The future of the European automobile industry

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The European automotive industry at crossroads

Key findings of a study by the European Trade Union Institute and the European Climate Foundation

The transition in Europe towards electric cars looks ever-more inevitable (Figure 1 in annex). Europe's objectives on climate, air pollution, energy security and industrial competitiveness are now fully aligned in this direction. Other proposed solutions, such as e-fuels, biofuels or hydrogen look unlikely to play more than a niche role in future cars.

Initially, this change has been driven by environmental and climate policy, that goes back to the early 1990-s. The last 30 years of EU car emissions regulation has been a controversial process with zig-zags and often contradictory objectives. From early on, the EU was focusing on CO2 emissions (fuel efficiency) but neglected pollution standards (e.g NOx) for too long. Self-regulation of the industry has failed to meet the 2008 targets, then stricter and binding criteria followed, but the asymmetry between climate and environmental standards continued paving the way to Dieselisation and up-marketization. This trend was aggravated by lax testing procedures and implementation and with criminal practices of car manufacturers led to the Diesel scandal. Weight-based CO2 standards also contributed to an adverse development, as cars have become heavier, more powerful and more expensive compromising a significant share of the achieved emission reductions. This malfunctioning regulatory framework also resulted that when the European Green Deal had finally been set up, fast-track electrification remained to only option to deliver the 100% emissions reduction target by 2035, as set by the Fit for 55 package. . At the same time this fast-track transition to electromobility is increasingly being driven by technology improvements and market forces. If this rapid transition was ever in doubt, the new European imperative to reduce spending on Russian oil provides a further impetus. The train has departed and the journey is gaining ever-more momentum.

The industry finds itself in a paradigm change, some call it a revolution, others say mobility will cease to exist in the way we know it. It is no exaggeration to say that every job in the mobility sector will be disrupted in some way.

One key lesson of country reports and transversal studies of this project is that while electrification of individual road transport is the focus, i.e. the change of the propulsion system from fossil fuels to clean electricity, the transformation is much more comprehensive. While it is clear the manufacture of battery electric cars is less employment intensive (Figure 2 in annex), many other changes happen at the same time. Digitalization of both the product and the process, automation of production and a complete reorganization of automotive value chains are also underway. As a result employment effects due to deep structural change will be enormous. Millions of jobs will disappear, while others with completely new job profiles and skills needs are being created. None of the 14 million jobs in the broad sector will remain unaffected.

This paradigm change also means that established incumbent positions that have been built up for decades are being challenged. Newcomers have been able to enter the market in a way that was hard to imagine before. Past success offers no template for the future. All this happening in a new era of de-globalization, in wake of the supply-chain disruptions under the pandemic and due to the end of the post-WW2 rule based international order, accelerated by Russia`s invasion of Ukraine. The geopolitical stakes have become even higher now.

The impact on employment of any one strategy is difficult to determine. Forecast results depend on the scope of the analysis (narrow, broad automotive sector or whole economy); on assumptions about

developments in sales volume; productivity; value composition, and more. The sectoral dimension can range from a narrow view of jobs in powertrain manufacturing to a comprehensive view including adjacent industries such as charging infrastructure. Table 1 (in annex) sums up the main results. The common feature is that electrification and automation result in job losses in the narrow automotive manufacturing sector that includes the battery (assuming stable new car sales). One compensating factor (within the sector) is the increasing value added from electronics and autonomous drive systems and the labour demand for setting up and maintaining the charging infrastructure. Another common feature of employment forecasts is that millions of jobs in the sector will be fundamentally transformed, in terms of skills, place, contract type and working conditions.

While most fears by industry actors, but also media attention, has been focused on employment loss due to electrification, there has been little attention paid to what would happen if Europe's car industry failed to keep pace with fast-evolving zero-emissions technologies. Certainly, China, South Korea, and many US companies aim to gain a competitive advantage in these technologies in the future. The greatest risk is missing the train. If European industry and policymakers were to slow down the mobility transition at this stage, it might undermine European competitiveness, creating the worst of all employment scenarios in the long-term.

At this point, focusing on aggregate job gains or losses is therefore less important than developing solutions to help European companies, regions and workers master the transition. Even if the transition is managed in such a way that overall employment remains relatively constant, there will be stark impacts at a plant-level and at regional level. Studies in this project revealed the depth of changes taking place at national level, at the level of main manufacturers and suppliers under a fierce cost and technological competition.

