WHAT’S NEXT FOR THE EUROPEAN AUTOMOBILE INDUSTRY AND JOBS

THE EUROPEAN GREEN DEAL AND JUST TRANSITION: COAL, CARS AND THE WORLD OF WORK

BRUSSELS

21 JANUARY 2020
TROUBLED WATERS AHEAD

- Highly cyclical industry
- End of the post-crisis boom
- Strong export dependency
- Massive reconfiguration over the past decade
  - Market
  - Industry

Cycles of boom and bust and the European passenger car market

- The financial crisis
- Oil shock
- Crisis of the early 1990s
- Crisis of the early 1980s
- "toxic shock" of the 2000s
- Eurozone crisis
- 2017/18: post-crisis peak
IN WESTERN EUROPE, FRANCE HAS BEEN AMONG THE LOSERS IN TERMS OF BOTH PRODUCTION VOLUMES AND EMPLOYMENT.
TECHNOLOGICAL CHANGE: A LIFE-OR-DEATH QUESTION

- Unprecedented spending in automotive R&D.
  - Vital opportunities
  - Fatal risks

- High costs incurred by technological development.
  - Huge financial pressure pushing companies to scale up.
  - Uncertain returns.
  - Shrinking profitability

- A threefold transformation
  - Electrified powertrains
  - Connected and autonomous vehicles
  - Digitalization across the value chain

![R&D spending of EU companies (bn €, consolidated top 1000 companies)](chart)
HIGH UNCERTAINTY PREVAILING

- High variability of medium- and long-term market forecasts.

- Regulation push
  - Huge financial penalties for manufacturers in case of slowdown of EV transition.

- Market uncertainties
  - Battery and vehicle pricing
  - Infrastructure availability

- Industry uncertainties
  - China
  - Battery manufacturing
  - Value chain reconfiguration
  - Restructuring

Variability of market forecasts for 2030 in Europe

- Ricardo: 56% (Pure electric), 71% (Hybrid), 59% (Combustion)
- European Climate Foundation: 40% (Pure electric), 20% (Hybrid), 50% (Combustion)
- Continental: 24% (Pure electric), 19% (Hybrid), 22% (Combustion)
- European Commission: 30% (Pure electric), 20% (Hybrid), 50% (Combustion)
- ELAB Scenario 2: 20% (Pure electric), 40% (Hybrid), 40% (Combustion)
ELECTRIFICATION INVOLVES MASSIVE CHANGES FOR THE POWERTRAIN INDUSTRY

Estimated employment impact in France

- Electric & electronic systems: +4500
- Battery: +350
- EV R&D: +200
- Remanufacturing: -600
- Filtration, exhaust treatment systems: -3300
- Transmission parts: -3600
- Engine control: -3800
- Parts: -5800
- Engine foundry: -6500
- R&D: -8800
- Engine assembly: -18500

Minus 20-30% of current employment levels expected for France by 2025 (10-15k jobs lost)

Figure 14: The value chain of an electric vehicle

More added value:
- Electric charger
- Controller
- Electrical wiring
- ECU
- Electrical distribution
- Electronics
- Battery
- Electrical motor
- Converter
- Inverter
- PWT battery cooling
- Recharging interface

Disappeared:
- Fuel Tank
- Gearbox
- Combustion engine
- Fuel system
- Turbo
- Exhaust system
- Emission control
- Air filter

Less added value:
- Transmission
- Engine cooling

Note: The ECU (engine control unit) manages the fuel injection in an ICE system.
Source: Syndex.
### Table 1: Powertrain employment impacts: diverse and contradictory dynamics

<table>
<thead>
<tr>
<th>Production</th>
<th>R&amp;D</th>
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<tbody>
<tr>
<td><strong>Today</strong></td>
<td></td>
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<tr>
<td>Implementation of EURO 6d-temp – new equipment;</td>
<td>A lot of work for powertrain teams (test + norms adaptations)</td>
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<td>Limited hybrid impacts on assembly activities (but complexity, intensity of work)</td>
<td>Mobility (diesel/ gasoline), diesel decline</td>
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<td>Limited volumes of BEV, low productivity</td>
<td>Emergence of EV/FCEV teams + adaptation of all the vehicle functions to an electrical architecture</td>
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<td>More Gasoline/Less Diesel Volumes</td>
<td>Diversified powertrain solutions (Full electric, Hyridized, Thermal)</td>
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<td>Divestiture (volunteer departure; partnerships; externalisations...)</td>
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<td><strong>After 2021</strong></td>
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<td>More BEV volumes</td>
<td>Decline of ICE projects</td>
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<td>Depends on the speed of electrification and the share of hydrids (MHEV, PHEV, FHEV)</td>
<td>More EV/FCEV projects</td>
</tr>
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<td>Depends on the battery production contribution</td>
<td>New R&amp;D domain (next generation of battery, quantum computing...)</td>
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<td>New strategic suppliers (batteries), but shorter supply chain</td>
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</table>

What will happen to ICE teams? Different technical competencies between EV and ICE powertrains: potential for mobility? In which conditions?
UNEVEN EMPLOYMENT
IMPACT OF EV TRANSITION

- Short-/medium-term vs. long-term impact
- Automotive vs. overall employment
- Powertrain vs. other automotive activities
- Western vs. Central and Eastern Europe
- Electrification is not the only technological change affecting employment

Number of automotive FTE employees by region

Source: DG Growth cluster mapping tool.