



Electric Vehicle Transition Impact Assessment 2020-2040:

Study on Workforce of Automotive Suppliers

Acknowledgements

This summary brochure of the study ‘Electric Vehicle Impact Assessment Report 2020-2040: A quantitative forecast of employment trends at automotive suppliers in Europe’ was produced by CLEPA and represents CLEPA views only.

Technical analysis carried out by PwC Strategy&

Published: December 2021

The full report can be downloaded [here](#)

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A successful transition starts with knowing the stakes

Reaching climate neutrality in the EU by 2050 requires ambitious emissions reductions. This means an unprecedented transformation for the automotive industry and its supply chain, and one that will have a major impact not only on employment, but also on consumer choice, the affordability of individual mobility, and EU competitiveness. The face of the industry will change as a result of the transition to electric powertrains, the use of renewable fuels and energy sources to power vehicles, and the restructuring of production sites and the workforce.

CLEPA fully supports the objectives of the Green Deal. In fact, automotive suppliers design and manufacture all of the components and systems that are needed to achieve the ambitious goals for road transport. Our members invest heavily in new technologies and create the new product portfolios needed to achieve smart, safe, and sustainable mobility.

The automotive manufacturing sector is responsible for more than 5% of the overall manufacturing employment in 13 EU Member States, with more than 60% of these workers employed by automotive suppliers (1.7 million). Around one third of these are dedicated to the development and production of internal combustion engine technology.

Automotive suppliers alone currently employ about 600,000 people, whose work depends on the internal combustion engine. The livelihoods that depend on those jobs need to be taken into consideration. The production of battery electric vehicles (BEVs) will create new employment opportunities, but often for different people, in different companies, in different regions and at different times. It is therefore critical that we assess what different policy approaches would mean for employment, the economic fabric and the realisation of climate targets.



Industry at a glance



1.7 M

Direct automotive supplier jobs in Europe



€ 340 bn

Annual turnover in the EU27



75%

Of the vehicle value comes from suppliers



± 9.000

Patents filed by the automotive industry each year



€30 bn

Invested in R&D each year, 30% of private sector R&D investment in the EU



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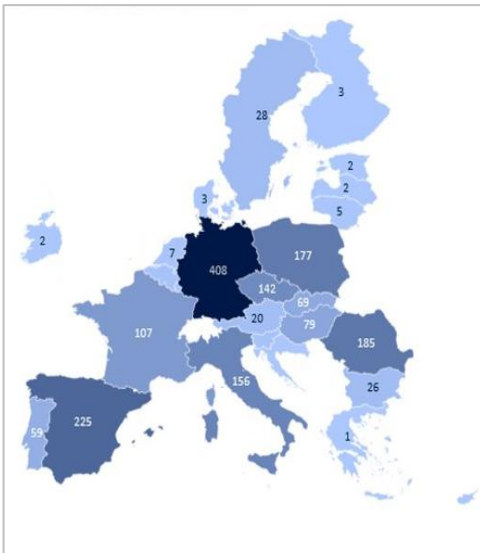
National automotive associations and 14 sector associations within CLEPA



CLEPA represents over 3.000 companies covering the production of all the 30.000 parts composing a vehicle

Employment figures

Automotive suppliers directly employ 1.7 million people across EU 27, on top of the 1.2 million with vehicle manufacturers.



Employment in thousands of jobs, European automotive supply sector

Source: Eurostat and National Associations

OEMs
1.2M

Automotive suppliers
1.7M

Powertrain production¹
600k

¹ EU27 + UK

Reaching climate neutrality in the EU by 2050 requires ambitious greenhouse gas emission reduction. The proposed CO₂ regulation for passenger cars and vans introduces a 100% reduction of CO₂ by 2035: a de facto ban on the internal combustion engine (ICE), should the current tailpipe approach be maintained. Such an approach will dramatically impact the livelihoods of hundreds of thousands of people. Around one third of workers in the automotive supply industry are dedicated to the development and production of internal combustion engine technology.