Despite its late start, Germany seems to be well equipped for the transition, with massive investments into electrification, with rapid expansion of battery manufacturing and with a co-operative industrial relations culture. Still, even the headquarter of its flagship manufacturer, Volkswagen, faces constant cost pressure and insecurity. A one hundred year-old Daimler plant in Berlin that was specializing in powerful combustion engines has only nearly escaped its closure, as it will become the digitalization center of the group. There will be no employment loss, but job profiles will be radically transformed. France, which saw a sharp fall of its market share in the last decade, hopes for a stabilization through technological change and electrification. Both core countries try to keep as much competence in the new technologies at domestic locations, as possible. Central Eastern Europe, the main beneficiary of the post-enlargement expansion of the automotive industry is now facing an uncertain future. The region is vulnerable and dependent on decisions made at headquarter locations. While some see potential in keeping combustion engine and hybrid technology alive for longer – thereby risking long-term competitiveness in return for short-term stability -- others are embracing the transition to e-mobility by embarking on strong supplier positions, eg. in battery manufacturing.

As the battery makes up a large share of the value added for BEVs (36% on average in 2020) and has a key role in stabilizing employment, this project took a closer look at the battery value chain.

In the first decade of automotive electrification, the development and scale-up of battery cell manufacturing has largely taken place outside of Europe. At the beginning of the second decade of automotive electrification, Europe is now on the right path to develop its own "local" battery cell manufacturing industry. Europe was successful in establishing a strong innovation network in all phases of battery manufacturing and is now catching up with leading Asian manufacturers.

The EU is on a promising pathway towards building up capacity and competence, but risks remain. There are important decisions to be made about which battery chemistries to pursue. Current trends show European manufacturers moving towards upmarket segments, while the lower price segment is being neglected. This might lead to a future equity issue, a market vulnerability, and a slower transition in lower-income countries. Critical raw materials are overwhelmingly imported, creating supply chain risks, while efforts to develop domestic mineral resources in Europe are often met with local opposition.

There are important challenges to be overcome before this transition can be considered a success. Rolling out sufficient charging infrastructure across Europe will require determination; close attention must be paid to affordability, both for low-income households and for low-income regions.

Key findings

- The EU regulatory framework on car emissions has taken a bumpy road in the last 30 years. Climate and environmental targets were inconsistent, testing procedures were malfunctioning, while weight adjusted CO2 standards were in favour of heavy and powerful cars compromising a large part of achieved emissions reductions.
- Not least since the announcement of the European Green Deal the transition to e-mobility is inevitable due to both policy and technology cost reductions but also to market developments.
- In the new geopolitical constellation, after Russia invaded Ukraine, this became even clearer. Climate, pollution, energy security and industrial competitiveness are now fully aligned. ICE phase out starts to look certain.
- While some see potential in keeping combustion engine and hybrid technology alive for longer – thereby risking long-term competitiveness in return for short-term stability -- others are embracing the transition to e-mobility
- After a late start, the EU is well placed in this rapid technology race, including also vertical integration that includes the battery value chain. It must continue to do so urgently to protect domestic auto sector jobs. The alternative – not competing – is far worse.
- Even if well placed, economic geography risks are mounting – competition from both China and the US is increasing, and accessibility of key raw materials is a strategic weakness for Europe.
- Regional disparities might grow and will need policy attention (core-periphery, original equipment manufacturers – suppliers)
- Employment change at aggregate economy level might be minimal and is not the key issue to address
- While electrification results in employment loss in the narrow automotive manufacturing sector, slower transition that has often been seen as smoothing out transition risk, is actually the biggest risk, and could potentially lead to bigger losses in both competence and jobs in the future
- Employment effects due to deep structural change will be enormous, none of the 14 million jobs in the broad sector will remain unaffected. Millions of jobs will disappear, while others with completely new job profiles and skills needs are being created.
- Regional employment effects (within and between member states) might be harsh.

The weight adjusted emissions standard and the incentives provided for PHEVs drive an up-market drift, where cars are becoming bigger, heavier, more powerful and more expensive. Higher prices reduce affordability and create new inequalities, at the same time leaving the lower segments of the e-mobility market to possible new market entrants and putting future EU automobile jobs at risk.

Policy recommendations

- With the 100% emissions reduction for new car and van sales by 2035 set, a clear and timely trajectory to 100% zero-emissions is needed. The application of weight adjustment for car CO2 targets needs to be revised, such as the preferential treatment of heavy PHEVs.
- Just transition policies will be needed to help this massive restructuring process. The excuse that the Just Transition Fund is meant for carbon intensive sectors and regions and that this is not the case for the automotive industry, cannot be taken seriously. This industry is undergoing an unprecedented restructuring not because the production process being carbon intensive, but because of the use of the product.
- The Just Transition Fund needs to be expanded and made accessible for the automotive sector and regions and a just transition framework tailored to the needs of the industry needs to be set up.

