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## Editorial

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The 2023 Gerpisa international colloquium focused on the process of electrification of the global automotive industry. From 4% in 2020, the share of plug-in vehicles has grown to 16% in 2023, and up to 37% in China and 22% in Europe. This growth has been essentially driven by environmental regulations and industrial policies, rather than by consumers' preferences. But how sustainable is this accelerated transition towards electric vehicles?

How sustainable is it for the workers of the automotive sector, where massive restructuring will take place with the accelerated phasing out of internal combustion engine vehicles? For the core Western automotive countries that see their hegemonic position in the global automotive value chains contested by the growing influence of China on electric vehicles value chains and raw materials? For peripheral and semi-peripheral countries that so far appear excluded from this transition and relegated to the legacy production of ICEVs, the low-cost assembly of EV batteries for Western markets, and/or the extraction of the raw materials required for their production? For the

traditional automotive players, which have to design their products around more costly EV powertrains, while facing increasing pressure from new players in EVs production, battery production and digital mobility services? For consumers and car users, who see the cost of acquiring and using a car rapidly increasing, to the point that many of them could be excluded from a personal mobility mode based on electrified vehicles? For carbon neutrality as the main reason for this transition, since EVs require very significant amounts of energy to be produced and used, and the recent energy crisis highlights how much energy production still relies on fossil sources even in places like Europe where investments in renewable energies have been important? And, finally, for electrification itself, as this accelerated transition requires huge quantities of relatively rare raw materials, whose availability at reasonable costs to keep electrification going is not guaranteed in the years to come?

At the same time, all these and many other questions and concerns that have been raised by different stake-holders, experts, government agencies and lobbies have started to be addressed by a whole series of new tentative ‘answers’: new industrial policies to support the transition, to regionalise electric vehicles value chains, to protect automotive workers and create new jobs; new political concepts, such as the notion of ‘just transition’ promoted by trade unions to support workers and communities threatened by electrification; new regulations to guarantee the social and environmental sustainability of the EVs value chains via CO<sub>2</sub> footprints and due diligence norms and standards; circular economy business models and regulations to reduce waste and fight planned obsolescence; new battery technologies to reduce the reliance on rare and expensive materials, increase energy density, and further reduce cost per kWh; new dedicated EV platforms to optimise the production of electric vehicles and reduce production costs; new manufacturing technologies (I4.0, digitalisation) to reduce the production costs of both vehicles and batteries; and new business models based on service rather than ownership – mobility and/or battery as a service, autonomous vehicles – to reduce the number of vehicles and batteries needed for the mobility of persons and goods as well as its costs.

The selection of papers in this special number reflects both the wide scope and the complexity of this paradigmatic transition towards electro-mobility, as well as the wealth of the scientific production within the Gerpisa international network of research. If the five contributions presented here do not, of course, cover all the questions and issues raised above, they do however address several of them and they do so, even more remarkably, across all the value chain.

The Chuanjuan Wu and Hua Wang’s article on ‘Mechanism of value co-creation in new product development – the case of China’s electric vehicle industry’, delves into a crucial question raised by the current transition towards electro-mobility: how Chinese companies have been able to leapfrog Western competitors and become leaders in the EV sector, both in the production of batteries and new energy vehicles, and in the development of new services such as battery and mobility as a service?

The article shows that a new approach to product development based on the co-creation of both products and value between different actors along the value chain has played a key role in this process, reducing transaction costs and the inherent risks of innovating in disruptive technologies while also contributing to the rapid growth of the whole Chinese EV eco-system. Based on four different case studies of value co-creation between OEMs and suppliers in batteries and components production as well as service

related development, the article highlights the importance of institutional and organisational innovations linked with equity joint venture as a key enabling factor of this fast transition.

The successful development of the NEV sector in China reminds us that electrification does not necessarily imply restructuring and job destruction. Yet, in places like the US and Europe, the need to phase out huge ICE industries in short periods of time casts a long shadow on the employment prospects of the transition.

Anna Novaresio's article 'The greening of the European automobile industry and its labour effects: an empirical and regional analysis', which received the special mention of the 2023 Gerpisa Young Author Prize, plays down these concerns by showing that, at least until 2018, electrification had a rather positive impact on the employment of European automotive suppliers, and on the labour productivity of OEMs. While it remains to be seen what happens when electrification accelerates in the post-COVID configuration, following in particular the 'Fit for 55' update of the European CO<sub>2</sub> regulation, the article provides solid empirical evidences to support a positive view of the transition even from the perspective of its labour impact. The main argument put forward is that what will probably matter the most in the end, it is how the transition is approached: if it is feared and delayed, opportunities will be missed and employment will be lost; but if it is seen as an opportunity to set new goals and collaborations, then it will result in green growth for the auto industry and its supply chain.