Scope of the study

The 'Electric Vehicle Impact Assessment Report', commissioned by CLEPA and performed by PwC Strategy&, assesses the impact of electrification on powertrain employment and value creation across the EU and individual member states.

The study answers three guiding questions about the impact of the electrification transition on the automotive supply industry:

- 1. What is the impact of different powertrain technologies and component requirements on value-add¹ for automotive suppliers in Europe?*
- 2. What is the corresponding effect on employment for automotive suppliers in Europe?*
- 3. What would a mixed technology, an EV-only or a radical EV-implementation scenario mean for climate targets, value-add¹ and employment for automotive suppliers in Europe?*

This is a first of its kind study, weighing the impact of three different market scenarios specifically for powertrain employment and value-add among automotive suppliers, giving the actual transformation a much more granular view.

The study's methodology is complementary to previous studies as it combines a macro market model with production planning insight at company and plant level. Data was gathered by PwC Strategy& – supported by CLEPA, national associations and companies – in an explorative survey based on 199 questionnaires and validated with 33 expert interviews. The scope of the study covers the EU27, EFTA² and the UK. Additionally, seven countries (representing 74% of automotive activity) were analysed in detail: Germany, Italy, France, the Czech Republic, Spain, Poland and Romania.




¹ Value-add is defined as revenue minus material costs and describes the part of the company's individual value creation that directly contributes to the country's economy.

² European Free Trade Association, which includes Switzerland, Lichtenstein, Norway, Iceland.

The three scenarios

The study assesses the impact of three different Green Deal policy scenarios on employment and value-add among automotive suppliers across Europe in the period of 2020-2040.

The scenarios represent a *mixed technology* approach, an *EV-only* approach as proposed in the 'Fit for 55' package, and a *radical* EV ramp-up scenario. All three scenarios assume accelerated electrification to meet climate goals, with a high market share for electric vehicles by 2030 of more than 50%, almost 80%, and close to 100%, respectively.

	Mixed technology 	EV-only 	Radical 
	< 1m EV chargers	1m EV chargers	> 1m EV chargers
2024	Incentives for Battery Electric Vehicles (BEV) purchase but not for the charging infrastructure	Incentives for BEV purchase and for the charging infrastructure	Incentives for BEV and large incentives for the charging infrastructure
2026	Technology open EURO 7, including Mild Hybrid Vehicles (MHEV) in operation	Technology restrictive EURO 7, Full Hybrid Vehicles (FHEV) favoured	Very technology restrictive EURO 7, no MHEV allowed
2030	Equivalent -50% tailpipe CO ₂ emissions with A-fuels credit of -20g	Equivalent -60% tailpipe CO ₂ emissions with A-fuels credit of -7g	0g CO ₂ target for new vehicle fleet
2035	Equivalent -65% tailpipe CO ₂ emissions with A-fuels credit of -30g	0g CO ₂ target for new fleet with A-fuels credit of -10g	Explicit end of ICE vehicle sales



Key findings



Electrification puts **powertrain employment** significantly **at risk** (potential net loss of up to 275k employees until 2040)
– *In all, 501k jobs at stake in the ICE domain, without counting employment created by electrification*



Majority of future value-add in EV powertrain technologies depends on **EU battery production** (70% of value-add)
– *Subsequently, European employment significantly depends on local battery production*



A steep **net reduction** of 291k jobs is expected **between the 2030 and 2035** timeframe alone
– *A total of 359k jobs impacted in the ICE domain alone, putting pressure to transform towards future needs (e.g., software, electronics, infrastructure)*



A **mixed technology** scenario **mitigates** the impact on employment and creates value-add until 2040
– *This would be driven by hybrid vehicles market share*



