



Transform pandemic into opportunity
Towards a joint EACN vision
for the European Automotive Industry

June 2020

<https://www.eacn-initiative.eu/> - info@eacn-initiative.eu



Co-funded by the COSME programme
of the European Union

Since 2017, European automotive clusters are cooperating in the European Automotive Cluster Network EACN with a focus on support actions to boost industrial modernisation of their members, generate confidence between cross-national actors, and stimulate cooperation in innovation and business to face together competitors from other continents and strengthen the European automotive industry as a whole.

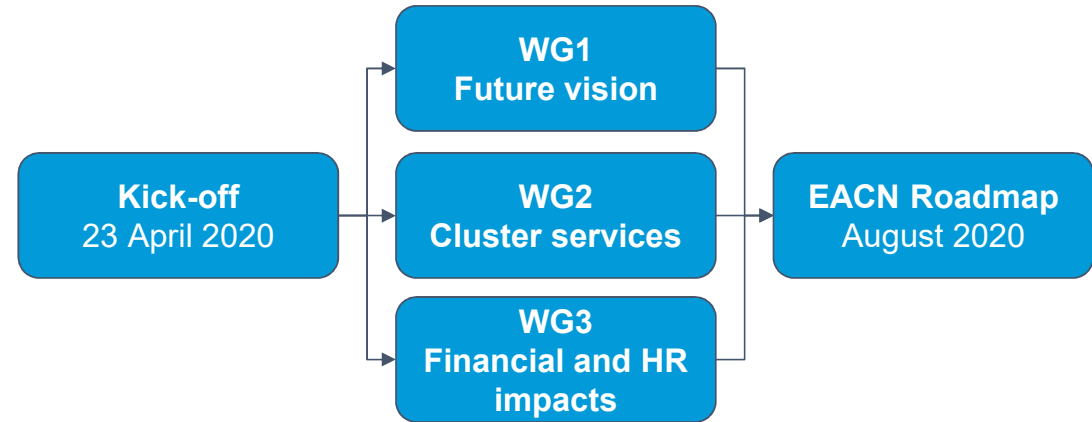
With the upcoming Covid-19 pandemic, **EACN partners decided to launch specific actions aiming at gathering the concentrated knowledge and expertise of the 19 EACN partner clusters** to dress an image of the current situation in the automotive industry, to develop a joint vision for the future automotive landscape, and to imagine and launch (joint) cluster services helping cluster members master immediate and long term impacts.

Via these actions and services, the **EACN clusters want to contribute to a strong and competitive European automotive industry**, and to accompany their members in the upcoming transformation processes.

EACN partners used a two phase approach to address the topic: In a first step, **three Working Groups (WG) worked on dedicated subjects**:

- A joint future vision for the European automotive industry:
- Pandemic impact on companies
- Best practice exchange and innovative cluster support services

The second phase consist in the elaboration of a **joint EACN Roadmap defining objectives and the work programme for the next years**.



