalation of trade tensions, China could block the export of these precious minerals to its rival. Western countries have become extremely dependent on these new kind of raw materials which China is by far the world's largest producer and for them, this reality has become a paramount strategic question.

Wind and sun alone cannot fulfil the energy transition and «green capitalism», wind turbines, solar panels and batteries need these rare metals - just like our high technology, our servers and our smartphones. This shift from an economy based on fossil resources to renewable energies consumes high doses of these materials, which are in the process of profoundly modifying geopolitics and economic circuits.

According to the US Geological Survey, of the 170,000 tonnes produced in 2018, 70.6% (120,000 tonnes) were produced by China, the other producers - Australia (20,000 tonnes) and the United States (15,000 tonnes) - are far behind.

But in China, almost nothing has been done to respect the most basic ecological and sanitary standards. Refining requires grinding the metal and using a host of chemical reagents such as sulphuric and nitric acids. Each tonne of rare earth requires 200 cubic metres of water which as part of the process, will take up acids and heavy metals...

The ecological damage is massive. It is estimated that 10% of Chinese arable land is contaminated with heavy metals and that 80% of well water is unfit for consumption.

Rare earths include metals with obscure names (baryte, beryllium, gallium, niobium, palladium, iridium ...) which have unique properties, in particular magnetic (batteries, miniaturisation of high-performance magnets, wind turbines, smartphones, integrated circuits) , but also optical (lasers, colour television, medical radiography), chemical (petroleum cracking, catalytic converters) or mechanical (their hardness facilitates the polishing of glass in advanced optics).

With the development of NICTs (New Information and Communication Technologies) since the 1970s, humanity now exploits almost all 86 metals found in Mendeleev's periodic table. An electric car incorporates around 20, a smartphone about 5 and the majority cannot be substituted.

Due to the environmental consequences of mining and refining, most mines in developed countries have been closed, and China has taken over the baton.



Here is the hidden side of our green technologies, which are “clean” from our point of view but not necessarily when the entire value chain is considered. An electric vehicle does not emit CO<sub>2</sub>, but it consumes significantly more energy during its manufacture than a classic car because of its battery - and in the end, the results are not very advantageous. By integrating its environmental cost, its pervasiveness seems unrealistic.

Our “energy transition” is full of contradictions: so-called “clean” energies require the use of rare ores whose exploitation is very polluting. Renewable energies (wind, solar) exist thanks to materials which are not. “Low-carbon” means of transport generate a lot of CO<sub>2</sub> during their production ...

In the United States, three-quarters of magnet producers have disappeared. Guillaume Pitron explains: “By betting on renewable energies, Beijing hastened the abolition of an industrial program based on fossil resources and in which the West excelled, in favour of a new energy system where the latter is already accumulating delays. (The war of rare metals, The Links which Liberate, 2019, p. 197).

In any event, rare metals have become vital to our economies and the United States - which dominated production between 1965 and 1985 - has given way to China. These are the facts of the problem. The Middle Kingdom has perfectly understood the issue: «Rare earths are to China what oil is to the Middle East», confirms Deng Xiaoping, the founding father of economic power. Any means are employed, including dumping to stifle competitors, or supply disruptions to force processors to settle in the country.

China is not satisfied with extraction alone but it aims to go up the chain and is succeeding. It already manufactures four out of five batteries in the world. Knowing that 40% of the added value of an electric car resides in its battery, we can imagine the transfer of value taking place before our eyes. The same can be said in the field of super magnets that equip the F-35 - the stealth plane of the US Air Force - despite the scandal that this caused at the Pentagon and in Congress.

Wind turbines consume far more raw materials than previous technologies, conventional power plants: with equivalent electricity production capacity, they require 15 times more concrete, 90 times more aluminium, 50 times more iron and copper, and lots of rare metals.

This “high-tech Colbertism” threatens the western countries with a new wave of deindustrialization which, following the high workforce (textiles) sectors, would this time affect high technology sectors. It becomes a question of sovereignty and economic survival.

We must abandon the magical thought of «factory-less enterprises», thereby believing to reserve most of the added value - it does not work. Awareness begins to take hold in the United States and in Europe, especially as the risk of scarcity appears as the consumption of rare earths increases in the world and in this case China would of course ensure its own requests were satisfied first.

In this context, France has its card to play - it is «a dormant mining giant» as Guillaume Pitron explains. Its subsoil contains several minerals (antimony, barite, fluorite, molybdenum, tungsten, etc.) and much more within the ocean floor since the French maritime area is second in the world behind the United States. It covers 11 million square kilometres or twenty times the area of France. Skills exist, experience too. In the 1980s, the Rhône-Poulenc factory in La Rochelle purified eight to ten thousand tonnes of rare earths per year, half the world market! Developing this potential would not only enhance our technological sovereignty and create skilled jobs, but also promote an environmentally friendly mining and industrial model, rather than relying mainly on China...