

INTERVIEW / GIOVANNI BRUSSATO

2035: Europe in electric cars, and dependent on China

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The European Union has taken yet another important step towards an eco-friendly transition. The maximalist programme is moving from theory to action: the European Parliament voted by 340 votes in favour, 279 against, and 21 abstentions to ban newly

registered vehicles with internal combustion engines (petrol or diesel) from 2035. This does not mean that those who do not have an electric car have to get rid of their cars by 2035. It simply means that from 2035, no more cars will be produced that are not electric.

There has been much discussion about the economic aspects of this transport revolution, imposed from above. Above all, there are fears about the effects on employment due to the abrupt transformation of the automotive industry. But it is also necessary to understand the material aspects, in the literal sense of the word. Are there sufficient raw materials to completely transform the vehicle market? And where are they to be found? The Daily Compass discussed the problem with mining engineer, Giovanni Brussato.

Mr Brussato, by 2035, if there are no second thoughts, only electric cars will be produced. How will this impact the automotive industry?

One technical aspect must be clarified: the heart of the electric car is the battery, but we must not forget the electric motor and the permanent magnets that are needed to run it. Both of these elements are mainly produced by China. We want to replace an industrial system that has been built up over the last century and a half with a completely different new system, within a few years. And we have to do this by chasing those who have been pursuing this technological development for decades. It is inevitable that this will be not only an industrial change, but also a cultural one, which we are completely unprepared for. Also from the point of view of structure: manufacturing electric cars requires less manpower..

Do we have the necessary raw materials?

No, absolutely not, not in Europe. It puts us all in a position of dependence on China for the supply of raw materials. And no matter how many fine keynote speeches are given, nothing is being done to make us independent, neither in Europe nor in the US. The problem is that, by choice, we do not want to search for and extract raw materials. Even in the United States, the policy of the Biden administration is unclear on this issue: on the one hand it is in favour of independence, on the other hand it sets up boundaries to ensure that this does not happen. In the European Union, von der Leyen a few years ago let Commissioner Maroš Šefčovič announce his intention to open new mines, but in her last speech on the Union she stated that we will import raw materials from trading partners who share our principles. This is already a very nuanced assumption.

China has a near-monopoly on rare-earth elements. What does this mean for us?

Rare-earth elements are 17 elements that are indispensable components for developing digital and green technology. Then there are the transition metals, such as cobalt, lithium, copper and nickel. China, in recent decades, by acquiring mines or making partnership agreements to exploit the entire production, or by buying shares, has established control over production, prices, and quantities that is beyond our reach at the moment. And it is also difficult to see what avenues might be available to possibly undermine this control. In concrete terms, only the Biden administration is doing anything, intervening in the diatribe between China and Congo over the management of cobalt mining, prices, and dividends to be given to the Congolese government. Otherwise, China is conducting a policy that is very difficult to counter. Physically, finding the raw material is not a problem; if anything, the refining process is difficult. Because at this point components such as thorium and uranium come into play that pose problems of environmental acceptance. We have long since chosen to buy what we need abroad: out of sight, out of mind.

But are electric cars really more sustainable?

Today, the carbon footprint of a battery is unknown. There is no official figure. Catl itself, the world's largest (Chinese) producer of car batteries, has calculated the carbon footprint of its factories, but not of the sourcing of raw materials. The real risk is that, in a few years, the chemical components of the batteries will have to be changed. Catl will also produce sodium ion batteries from next year because it is a cost issue. Today, the competition between batteries is in terms of their range: which one goes further, which one lasts longer. But people still don't realise that this is a race against the planet: the metals from which they are made are limited, they have a devastating environmental and social cost: nickel and cobalt mining are physical assaults on large ecosystems.

And what about economic sustainability?

Prices, which so far have been falling, are now rising again, because if you tell the markets that you will need those raw materials, prices will rise indicating their future rarity. The solution will be to move towards materials that are less rare and whose extraction will require less impact on the environment. However, we are talking about a small part of the planet: North America and Europe. The others are in fact producing for us. But if this technology were to be truly distributed worldwide in the future, the problem will arise: it is one thing to extract nickel for 100 million batteries, quite another if you have to produce a billion and a half of them. This applies to most raw materials. This is why we are thinking of substituting key materials, as is already being done with lithium being replaced by sodium, which is easier to replicate. A personal idea of mine would be to be able to disconnect the batteries from the electric car, making them, like

petrol, refuellable wherever you want.

And as for refuelling, will there ever be enough charging points to charge the electric cars on the road?

A normal charging point needs between 7 and 20 kg of copper. Then the network needs to be expanded, because electricity has to be brought to the charging points. And it is planned to supply them with an energy mix based on renewable sources (otherwise increasing electricity production with fossil fuels is the completely wrong strategy). Let's start with copper: global consumption is expected to enter a crisis within the next ten years. It will not only be a supply crisis, but also a sustainability crisis. An inhabitant of an industrialised country consumes, on average, 10 kg of copper per year, in India less than 1 kg. When India electrifies, that consumption will increase tenfold. The problem goes far beyond our charging points. In a few years, copper will become as expensive as gold. It will also change our habits: it takes an experienced thief to steal gold, but stealing copper is much easier. We are not thinking about how to solve these problems. In fact, the cost of the infrastructure to be put in place will be massive and someone will have to pay for it. Either it will be spread over the community or it will be passed on to the owners of electric cars. And it is in any case unthinkable that there will be as many charging points as there are currently petrol pumps.