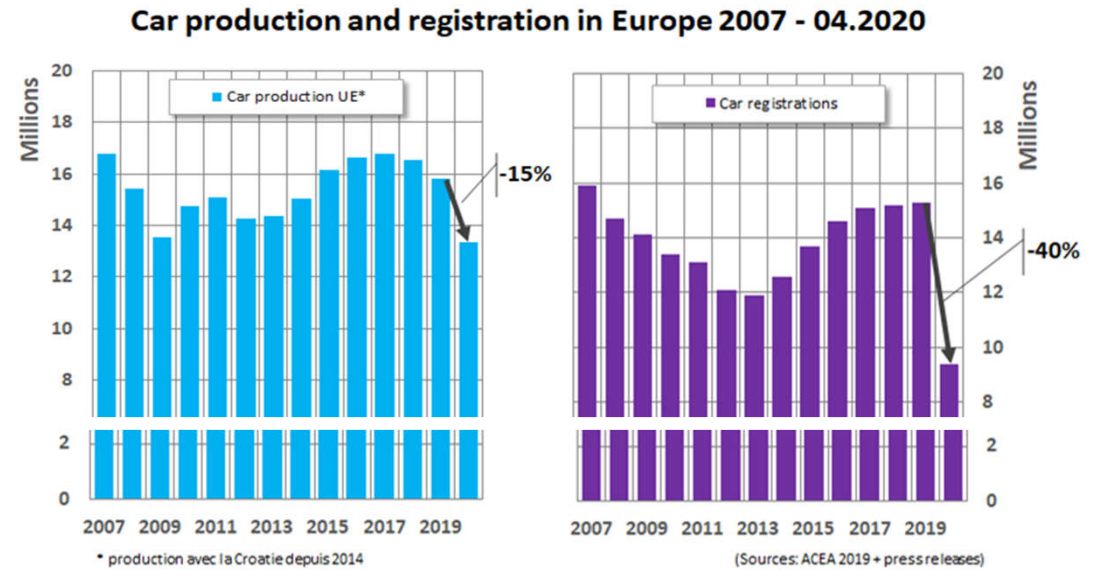
EACN thesis

- #1 – The EU Automotive industry already faced multiple challenges before the pandemic
- #2 – Pandemic impacts are creating additional short-term pressure on companies
- #3 – Pandemic consequences will fashion the urban mobility landscape in a long term
- #4 – Future market evolution will be technology driven
- #5 – The automotive core competence in the future resides in the electric powertrain
- #6 – Reduced financial capacities shall not delay further technological innovation
- #7 – The EU Automotive Industry must contribute to European sustainability goals
- #8 – The whole EU Automotive value chain must become highly flexible and automated
- #9 – The automotive industry landscape must better resist to global crises

“Since the 1990’s the European automotive industry has been organised in trans-European rather than national production networks. The 2008-2009 economic crisis was an important turning point for the European automotive industry. The crisis led to consolidation among suppliers and redefinition of supply chains.

After several years of decline, **car sales on the European market had fully recovered** by 2016 reaching 14.6 MM cars sold. However, the Dieselgate scandal tempered optimism in the automotive industry and brought back the issue of alternative fuel technologies as well as the **average CO₂ emissions target of 95 g/km for 2020** on the agenda.

For two decades R&D programs at Original Equipment Manufacturers (OEM) and Tier-1 suppliers have been focusing on lightweight materials to decrease overall vehicle weight, integration of components, emission decreasing measures, hybrid and electric drive systems, as well as optimising production systems in cooperation with production systems’ suppliers. Although the market share of hybrid-electric vehicles in Europe in 2016 amounted 1.8% of all new car sales, **European automakers plan to focus on the deployment of plug-in hybrid electric vehicles on a larger scale by 2030**. In the meantime **China’s investment in electric mobility exceeds the sum of investments in Germany, France, USA, Japan and Korea together.** (EACN 2019)



Social trends

- Millennials focused on mobility rather than on owning cars
- Sharing economy
- Urbanisation and urban sprawl
- Aging population, less access to qualified employees, wages up
- Customisation, limited editions



Technological trends

- Industry 4.0, Smart Factories, Artificial Intelligence in advanced automated production systems
- Cyber-security (H2M, M2M)
- Connected cars, 5G networks
- Electric and hybrid drive systems
- Autonomous cars
- Lightweight materials



Economic trends

- Made in China 2025
- A shift of the middle class’ purchasing power value
- Trade wars, protectionism
- Data collection and processing as value creators
- Globalisation vs. regional concentration



Ecological and political trends

- Climate change
- Regulations on emissions
- Circular economy
- Growing interdependence
- Brexit
- European Union’s unity under pressure



(EACN 2019)

The Covid-19 pandemic that hits the world and Europe in early 2020 adds additional pressure to the automotive industry.

With the pandemic outbreak in diverse regions of the world, the global supply chain built up by the automotive industry in the past decades met first obstacles when parts needed to produce cars in Europe were not delivered in time. The **full breakdown of production and sales channels led to a decrease of car registrations in EU+UK of 39.3% for the first four month of 2020 compared to the same period of 2019**, and of 78.9% for the only month of April (ACEA 19/05/2020).

Nearly **half of the directly employed people** in car, truck, van and bus production **suffer from Covid-19 impacts** with an even higher part expected for the remaining automotive supply chain (ACEA 20/04/2020).

The **impact on companies**, especially on the viability of Tier-2 and Tier-3 actors, **is huge**, with low margins and reserve assets from the past, no incomes and ongoing costs. But no European statistics are

known today. **Financial difficulties and bankruptcies will lead to further disruptions of local and regional supply chains.**

Resumption of production and vehicle sales need additional sanitary and safety efforts especially in shop floors and showrooms, leading to additional costs with a high risk of people postponing new car purchases while waiting to know how they will be affected personally.