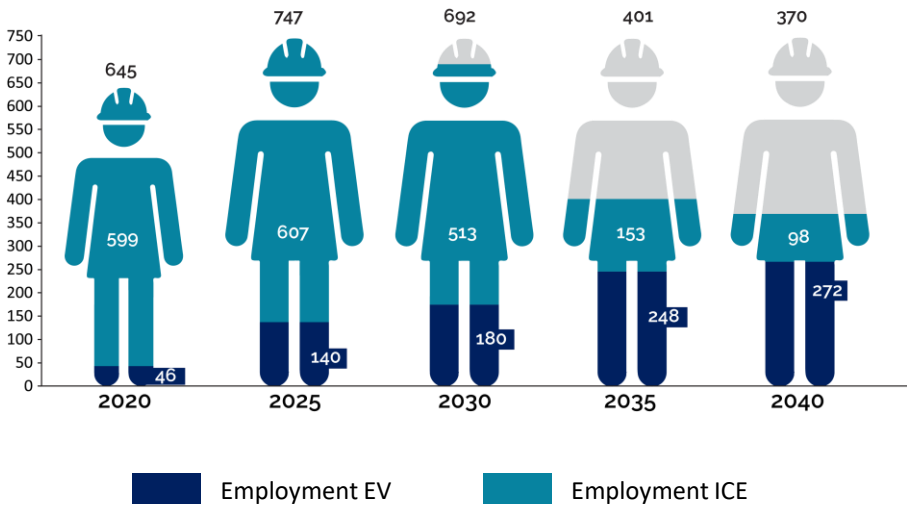
Western European countries will likely be best placed as strongholds in **EV production** (+56,2 €bn value-add until 2040)
– *By contrast, Central Eastern European countries will shape the run-down of ICE vehicle production*

An EV-only scenario will shed half a million auto supplier jobs

-84% of current jobs in ICE

EV-only scenario

Employment in thousands



- Slight **employment increase** in ICE powertrain **expected between 2020 and 2025** due to advanced ICE technologies (EURO7) and demand increase, followed by constant decline
- **501K jobs in ICE powertrain will become obsolete** from now until 2040; this is about 84% of current ICE jobs
- EV powertrain **creates 226k new opportunities**, but we still have a **net loss of 275k jobs** to 2040
- **Not a 1:1 compensation** from ICE to EV powertrain employment; different companies, different skill sets, different regions and at different times



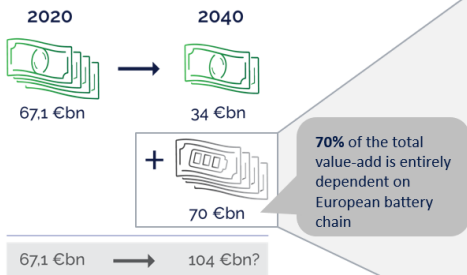
Majority of value-add hinges on uncertain EU battery value chain

In an EV-only scenario, **70% of value-add** (or approximate 70 bn euros) is entirely dependent on the **development of a full EU battery chain**.

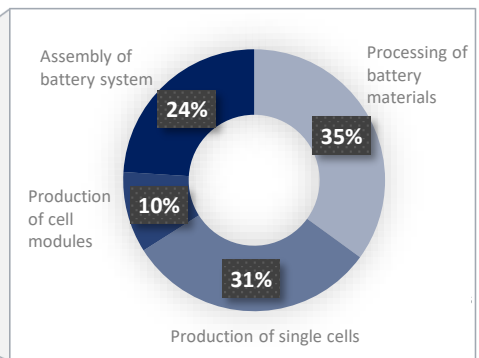
While creating opportunities, significant **uncertainty remains around when a competitive EU battery chain will materialise**. Can the EU risk job cuts and competitiveness **now**, without secured sourcing for raw materials and domestic production of battery materials and cells **guaranteed for the future?**

A mixed technology approach would help mitigate risk and create a more manageable transition.

