Electrification and digitalisation in
Baden-Württemberg’s automotive sector

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Economic Key-Facts Baden-Württemberg

- Located in the Southwest of Germany
- Neighbouring countries/states: Switzerland, France, Bavaria
- 11.2 million inhabitants live in Baden-Württemberg
- High industrial density
- GDP in 2022: 573 bn Euro (14 % of German GDP)
- Most important sectors in turnover and number of employees:
  - Automotive
  - Mechanical Engineering
- Further key-sectors:
  - ICT
  - Environmental Technologies incl. renewable energies
  - Healthcare
- Home to global players like Mercedes-Benz, Porsche, Bosch, Trumpf, SAP
- However: most companies are SME’s
- Strong international activities, no matter if SME or global player
Automotive sector in Baden-Württemberg

Major industrial sector and source of innovation

- more than 130 years of automotive engineering
- three large OEMs: Mercedes-Benz, Porsche, Audi
- more than 1000 suppliers
- 25% of German automotive production
- 6% of active population employed in automotive sector
- approx. 470,000 people contribute to the automotive industry
- Automotive sector with the highest export share in BW: 55.3 billion Euro in 2022

Source: Own depiction based on Strukturstudie BW® mobil 2019 and Statistisches Landesamt Baden-Württemberg
External and internal challenges of the automotive industry

Transformations in and around the vehicle meet with reorganisation of supply relationships

- Local for local
- Automation
- Electrification
- Digitalisation

Own representation; image sources: Fotolia/Sergey Nivens, shutterstock/metamorworks, iStock/Bosca78, Fotolia/Edelweiss
Major initiatives in Baden-Württemberg

- Founded in 2010 by the State of BW
- Create an independent competence centre & innovation agency for new mobility solutions
- Strengthen and promote BW as business and technology location for new mobility solutions
- Reaction to disruptive changes and climate change
- 100% publicly financed, BW is our only shareholder

www.e-mobilbw.de
Future mobility solutions
A systemic approach

Renewable energy source:
- Electricity
  - Charging station
    - DC/AC
    - conductive/inductive
- Hydrogen
  - Filling station
    - 350/700 bar
- Gas/Synthetic Fuels
  - Filling station
    - CNG/LNG/SNG
    - present infrastructure

Users and goods:
- digital lifestyle
- internet of things

Vehicle interfaces:
- electric
- automation
- vehicle concepts

Urban living:
- smart home
- smart infrastructure
- smart city

Further vehicle:
- sharing-concepts
- intermodality
- logistics concepts
- fleet management

Traffic system:
- holistic optimization
- Networking public transport
- Car2X communication

Source: Fraunhofer IAO, Systemanalyse BW® mobil 2013
Strategic Dialogue for the Automotive Sector BW

Managing the transformation process

Key objectives: climate protection – value creation – jobs

State level steering and coordination: political steering group, inter-ministerial working group, SDA offices (State Ministry – mobil BW)

Vehicles
- R&D, production, supply chain, software, value, suppliers, alternative drives, logistics

Energy
- Grids, infrastructure, renewable energy, transport, logistics, changing infrastructure, electricity, biogas, synthetic fuels

Data
- Digital infrastructures, platforms, data and analytics, IT security, CASE, Connected, Autonomous, Sharing, Electric

Focus topic steering groups

- Vehicles: Ministry of Economic Affairs, Conexus, Mercedes-Benz Verkehr,
  Membership: ministries, partners from industry, academia and civil society

- Energy: Ministry of the Environment, Conexus, NetBW, Conexus
  Membership: ministries, partners from industry, academia and civil society

- Data: Ministry of Transport, Conexus, NetBW, Conexus
  Membership: ministries, partners from industry, academia and civil society

Agile working groups
- Management determined on mission-specific basis
- Development of strategies & policies

Focus topic steering groups

- Geared towards defined objectives and additional partners
- Implementation of strategies & recommendations for action, project & policy holding events
- Public relations and participatory formats for specific projects, policy areas
- Making use of measures: E/RoW/!
- CfP platform: Transformationvision BW platform, etc.
Intiatives of e-mobil BW

Strategic dialogue for the automotive sector

Information centre for the transformation of the automotive sector in Baden-Württemberg
Cluster Electric Mobility South-West
Strong partners for the industrialisation of electric mobility

200 members from the mobility environment in Baden-Württemberg

- Network connecting business, science and the public sector
- R&D projects for the industrialisation of electric mobility
- Knowledge transfer with seminars and studies
- Internationalisation through projects, matchmaking and delegation trips

Find our members: competence guide
Cluster Electric Mobility South-West

Membership structure

- small & medium-sized enterprises <250 employees: 42%
- large companies >1000 employees: 32%
- medium-sized enterprises >250 employees: 17%
- research institutions/universities: 9%