The **European Union as well as national governments are setting up enormous support programmes**, some targeting the economy as a whole (e.g. EU, Poland, Germany, Spain), others directly the automotive sector (e.g. France).

Support programmes include e.g. direct funding and loans to companies or purchasing incentives. All **support programmes aim at strengthening the turn to more sustainable transport and mobility**

and thus **supporting the European Green Deal.**

EACN cluster experts expect that the **very negative impact** of in the close future **will still be visible in 10 years.**

Evaluation of Covid-19 impact on the market evolution

(26 cluster experts, survey from May 2020)



	Germany	France	Spain	Italy	UK	EU + UK
Not produced veh.*	616,591	278,425	452,155	159,336	250,792	2,435,824
Production stop	30	34	34	41	40	av.: 30
Car registrations						
• April 2020/2019	-61.1	-88.8	-96.5	-97.6	-97.3	-78.9
• Jan-April 2020/2019	-31.0	-48.0	-48.9	-50.7	-43.4	-39.3
Employment**	568,518	90,000	60,000	69,382	65,455	1,138,536

* including passenger cars, trucks, vans, buses and coaches ** employed by passenger cars, trucks, vans, buses and coaches OEMs

Source: ACEA

Two evolutions mainly influence the future mobility landscape with **millennials** rather **looking for functional mobility solutions** than owning their own car, and the **upcoming of digitisation allowing telework** and easy online collaboration.

The pandemic had a boosting effect on both evolutions. People experienced alternative transport means for daily travels, pushing e.g. the share of bicycle use from 2% to 6% and of walking from 5% to 8% in Germany, with a global decrease of traffic of 47% (MIB 2020). With live getting more normal, traffic will raise again probably without reaching pre-pandemic levels again.

This is due to the fact that many people that experienced telework and online meetings will maintain this functioning, disencumbering thereby especially peak hour traffic?

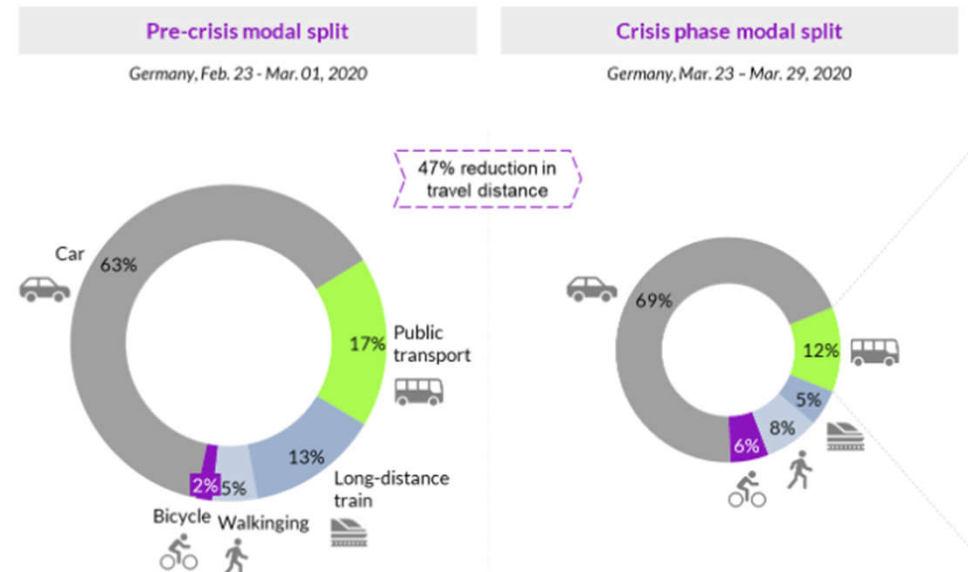
Cities still started redistributing space to pedestrians and cyclists and preparing more sustainable mobility solutions to maintain a higher air quality and thus quality of life of citizens.

Future mobility will be more intermodal, needing flexible and adapted vehicles and services, as well as continuous information for travellers. **Mobility as a Service (MaaS) will gain further importance.** Shared mobility systems such as car-sharing, ride-sharing or public transport will need regular (automatic) vehicle disinfection or air purifiers that can lead to new business. **Finding a viable economic business model will be a real challenge** for multiple mobility operators.

