UNIVERSITÄT OSNABRÜCK

The Dual Transformation and Workplace Innovation

The Case of the German Automotive Industry

Prof. Dr. Hajo Holst
University of Osnabrück
EUWIN Webinar
Jan 26th, 2024

Content

- **The Starting Point**: workplace innovation in the German automotive industry
- **The Dual Transformation**: greening and digitalization as fundamental challenges
- **Case Studies**: car maker and mass supplier
- **Conclusions:** polarization of the transformation risks – and of workplace innovation

- Automotive as the **Stronghold of German Co-Determination**: cooperative management-worker relationships in OEM and large supppliers (based on high union density)
- From the 1990s: Introduction of **Participatory Lean Production** semi-autonomous teamwork and toyota production system (TPS)
- Objectives: **job quality *and* economic efficiency**
  - Qualification of workers
  - Job enlargement (rotation within team)
  - Job enrichment (maintenance, planning, indirect tasks)
  - Participaton of shopfloor workers in Workplace Innocation

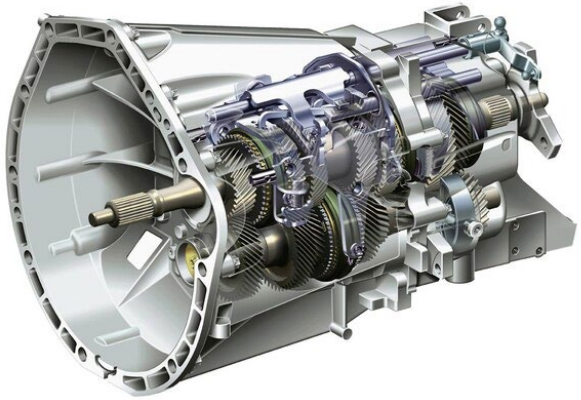
- **Carbon-based automobility** as a major source of carbon emisssions:
  Increasing fuel efficiency, bigger cars (SUV) and growing markets

- Germany‘s automotive sector is particular **dependent on carbon-based mobility**:
  OEM: combustion engine as primary smarker of competitiveness
  German Economy: large share of industrial employment in automotive powertrain

- **E-Mobility as the Primary Path towards Sustainability**:
  New products, new supply chains, new qualifications

- Digitalization as a **Parallel Transformation**:
  digitalization of products and digitalization of production

- **Case Study: Transformation Project in an OEM plant** (internal supplier for gearboxes and axles): initiated by works council, implementation with close cooperation between management and works council
  - ***Product*** Change: outsourcing of gearbox production, replacement by bodywork (a new product type for the plant), involving 400 workers
  - ***Production Change***: new, highly automated and digitized production line (including IoT for problem solving and predictive maintenance)
  - ***Qualification***: intensive re-training for 400 workers (from turnery, assembly, logistics)
  - ***Continuity of Participatory Lean Production***: teamwork as a source of workplace innovation in new production lines (job enrichment, job enlargement, worker participation)!
  - ***Complex Staffing Planning*** (motivating and qualifying people for new jobs)

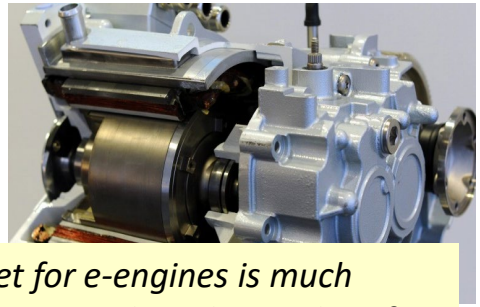


✓ **Objectives**: Supporting the dual transformation by (a) decreasing the plant‘s dependency on carbon-mobility, (b) securing employment and (c) continuing focus on workplace innovation!