Supplier powertrain value-add



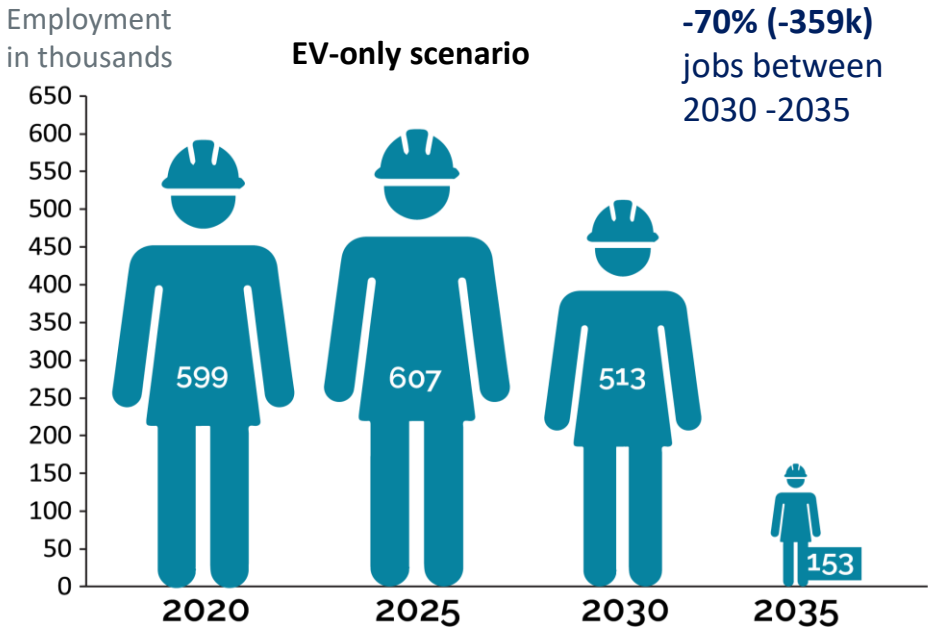
Share of battery value-add by area of activity



The future value-add and job creation in EV powertrain technologies depends on local battery production in Europe.

Transition vs disruption – Every moment counts

501,000 auto supplier jobs in ICE powertrain production are expected to become obsolete by 2040, should the technology be phased-out in 2035. **70% of ICE job losses from now until 2040 will occur in just a five-year period.**