Thus, **EACN partners expect** future urban mobility to be characterised by

- **road traffic beneath pre-crisis level even in a long term;**
- **lasting significantly higher shares of walking and cycling** for daily travels;
- **an increase of intermodal travels**, with a strong need for seamless information and ticketing (Mobility as a Service);
- **flexible and reactive mobility services** responding to volatile travel demands; and
- **new innovative business models** from mobility actors, including automotive industry.

Development of modal split in Germany from End of February to End of March 2020



EACN cluster experts see **two main triggers that will influence the vehicle design and technology**. The first trigger are **changing behaviours**, millennials looking for transport opportunities and open for intermodal travels including shared mobility offers. This will lead to less traffic but an intensified use of vehicles by people with less and irregular driving practice. Enhanced advanced driver assistance systems are thus necessary to ensure a very high safety level and to allow users reaching their destination.

The second trigger impacting future vehicles is **climate change** and the need for rapid deployment of low and zero emission mobility means, including cars. Battery and fuel cell electric and, in a transition period, hybrid powertrains are the vehicle contribution to emission reduction goals under condition that energy and hydrogen production and distribution are sustainable too. **Materials, production and supply chains must also contribute to minimise the ecological impact** of future vehicles.

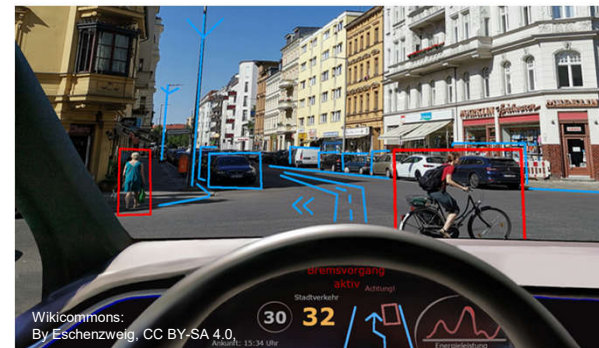
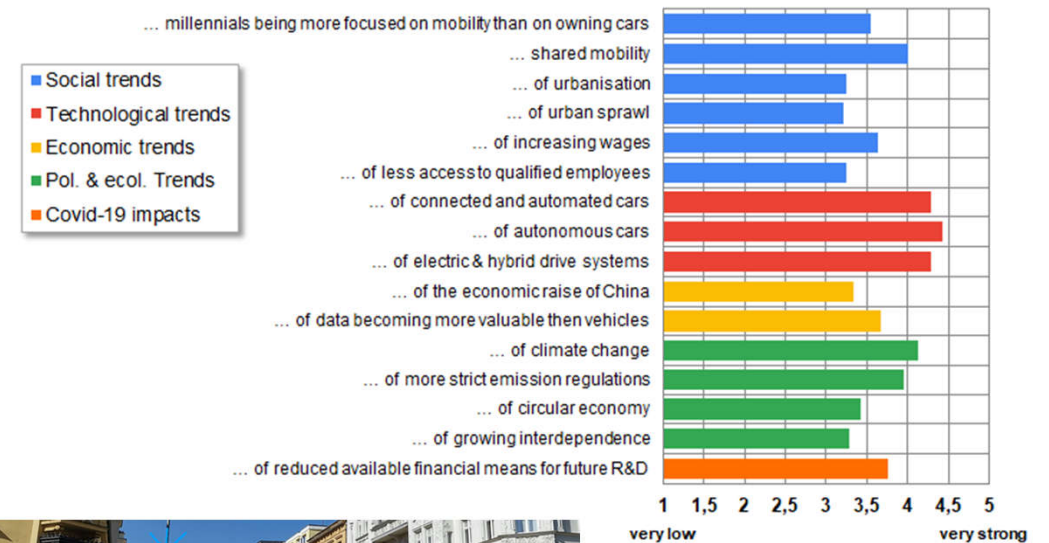
In a mid to long term, **automated and autonomous electric vehicles can further increase road safety and boost shared mobility services**. Automated and autonomous vehicles must impart trust to users. Using travel time useful needs connectivity and infotainment offers.

