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As part of the Euro-China Green & Smart City Awards which rewards European and Chinese cities for their achievements in urban sustainability organized since 2015, the Fondation Prospective et Innovation conducted a serie of interviews about mobility in Smart Cities.

FPI : As an important producer of battery systems for electric vehicles, how do you perceive the transition towards a definite electric system around the world ?

CG : After years – actually, a decade of postponement – European political and industrial decision makers, are moving towards electrification. They realized that the massive move of the Chinese industry towards electric energy will let us way behind. But also, they are realizing the environmental and economic advantages of such technology. Today, all vehicle manufacturers invest massively in the electrification of their ranges and most of their R&D resources are focused on making it possible. Hence, over the next 10 to 20 years, the largest portion of the market will irreversibly become electric. Hybridization with hydrogen and batteries may only really starts within 10 years, but in any case the times of ICE are over.

This being said, the fastest, most obvious, and best shift financially speaking and in terms of infrastructure will be for public transport. Routes are predictable,

infrastructure can easily be installed in depots and all environmental and financial indicators are already green. The same will happen for urban and suburban logistics. Due to the cost of oversized batteries for almost pure urban use and to the lack of charging network, it will take more time in some areas for the passenger vehicles, although technically and comfort-wise, it will become a preferred choice in cities.

FPI : USA and China have an important advantage in the future of the automotive market, do you believe that Europeans can compete ?

CG : While sermonizing about environmental issues and consciousness, little was done, while China acted. In France for instance, the “Grenelle de l’Environnement” in 2008 was some kind of a bubble without effects. Overall, Europeans have not demonstrated their ability to transform theories into acts. We only reached a

tipping point after the dieselgate was revealed to the public 5 years ago; and even then it took 4 more years to agree on a strategy that is leading to a very late construction of a European battery industry.

However, Europe has talents, technology, resources and the largest single market in the world besides China. Considering that EU countries will finally manage to agree on a common goal, it is still time to find a place in the market. The fight will be all the more difficult because China, Korea or Japan have built up technologies, experience, economies of scale and have over 90% of market share. But all these markets are new, and not yet mature. Combustion engines have dominated the market for a century but today's leaders did not all appear in the earliest stage. This will be true in an electric era as well, although events are accelerating, and new technologies will emerge. The battle starts, but Europe must enter the game with effectiveness and determination.

FPI : The price of battery lithium-ion is said to have gone down of about 87% in ten years (Bloomberg New Energy Finance) however the price of electric vehicles has gone up. Do you think such numbers are accurate and will it make the electronic cars more affordable for people on the long term? Do you think that lithium-ion is a sustainable commodity?

CG : The predictions of today are the costs of tomorrow. All savings, efficiency improvements and increase in energy density are not effective in the vehicles

you buy and pay today. Costs will further decrease, by maybe a factor of 2. Also, in today's price you contribute to the massive R&D efforts and manufacturing investments which create a significant cost burden. Once this phase is behind us, within the next 10 years, prices will further decrease and be aligned with combustion engines, not to mention that electricity and maintenance will be cheaper than now with current combustion engines. This is already the case in public transport – such as for electric busses – as they are fully used daily and therefore they are already the cheapest option in term of total cost of ownership. Private cars are not totally there yet because they are largely underutilized, but when they enter into sharing schemes, which will probably become more common in the future, it will not only become affordable but actually much cheaper.

As far as lithium is concerned, we are well aware that it is a commodity and as for any commodity we must carefully watch the sustainability of the resource. However, we must say that it is hard to believe that it can become an issue given that it is amongst the most commonly available elements used in a very small quantity (it only represents a fraction of the materials used in the so-called lithium-ion cell). Furthermore, chemicals in batteries do evolve over time and even change. It may well be other elements, like sodium for example, that will be used inside the batteries in some decades. Not to mention that the efficiency of recycling is getting very high, at levels up to 90%.