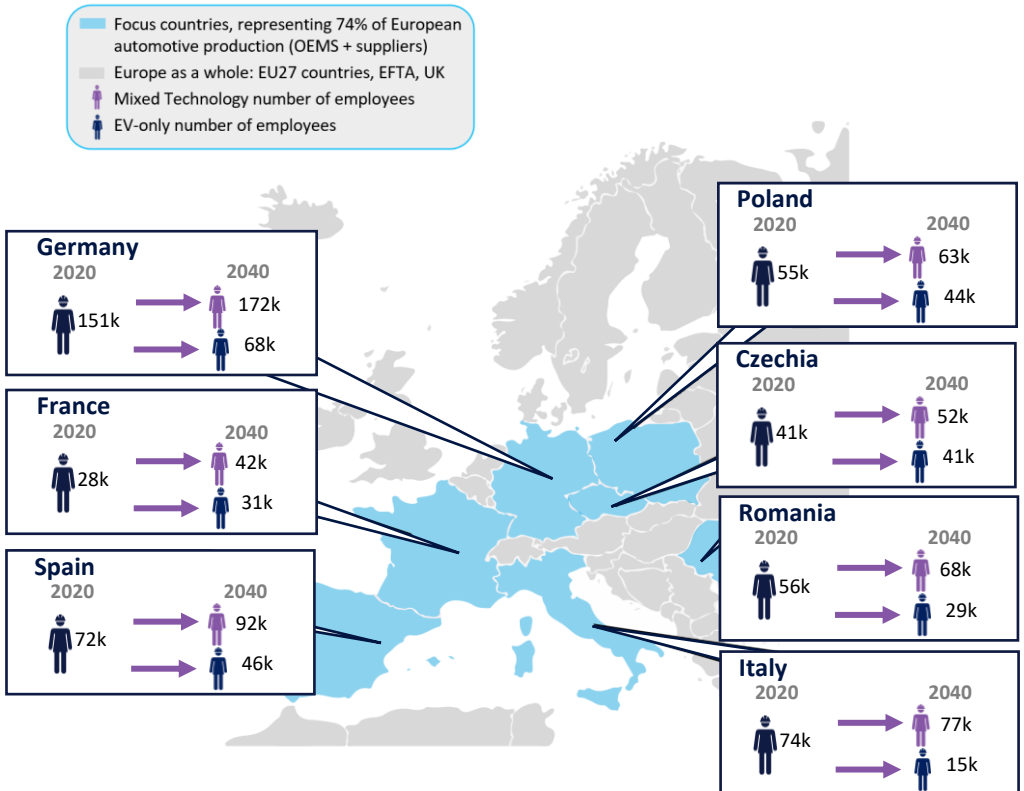


- **2030 is "just around the corner"** for an industry with a product-development lead-time of around 5-8 years
- **The more abrupt the loss of ICE powertrain** (35% of overall employment) **the greater the pressure** on regional economies, and the more limited the time to re and up-skill workers
- **Social disruption due to a badly managed transition** could severely undermine the ability of the **European Green Deal to succeed** and could cause long-term damage to our economies and societies

Geographical breakdown



An EV-only scenario may lead to regional inequalities



In an EV-only scenario, countries with currently almost no EV production and employment and with limited green energy will see an **overall decrease in technology areas between 2020 and 2040**. Most of the focus countries in the study (e.g., Germany, Italy, Spain and Romania) are likely to need fewer employees in 2040 than in 2020.

The figure above shows that **every country would substantially benefit from a mixed-technology approach**, avoiding social disruption, limiting inequality among the regions and making the transition more manageable.

Green AND Just?



The automotive powertrain industry will face **a peak in value-add and employment in 2025, followed by a very steep decline**. Powertrain technology suppliers are tasked to invest in new technologies while needing to balance short-term investments in advanced ICE: a technology that builds a bridge for society to transition, but that would be phased-out in just a few years time if current policy preferences prevail.



An abrupt loss of powertrain employment will place great pressure on regional economies and provides limited time to reskill workers. Growing regional inequalities is a real risk. **Central and Eastern European countries will shape the rundown of ICE powertrain production**. A sustainable pathway to transition is needed, and it is important to have technology openness to maintain the labour force after 2035 in these parts of Europe too.

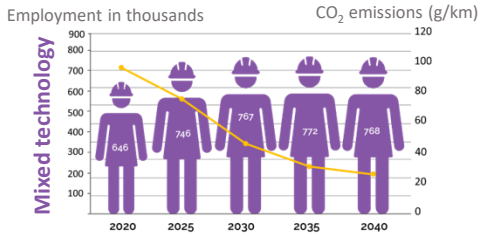


While automakers have greater capacity to divest or insource activities to manage the transition, **automotive suppliers can react with much less agility**, bound by long-term contracts with vehicle manufacturers. In addition to global and well-capitalised industry leaders, the supply sector consists of hundreds of specialised companies and SMEs with less access to capital and less ability to ramp up new and scale down existing production lines at the same time.

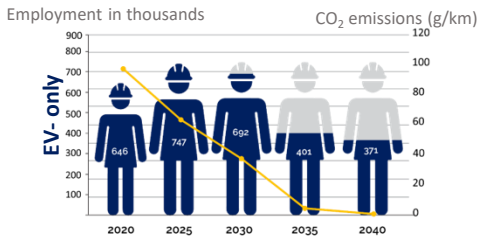
A technology open approach is the EU's safety net for a manageable transition towards sustainable mobility



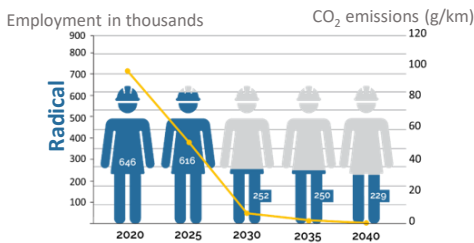
A mixed technology scenario provides the most manageable transition



The mixed technology scenario only sees a 4k employment loss in 2035-2040, with employment peaking at 767k in 2040.



An EV-only approach leads to a steep decline in jobs in just a five-year period (2030-2035).



A radical scenario is completely unmanageable for industry and society, with 364k jobs lost even five years earlier: between 2025-2030.