Therefore, **EACN partners suggest to**

- **focus** vehicle and infrastructure **developments on battery and fuel cell electric technologies**,
- develop vehicles well adapted to shared mobility with flexible usages,
- **vulgarise the use of enhanced advanced driver assistance systems**, especially in vehicles used for shared mobility, and
- develop a **safe and rapid V2V and V2I communication system**, invulnerable to cyber attacks.

Tendencies with an estimated strong impact on the vehicle

(average answer >3.2)



After more than 100 years of intensive engineering effort, the combustion engine is today a real technical marvel, and important progress has been made in the past decades to reduce consumption, emissions and improve security.

Nevertheless, environmental constraints, decreasing oil reserves and the strong dependency from oil producing countries makes it necessary to usher a **new mobility era with zero emission vehicles and a corresponding green energy production.**

Thus, the **future are battery and fuel cell electric vehicles.** A competitive European automotive industry must now invest in R&D and develop competitive and affordable electric vehicles. The electric powertrain will replace the combustion engine as key element of the car, and **competition in the future will be on battery capacities, power electronics, fuel cell technology** and further use of lightweight materials without reducing passenger safety.

This will **impact the classic business model and the functioning of OEMs** and suppliers. The development of electric vehicles and the electric powertrain need competences such as electric and electronic engineers, chemist but also strong IT competences to steer the vehicle and to prepare connectivity and self-driving while considering protocols, safety or cybersecurity issues.

EACN partners suggest to

- **massively increase R&D efforts and rapidly deploy zero emission vehicles** despite negative financial Covid-19 impacts,
- **re-train employees** and hire new experts,
- intensify, in cooperation, **R&D and industrialisation activities for high energy batteries 'Made in Europe'**,
- prepare the **production of core technological elements** (batteries, power electronic...) in Europe,
- adapt study programmes to fit future needs for competences, and
- **develop massively electric and hydrogen charging infrastructures** using public and private funding



Photo by Karsten Würth / unsplash.com



Photo Solaris Bus

In 2018, the European automotive industry invested €57.4 bn in R&D (ACEA 08/06/2020). It is within the top 5 innovative industries with a steady rise of patents over the last 10 years that reached 9,635 patents in Europe in 2019 (EPO 2020). Over half of all automotive patents were granted to the EU industry in 2018 (ACEA 08/06/2020). But there is too a growing competitiveness especially with the ICT sector that already totalled 32.8% of patents related to self-driving vehicles in 2017 (EPO 2018).

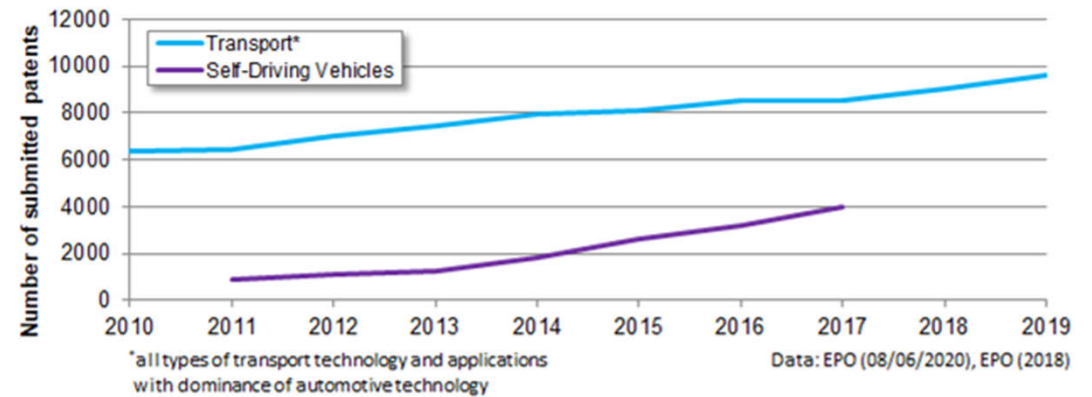
Innovation is done despite a difficult environment that is characterised by R&D needs to fulfil EURO 6 and 7 standards, a missing clear position of OEMs and politics on one or two viable alternative powertrain technologies, and a strong general financial pressure on the sector in the past. This situation leads to a dispersion of R&D funds with still a majority invested in traditional ICE technology and still a missing consequent strategy, budget and effort dedicated to the development of future zero emission vehicles, to core technologies and to industrialisation.