- Social and employment policies should create an enabling policy environment for managing employment transitions, skills development and job displacements. While most competence for these is concentrated at Member State level, guidance should be provided at the European level.
- The distributional effects of mobility change need to be addressed (e.g. via fiscal policy) – accessibility and affordability of zero-carbon transport, including also to manage car fleet change from ICE to BEV.
- In this respect the upcoming Social Climate Fund needs to be expanded and refocused to better include mobility.
- The EU will need to re-regulate second-hand car markets. The practice that CEE countries are used as depository for outdated high-emission ICE second-hand cars is not sustainable.
- Faster electrification of corporate car fleets can help promote more affordable EVs in second hand markets.
- A rapid and coherent expansion of the charging infrastructure with massive investments should follow.
- Electricity grids and clean electricity should be developed and upgraded to meet the demands of vehicle electrification, and made ready for smart charging solutions.
- Electricity markets need new regulation to make sure that electricity market prices are not linked to fossil energy price.

Annex

Figure 1

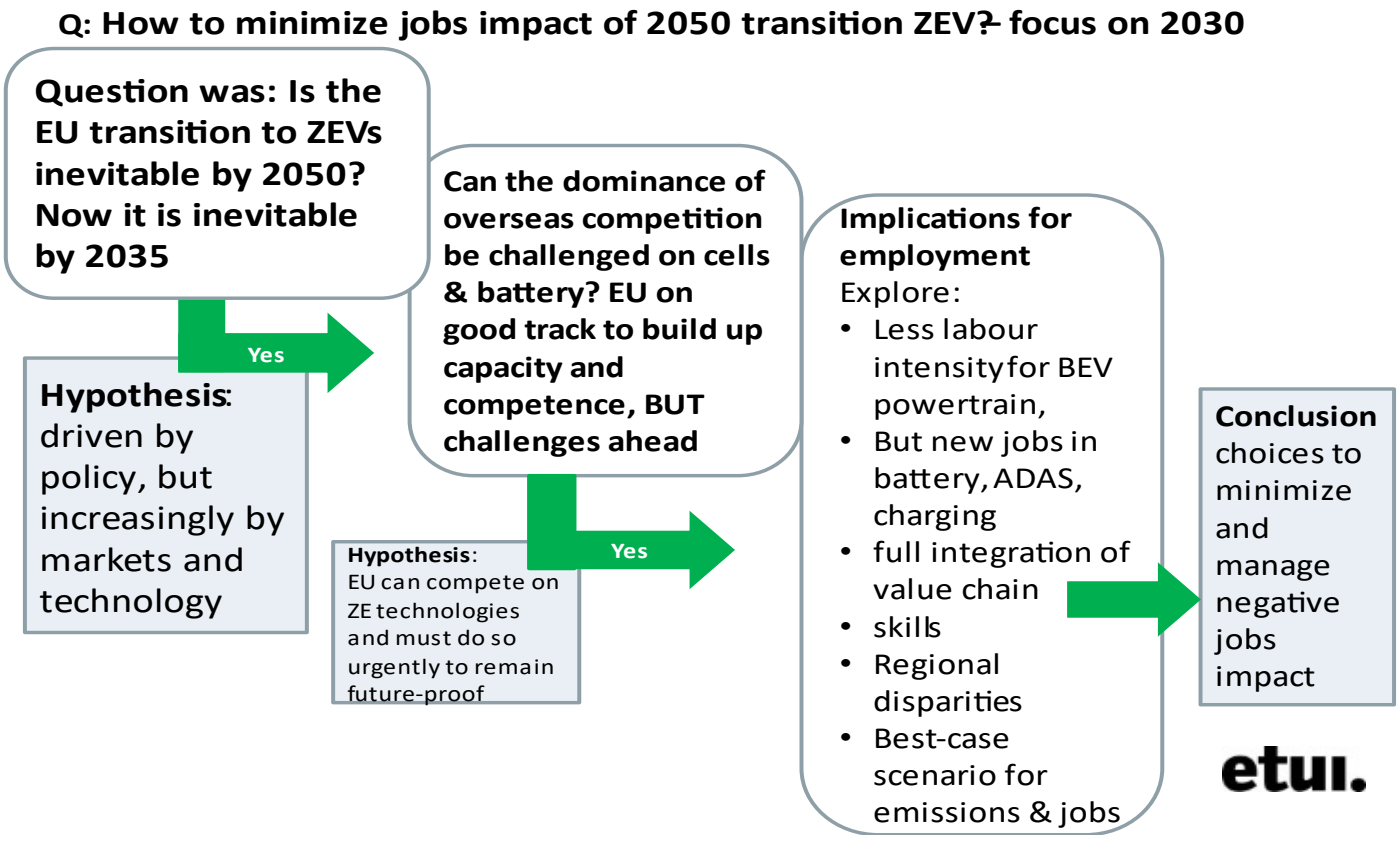
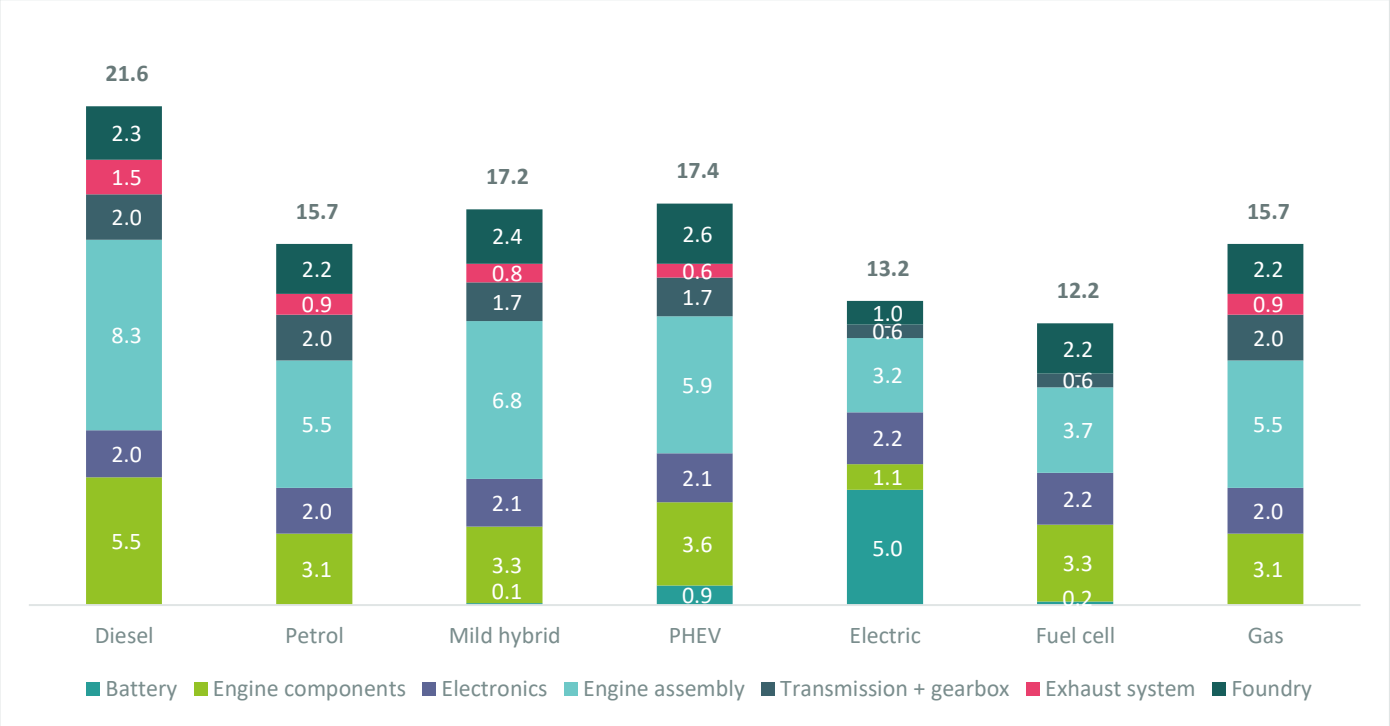


Figure 2 Employment indices by propulsion technology in France (FTE needs for 1,000 vehicles)



Source: Syndex

Table 1: Comparison of employment studies

Study	Period	Value Chain	Focus	Country	Trend	Net Employment Effect
Wagner et al. (2019)	2015-2035	National cell production	Employment per component, full vehicle	GER	Automation, electrification, productivity, market volume, technology, mobility behaviour	+42 000
CLEPA (2021)	2020-2040	Full EU battery value chain including processing of raw material	ICE and BEV supplier, powertrain component	EU	Electrification	-417 000 in radical scenario, -275 000 in EV only scenario, +122 000 in mixed technology scenario
Schade et al. (2020)	2018-2035	National cell production	Transport industry	GER	Automation, electrification, productivity, market volume, technology, mobility behaviour	+234 000 (total economy)
Agora Verkehrswende (2021)	2020-2030	National cell production	Automotive and adjacent industries	GER	Market volume, technology, product mix, productivity, electrification,	+25 000
BCG (2021)	2019-2030	EU cell production	Automotive and adjacent industries	EU	Market volume, technology, product mix, productivity, electrification	-35 000

Source: M-Five own illustration.