— Emissions curve

A mixed technology approach does not compromise on climate ambitions, with a modelled 50% CO₂ reduction in 2030 (up from the currently mandated 37,5% and compared to the proposed 55% in “Fit for 55”). The mixed technology approach combines accelerated electrification with the use of renewable sustainable fuels, also known as a well-to-wheel approach.

Call to action to secure a green AND just transition



Without compromising on climate, **technology openness** gives industry the needed time to transition. Maintaining a globally competitive automotive industry in Europe will help mitigate the social disruption often coupled with abrupt change.



A **regulatory framework that is open to all available solutions**, like the use of hybrid technologies, green hydrogen, and renewable sustainable fuels, will enable **innovation and choice** as we redefine mobility. This is not about choosing either electrification or internal combustion, but rather about using technology fit for purpose, securing employment, EU competitiveness, consumer choice and affordability.



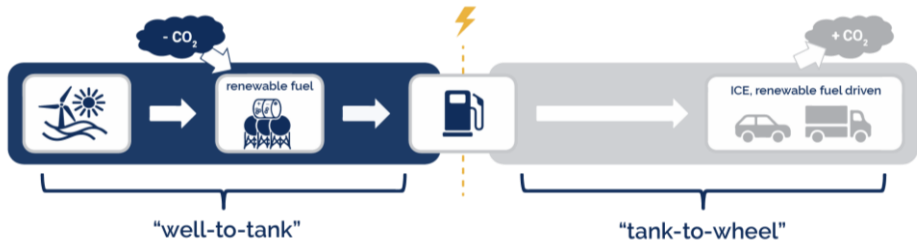
As much as an electric vehicle is only as green as the source of electricity used to power it, a hybrid, petrol or diesel engine can be **climate neutral with defossilised fuel**. Emissions from vehicles should ideally be regulated on a life-cycle basis, with a Well-to-Wheel (WtW) approach as a first step.

We shouldn't be *outcome-neutral* - but should be very careful giving up on *technology-neutral*



No sustainable mobility without a well-to-wheel-approach

Current vehicle CO₂ emission standards do not value the **contribution of sustainable renewable fuels**.



Well-to-Tank: Fuel suppliers are responsible for emissions from transport fuels from the original energy source (“well”) to the vehicle (“tank”). They are subject to regulations such as the revised Renewable Energy Directive (“RED”) and further regulatory requirements that essentially focus on the quantities of fuel consumed.

Tank-to-Wheel: Vehicle manufacturers are responsible for direct emissions from the vehicle, i.e. on the way from the tank to the wheels. Emission reductions are regulated through tailpipe CO₂ emission standards for new vehicles. OEMs have to fulfil a certain average fleet target for new vehicles sold each year.

To incentivise technologies with the lowest overall carbon footprint, **emissions from vehicles should ideally be regulated on a life-cycle basis, with a Well-to-Wheel (WtW) approach as a first step**, which considers the production and distribution of the fuel/electricity used to power a vehicle. Emission reductions on the fuels/energy production side should be recognised when determining compliance with CO₂ standards, for example, through the introduction of a [voluntary crediting mechanism](#), which provides an additional option for automakers to fulfill the fleet-wide targets with volumes of sustainable renewable fuels.

Automotive suppliers' key messages on 'Fit For 55'

All renewable energy solutions and clean drivetrain technologies are needed to decarbonise the road transport sector and achieve the EU's climate neutrality objective.



Ensure a technology open approach

- Enable the deployment of all clean drivetrain technologies (battery electric, fuel-cell electric, mild-, full- and plug-in hybrid, hydrogen combustion)
- Avoid technology bans, closing doors to innovation
- Shift from tailpipe to well-to-wheel



Recognise the role of sustainable renewable fuels

- Acknowledge the role of sustainable renewable fuels
- Build on available infrastructure and mandate availability of sustainable renewable fuels
- Introduce a voluntary crediting scheme
- Set a more ambitious GHG intensity reduction target in the transport sector



Provide time for a manageable social transition

- Ensure accessible and affordable mobility for all
- Ensure a manageable transition to electrification considering the impact on hundreds of thousands of livelihoods
- Support the massive re- and upskilling efforts undertaken by industries and regions