The challenges remain even after the Covid-19 pandemic heavily impacted Europe. Pressure from politics and customers even raise, and a rapid adaptation of the European automotive industry is crucial for their survival.

To avoid that losses in vehicles sales lead to reduced or delayed R&D investments in the next years, EACN partners suggest to

- focus on battery electric vehicles (very short term) and on Fuel cell electric vehicles (short and mid-term), especially for intensive and long distance usages,
- prioritise a very strong support for R&D and industrial modernisation instead of purchasing primes,
- prioritise fixed quotas for zero emission shares of vehicle sales for all OEMs known over a long term to further tightening of emission standards, and
- push the development of highly automated zero emission vehicles as basis for future new mobility services allowing reducing traffic at a whole.

Evolution of transport related patents in Europe 2010 - 2019



Main applicant groups for SDV patent applications at the EPO and their technology profiles 2011-2017

	Automotive	Other transport	Machinery & electrical equipment	Telecom	ICT for automotive	Other
Perception, analysis & decision	44.4%	9.9%	13.6%	4.2%	23.8%	4.2%
Computing	33.6%	7.6%	14.4%	9.1%	30.4%	4.9%
Vehicle handling	63.4%	4.6%	15.8%	2.2%	10.8%	3.3%
Communication	18.5%	3.6%	6.9%	25.1%	42.6%	3.3%
Smart logistics	48.7%	7.0%	19.6%	5.1%	15.4%	4.1%

Source: EPO

The patent statistics in this table are based on patent applications filed at the EPO in SDV technologies. They do not include patent applications filed with the national offices of the EPC contracting states. The reference date for each application is the filing date at the EPO. (EPO 2018)

Today, mobility is mainly characterised by diesel and petrol propelled road vehicles. It represents about 30% of the European final energy consumption and about 25% of European GHG emissions. **Transport is the only sector that does not yet improve its figures compared to 1990** (EC 2019).

On 19 December 2019, the new president of the European Commission Ursula von der Leyen announced the European Green Deal, a challenging programme aiming at cutting emissions, creating jobs and opening up new opportunities in a fair way (EU 19/12/2019). In April 2020, she confirmed Europe's vision and the role of the European Green Deal in the post-pandemic economic recovery (EU 20/04/2020).

Some countries, e.g. France (RF 26/05/2020), also **link their recovery plans** for the automotive industry to **sustainability goals**, aiming at helping companies not just surviving the crisis but in the same time preparing the long term future.

European OEMs must increase their consideration of climate goals if they

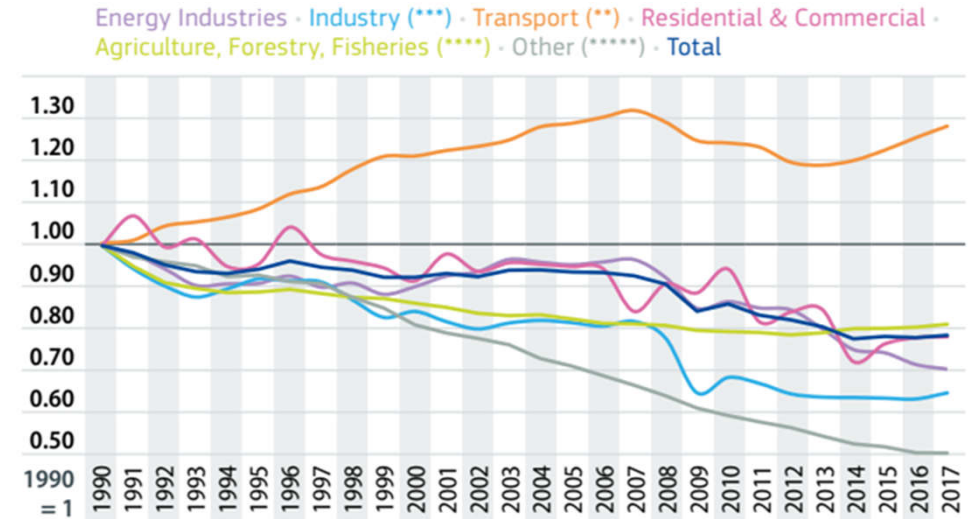
want to maintain their leading places in the global automotive world.

