Czech Automotive Industry in Transition

Potential Job Impacts of Electromobility in the Next Decade

PRAGUE, OCTOBER 12TH, 2022
How will the # of Jobs in the Automotive Industry change until 2030?
330K jobs in automotive spread across eight industries

Number of employees (2019, in thousands)

Core automotive
- Total: 330
  - OEMs: 43
  - ICE-focused suppliers: 31
  - ICE-unfocused suppliers: 198
  - Maintenance and Repair: 36

Adjacent industries
- Equipment & Services: 16
- Energy production: 1
- Energy infrastructure: 1
- Recycling: 5
6

Trends impact employment in considered industries

<table>
<thead>
<tr>
<th>Category</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market volume</td>
<td>Yearly sales decrease(^1)</td>
</tr>
<tr>
<td></td>
<td>Yearly production decrease(^1)</td>
</tr>
<tr>
<td></td>
<td>Yearly car parc increase(^1)</td>
</tr>
<tr>
<td>Technology evolution</td>
<td>Yearly increase in software value per car</td>
</tr>
<tr>
<td></td>
<td>Yearly increase in content per car</td>
</tr>
<tr>
<td>Product mix</td>
<td>Increase in overall car portfolio</td>
</tr>
<tr>
<td>Productivity gains</td>
<td>Average yearly productivity increase</td>
</tr>
<tr>
<td>Shift to EV</td>
<td>2030 BEV production share</td>
</tr>
<tr>
<td></td>
<td>High value-add in battery production</td>
</tr>
<tr>
<td>Job On- / offshoring</td>
<td>On- (+) / offshoring (-) of jobs (p.a.)</td>
</tr>
</tbody>
</table>

1. 2019 as baseline year
Source: IHS Markit; BCG

Positive impact on job demand
Negative impact on job demand
No impact on job demand
Overall positive impact, shift to EV with big transitions

Job losses and job gains (in thousands) due to various trends

<table>
<thead>
<tr>
<th>Trends</th>
<th>2020</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market volume</td>
<td>330</td>
<td></td>
</tr>
<tr>
<td>Technology evolution</td>
<td>-25</td>
<td></td>
</tr>
<tr>
<td>Product mix</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Productivity gains</td>
<td>-6</td>
<td></td>
</tr>
<tr>
<td>Shift to EV</td>
<td>43</td>
<td>14</td>
</tr>
<tr>
<td>Job onshoring</td>
<td></td>
<td>335</td>
</tr>
</tbody>
</table>

Job losses and job gains (in thousands):
- Market volume: -25
- Technology evolution: 2
- Product mix: 21
- Productivity gains: -6
- Shift to EV: 43
- Job onshoring: 14
Declining development in core, upside in adjacent industry

Job losses and job gains (in thousands) across different industries

Core automotive

- **OEMs**: -25% (-11)
- **ICE-focused suppliers**: -45% (-14)
- **ICE-unfocused suppliers**: 8% (+17)
- **Maintenance and Repair**: 11% (+4)

Adjacent industries

- **Equipment & Services**: 4% (+1)
- **Energy production**: 147% (+2)
- **Energy infrastructure**: 662% (+6)
- **Recycling**: 10% (+0)

2020: 330

2030: 335

Strong reduction in production due to lower labor content in BEVs

Strong downsizing in all areas due to falling demand from components

Expansion in all areas, particularly driven by cell production facilities

Modest increase due to slightly increasing and aging car parc

Slight build-up through rebuilding in factories of OEMs and suppliers

Build-up due to increasing capacities and higher share of renewable energies

Increase for the production, installation and operation of charging infrastructure

Remains stable as service life of electric cars is longer than the period under review
Transition of job positions in 3 perspectives

1. Transition over time
   - Pre-COVID level of ~330k jobs reached by 2030

2. Transition between industries & job families
   - 70k jobs to be shifted to & from industry clusters in Auto & adjacent industries

3. Transition across regions
   - Job growth in Czech Rep. expected, slight decline in most of Europe
Employee demand with fluctuations until 2030

Total of job development 2010 - 2030 in the Czech Republic [in million]

Key characteristics 2020-30

- Return to previous growth trajectory by end of decade
- Recovery from COVID setback expected until ~2023
- Consolidation phase 2025-27 due to total volume decline

Transition over time

Pre-COVID level regained by end of this decade

Governmental compensation programs to stabilize employment

COVID setback

Consolidation phase

Key drivers:
- Decline in production volume
- Decline in sales volume
- Decline in number of car platforms

Source: BCG
155K positions with dedicated training needs

<table>
<thead>
<tr>
<th>Situation</th>
<th>Same job profile</th>
<th>Similar job profile</th>
<th>New job profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remaining in the company and profession with slightly different requirements</td>
<td>On-the-job training required</td>
<td>Retraining and relocation necessary</td>
<td>Change to other industry and / or new job profile</td>
</tr>
<tr>
<td>Affected positions</td>
<td>~85k</td>
<td>~40k</td>
<td>~30k</td>
</tr>
<tr>
<td>Example</td>
<td>Employee final assembly automotive OEM</td>
<td>Employee gearbox production to electric motor assembly</td>
<td>Employee battery cell production</td>
</tr>
</tbody>
</table>
Czech Rep. with slight increase, withstands overall trend

Regional distribution of jobs across Europe [in M]

Europe

- 2019: 5.7
- 2030: 5.6
- Change: -36k (-1%)

Germany

- 2019: 1.7
- 2030: 1.7
- Change: +25k (+2%)

Poland

- 2019: 0.4
- 2030: 0.4
- Change: -7k (-2%)

Spain

- 2019: 0.3
- 2030: 0.3
- Change: -29k (-8%)

Czech Republic

- 2019: 0.3
- 2030: 0.3
- Change: +5k (+2%)

Limited transitions across European countries due to personal & cultural barriers
Push vehicle electrification towards ambitious scenario ...

The Base-Case is not a "per default"-scenario, measures need to be undertaken to achieve it

Czech Republic in competition with other countries, especially in Eastern Europe

The government is the responsible driver for the domestic market conditions

Follow National Action Plan of Clean Mobility and even tighten targets

Stimulate domestic e-mobility market by governmental incentives

Tools by the government can comprise monetary to structural measures

Source: BCG Analysis

... as impact on jobs is highly dependent

Job impact per scenario [# (%) by 2030 vs. 2019]

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Change</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Case</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Optimistic Scenario</td>
<td>+5k</td>
<td>+2%</td>
</tr>
<tr>
<td>Pessimistic Scenario</td>
<td>-15k</td>
<td>-5%</td>
</tr>
<tr>
<td>Ambitious Scenario</td>
<td>+25k</td>
<td>+8%</td>
</tr>
</tbody>
</table>
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