Alexandra Kuyo's article, 'The 2024 changing rules of origin in the UK-EU TCA are unattainable!', winner of the 2023 Gerpisa Young Author Prize, takes, by contrast, a more pessimistic view on the political construction of the European EV market. By analysing the complex negotiations behind the recent last-minute extension of the rules of origin that apply to the trade of EVs between the European Union and the UK, the article highlights the increasing discrepancy between, on the one hand, the assumptions on which both the EU and UK governments are pushing forward electrification, and, on the other hand, the reality of EV production and markets that appears to be more problematic than what politicians are ready to accept.

In concrete terms, the new regulation expected European and British local content of batteries for EVs to increase from 30% to 60% for the battery pack, and from 30% to 50% for the battery cells between 2021 and 2024, as a condition to keep exempting from tariffs EVs traded between the EU and the UK. However, such a rapid increase in local content would have required the structuring of a significant European and British supply chain for battery production that in fact did not materialise. The article shows that despite some clear evidences of this contradiction were provided both by OEMs and European battery manufacturers, EU and British officials persisted in denying them until the very last minute. And even when they eventually granted the extension for the existing regulation, which came as a surprise for the stakeholders involved, the full application of the new rule of origins for 2027 – when local content requirements are expected to increase to 70% for battery packs and 65% for battery cells – was, against all logic, maintained.

The accident not only reveals a surprising lack of communication and trust between industry and government representatives, but also points to the more general absence of a coherent strategy of electrification in Europe, one that would be shared by both governments and industries.

So far, we have discussed the sustainability of the process of electrification from the perspective of the industry, its capacity of manufacturing EVs, creating employment, structuring domestic supply chains for the production of batteries. The article by Juliano Pelegrina, Adriana Marotti de Mello, João Valsecchi Ribeiro de Souza, Roberto Marx and Matthieu Montalban, 'Managing peer-to-peer on-demand mobility service ecosystems to create shared value', approaches the question of sustainability from a different angle: the potential contribution of shared peer-to-peer and on-mobility services to more sustainable mobility and business models.

So far companies like Uber, Didi, Lift, iFood, Deliveroo, etc. have not lived up to the expectations of contributing to decarbonising the transport of people and goods and have been criticised for their disruptive impact on traditional markets for mobility, their poor working and employment conditions, their lack of ethical commitment and their harmful impact on environment. While the article reviews all these issues and their main causes, it also elaborates a new analytical framework to identify the conditions under which these negative externalities could be reduced by creating more shared value. It relies on three case studies of ride-sharing (Saluber in Italy and 99 in Brazil) and food-delivery (open delivery in Brazil) that illustrate different complementary strategies aiming at reconceiving markets in more inclusive ways, at redefining platforms' productivity to integrate environmental gains, and at promoting cooperation between private and public actors to enlarge the number of users and companies benefiting from platforms.

In the quest for sustainability the integration between new mobility services and electrification appeared from the beginning as a logic development, but since the early failure of the iconic electric car sharing of Autolib in Paris, this has not been the case. An important contribution of the article is to suggest ways to re-enact this possibility, by integrating more collaborative and inclusive private mobility platforms with a wider public eco-system of mobility as a service.

Finally, to complete our journey from the product development of new EVs until the end of life of vehicles, the Kriengkrai Techakanont and Tassanee Homklin's article, 'The prospect of moving towards a circular economy in creating ELV recycling systems in Thailand', explores in detail how an emerging economy with an extremely old car fleet deals with the challenges and the opportunities of circular economy. This very interesting case study has a lot to tell about the key role of the state in regulating the whole life of the vehicle, the importance of raising public awareness concerning the negative externalities of unregulated end of life vehicles, and the necessity of finding new legal devices and business models to institutionalise extended producer responsibility (EPR).

While the article highlights the successful deployment of similar policies in Europe and Japan, the challenge represented by the reconditioning and the recycling of EVs within the framework of EPR raises new important and difficult questions everywhere, including core developed countries, in particular for OEMs, but also for the traditional players of the car repair sector. From this perspective, this article is an important contribution to a fast growing body of literature on circular economy models that will take an increasingly critical place in the research programme of our international network.

All together, the five contributions to this special number represent very well the interdisciplinary richness that characterises our international network, as well as its capacity of apprehending the transformations of the automotive sector through all the value chain and from very different but complementary angles.

The next international colloquium of Gerpisa, in Bordeaux from the 25th to the 28th of June 2024, will be the opportunity to bring back in these rich debates a central question for the history of our international network that was already at the core of the first international programme of research on new productive models directed by Michel Freyssenet and Robert Boyer back in the 1990s: the convergence and divergence of trajectories of change and whether the global automotive sector is still converging towards the connected autonomous shared electric (CASE) cars paradigm or not.