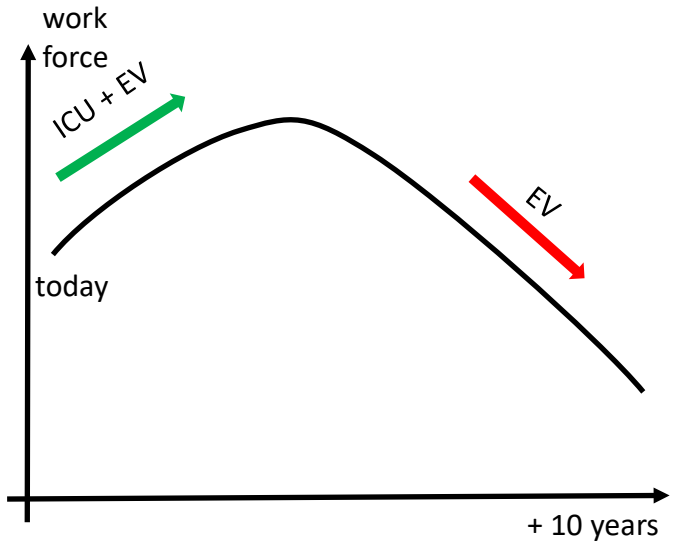
- **Case Study: E-Engine by 1st tier supplier** (plant traditionally embedded in ICU powertrain production).
  - ***New Product***: E-Engine requires new engineerial competencies in R&D (electical angineers), and new competencies in the assembly line (voltage)
  - ***Production Change***: new, highly automated and digitized production line (including IoT for problem solving and predictive maintenance) (less workers than in older productions)
  - ***Qualification***: some re-training for 40 workers (from different areas), electrical qualification only for a minority of workers
  - ***Complex Staffing Planning*** (parallel production of old and new products). Temporary agency workers to cope with temporarily increased staff demand (challenge is a qualitative one!)
  - ***Participatory Lean Production*** under pressure (increasing automation and use of temporary agency work)

✓ **Objectives**: Building competencies and production capacity for e-mobility

✓ **Challenges**: New products require big investments in R&D and production facilities, but market competition is much more intensive and margins are smaller (compared to old carbon-related products)!



„The market for e-engines is much more competitive than the markets for shocks or gearboxes. More competitors, much lower margins. But there is not alternative. If you do not start production für e-mobility now you will be out of the auto industry in some years.“ (Plant Manager)



- **Case Study: Lower Tier Supplier**
  (traditionally mass production of parts used in ICU/ carbon powertrain such as shanks, shocks and bearings).
  - ***Product***: concentration on traditional products (currently high demand and high margins), lack of capital blocks investments in production for e-mobility
  - ***Production***: old production facilities, low investment in maintenance (hight profits)
  - ***Qualification***: no-qualification strategy
  - ***Staffing***: Empty positions are filled with temporary agency workers (to increase the quantitative adaptivity of the workforce)
  - ***No focus on workplace innovation***

✓ **Objectives**: Producing as long as ICU cars are sold

✓ **Challenges**: No perspective beyond ICU vehicles, shrinking employment numbers, no focus on quality of work

„We are riding the horse until it is dead.“
(Plant Manager)

- **Challenges for German Car Makers and Large Suppliers**: transformation to e-mobility in European plants *with* the existing workforce
  - ***Commitment to the existing Workforce*** (supported by high union density and German co-determination)
  - ***Huge Investments in new technologies and qualification*** (productions lines, qualifying workers for e-mobility)
  - ***Parallel ‚old' and ‚new' productions*** (carbon-related and e-mobility-related products)
  - ***Complex Staffing Planning*** (supporting old products until final day of production, and supporting ramp-up of new products)

- **Challenges for Smaller Suppliers**: transformation as a do-or-die!
  - ***Lack of capital*** impeding investments in new technologies
  - ***Intensified Competition in E-Products*** decreasing returns on investments
  - ***A Product Portfolio heavily based on Carbon-Mobility*** increasing transformation risks

- **OEM and Large Suppliers: Continuity of Workplace Innovation in the Dual Transformation**
  - Commitment to Workers and Particpatory Lean Production in the Dual Transformation
  - High Investments in Research & Develeopment and New Product Lines
  - Reducing Transformation Risks by Restructuring Product Portfolio

- **Smaller Suppliers: Dual Transformation puts Workplace Innovation under Pressure!**
  - Traditionally less Focus on Workplace Innovation in Smaller Suppliers
  - Lack of Capital and Intensified Competition
  - Concentration of Transformation Risks as OEM increasingly outsource Carbon-related Products

- **Polarization of Workplace Innovation in the Dual Transformation?**
  There is a need for Public Support for Qualification and Worker Participation though Industrial Policy!