Thus, **the future** of the European automotive ecosystem **resides in social and ecological responsible companies** with sustainable products and productions. **These companies** care for their personal, **focus on short circuits for the provision of parts and intellectual services**, and provide products and services that are ecological, safe and attractive while being produced with a minimum of materials and energy consumption.

EACN partners suggest to

- not forget that climate change will have a much stronger whilst less disruptive impact on civilisation in a long term than the pandemic had,
- focus R&D and investments on battery and fuel cell electric vehicles and corresponding green energy and hydrogen production and distribution;
- Minimise the global ecological impact of the automotive industry (products, production, supply chain, waste reduction, recycling; buildings);

GHG emissions (*) by Sector – EU-28 – Mt CO2 Equivalent



The Economist (23/04/2020),

Notes: (*) Excluding LULUCF (Land Use, Land-Use Change and Forestry) emissions and international maritime, including international aviation and indirect CO₂.
 (**) Excluding international maritime (international traffic departing from the EU), including international aviation.
 (***) Emissions from Manufacturing and Construction, Industrial Processes and Product Use.
 (****) Emissions from Fuel Combustion and other Emissions from Agriculture.
 (*****) Emissions from Fuel Combustion in Other (Not elsewhere specified), Fugitive Emissions from Fuels, Waste, Indirect CO₂ and Other.

EC European Commission (2019)

Future vehicles will be either part of important fleets of **shared mobility vehicles or highly customised ones**. Powertrains will be electric, with a **cohabitation of battery and fuel cell electric vehicles**. More and more advanced driver assistance systems (ADAS) make cars sensor equipped technology platforms on wheels.

To respond to customers' demands, the automotive industry must enable **cost optimised supply chains and production**, that are at the same time **fast, flexible, intelligent and elastic**.

Only digitisation and automatisaton of the whole value chain, from the OEM to the last supplier, **can guarantee the competitiveness** of the European automotive industry. Digitisation and automatisaton allow companies minimising energy, material use and waste while employing better and differently skilled people.

Industrial modernisation as well as electric powertrain development and production,

constrain companies to train employees and look for different competences than in the past. The whole **educational system must also adapt to this new situation**.

The value chain is only as strong as the weakest element. That means, even **suppliers behind the Tier-1 must be integrated in the digitised supply chains** and be enabled to modernise their production. Thus, Tier-2 and below need to get sufficient margins allowing them to invest in industrial modernisation and to build a very strong European automotive landscape. As suppliers are often collaborating with different Tier-1 and OEMs, **standardised interfaces for the whole ecosystem** will be very useful to **minimise investment and operational costs** for software solutions.

Increased and simplified Investment and R&D support are needed to enable especially SMEs to join the process of digitisation and automatisaton.



Photo by Lenny Kuhne / unsplash.com

Today, the automotive industry figures within the most globally organised economic sectors in the world. Alliances and coopération between OEMs, production sites all around the world, And suppliers settling close to their customers.

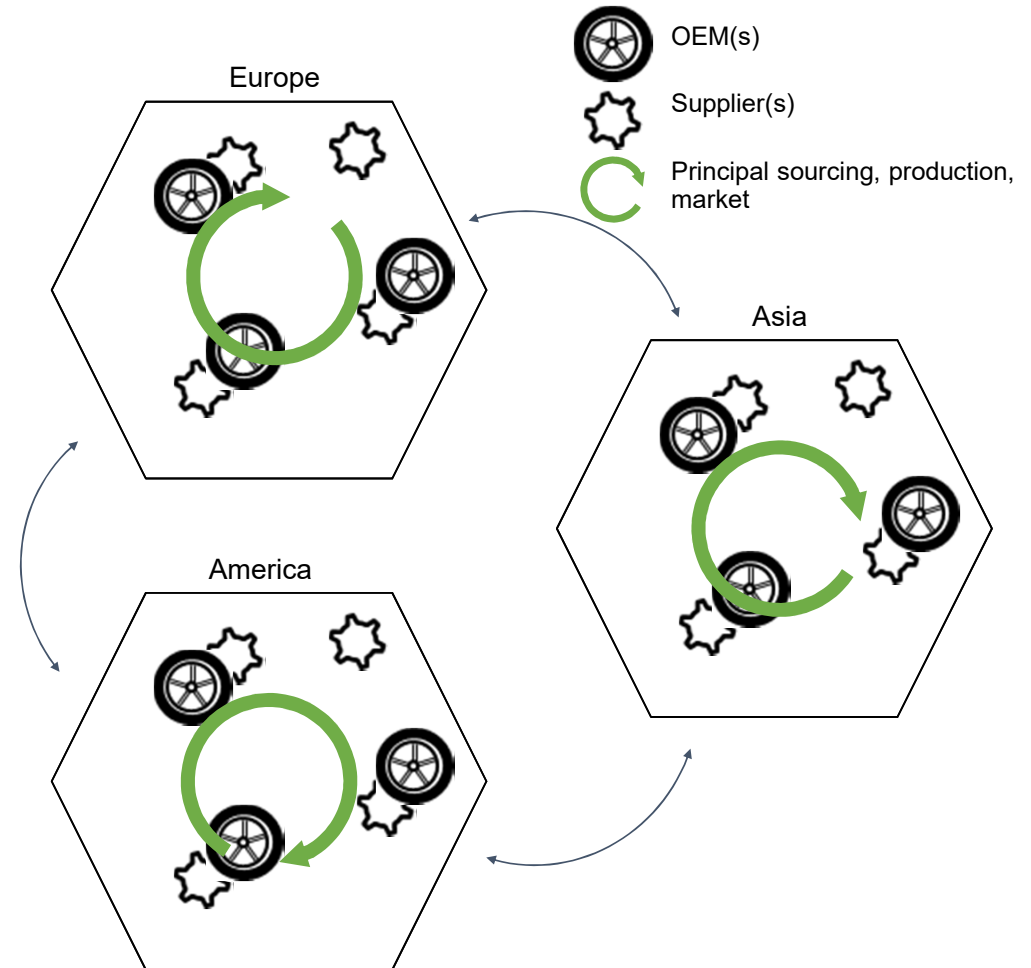
Productions sites are specialised in building only one or several models that are then shipped to global markets. Also, **parts are produced where the lowest costs are found**, creating concentrations in some regions and especially in China and Asia. The **global supply chain depends heavily on some local productions and on functioning transport chains.**

The **pandemic has shown the weaknesses of this global organisation** when plants started to closed in Asia and parts where being missing or delivered with delay. **Considering an increased risk of future supply chain failures gets much more important.** Therefore, there is a need to rethink current structures aiming at avoiding dependency on one country or region. **Redundant supply chains with full production capacities can be a solution.**

Breaking back to pure national strategies is on the other hand no solution. **Strategies and organisation shall consider major world regional clusters** (Europe, Asia, US) that are functioning similar to circular economy and target their regional market.

That means that there is a **need for a European approach** and not for 27 national ones. There is a **need to strengthen intra-European cooperation and value chains.** Local to European sourcing must be top priority depending on the complexity, added value and criticality of parts and services. Enhanced intra-European collaboration in R&D will furthermore strengthen the European automotive industry.

New production methods and industrial modernisation of all actors of the automotive value chain, together with a **rapid adaptation to new powertrains and related core technologies, are also key to build up a strong and competitive European automotive industry** able to satisfy



Founded in late 2017, the **European Automotive Cluster Network EACN** brings together today **19 automotive clusters** from **10 European and international countries**.

The **EACN clusters total more than 2,800 members** and federate the triptyque of companies, of which most are SMEs, research and education, combined with very strong relations to public authorities, territorial development agencies and funding organisations.

EACN members aim at cooperating in the field of industrial modernisation of the members to face the automotive industry's challenges and to help them strengthening their position on future markets and in future value chains. EACN members identified the four "P's" Product, Production, Process and People as main working areas.

Six EACN members are currently cooperating on the EACN for Joint Industrial Modernisation Investment project, co-funded under the COSME programme of the European Union.

EACN's Strategic activity fields

Product

- New technologies (lightweight materials, alternative powertrains, advanced transmission...)
- New vehicle concepts (esp. EV-concepts, autonomous vehicles)

Production

- Additive manufacturing
- Supply Chain optimization
- Responsive maintenance

Process

- Digitalisation, Internet of things
- New and innovative production tools

People

- Working environment, training/ education, skills 4.0 and re-talenting to meet the skills gap, ...

Contact: European Automotive Cluster Network EACN

% Pôle Véhicule du Futur
Thomas Röhr, tr@vehiculedefutur.com
www.eacn-initiative.eu