Get to know our members!
### Cluster Electric Mobility South-West

**Innovations in four strategic sectors**

<table>
<thead>
<tr>
<th>Vehicle</th>
<th>Energy</th>
<th>ICT</th>
<th>Production</th>
</tr>
</thead>
</table>
| • modular & autonomous vehicle concepts  
• innovative thermal management solutions  
• diagnostics & maintenance  
• battery, e-motor | • bidirectional charging  
• innovative energy systems  
• charging infrastructure for battery-electric trucks | • new mobility concepts & intermodality  
• digitalisation in vehicles and infrastructure  
• cybersecurity | • increasing efficiency in manufacturing  
• design and production concepts  
• circular economy & recycling |

| knowledge transfer | | training and continuing education | internationalisation |
Cluster Electric Mobility South-West

Cooperation: task forces and working groups

Commercial Vehicles

Automated and connected driving

Skilled workforce and qualification

E-motor production

Circular economy (battery, hydrogen technologies)

Internationalisation

Recycling of hydrogen technologies

Battery recycling

automated disassembly

You can find further information about the working groups here.
Cluster Fuel Cell BW & Platform H2BW

Expansion of hydrogen and fuel cell technology in Baden-Württemberg

- Cross-sectoral umbrella for hydrogen and fuel cell activities in the country
- Bundling of activities and networking of actors

Platform H2BW as the first step toward implementing the hydrogen roadmap:

- Initiation of joint research projects
- Search for R&D cooperation partners and suitable funding programs
- Cooperation with international partners and networks
- Participation in national and international events and trade fairs

Over 200 Partners

https://www.plattform-h2bw.de/
Platform H2BW

Cross-sectoral umbrella for activities in the area of hydrogen and fuel cell technology

Hydrogen supply and infrastructure

Entire value chain of hydrogen technology is relevant:
- Mobility
- Industry
- Buildings
- Power generation
- Hydrogen production, storage, and distribution

Technology

for industry, mobility, buildings, energy generation, storage, infrastructure in the form of production facilities, machines, vehicles, components, plants, system solutions, services, etc.

Research, skilled workers, qualification and social acceptance
Cluster Fuel Cell BW

Overview

216 partner

of hydrogen and fuel cell technology
from Baden-Württemberg

activities along the hydrogen value chain:
Cluster Fuel Cell BW

Tasks

Our cluster enables the exchange and knowledge transfer necessary to promote hydrogen and fuel cell technologies with Baden-Württemberg:

- Knowledge transfer
- Networking
- Information on available state subsidies
- Education and training
- Internationalization
- Public relations
## Current projects in the region

**Overview (extract of several projects)**

<table>
<thead>
<tr>
<th>Production</th>
<th>Scaling</th>
<th>Application</th>
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</thead>
<tbody>
<tr>
<td><strong>H2ORIZON / Zero Emission</strong></td>
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<tr>
<td>Large-scale production of green hydrogen and showcase for sector coupling</td>
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<td></td>
<td>16 Mio. € Federal State Funding</td>
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<td><strong>Model Region Green Hydrogen</strong></td>
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<tr>
<td>Showcase for sector coupling and application of hydrogen and fuel cell technologies in urban and rural areas</td>
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<tr>
<td>HyFIVE</td>
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<tr>
<td>H2 GeNeSiS</td>
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<td></td>
<td>47 Mio. € Federal State Funding &amp; EFRD-Funding</td>
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<td><strong>H2-Wyhlen real laboratory</strong></td>
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<tr>
<td>Production of hydrogen by means of electrolysis with green electricity from the neighbouring hydropower plant.</td>
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<td>13.5 Mio. € National Funding</td>
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<td><strong>HyFab &amp; HyFab-2</strong></td>
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<td>Fuel cell development platform: Industrialisation of fuel cell stack production</td>
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<td></td>
<td>18.3 Mio. € Federal State Funding</td>
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<td><strong>Future Programme Hydrogen BW</strong></td>
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<td>Over 20 projects to build a future-oriented and sustainable hydrogen economy</td>
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<tr>
<td></td>
<td>26.4 Mio. € Federal State Funding</td>
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<tr>
<td><strong>H2Rhein-Neckar &amp; H2Rivers</strong></td>
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<tr>
<td>Hydrogen in mobility: hydrogen production for fuel cell bus fleets including infrastructure</td>
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<tr>
<td><strong>Climate protection &amp; value creation through hydrogen</strong></td>
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<tr>
<td>Project start in January 2023: Building a hydrogen economy in the state by fostering innovation and investment</td>
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<td>around 20 Mio. € Federal State Funding</td>
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**Elektrolysis made in BW**

Technology transfer as "electrolysis showcase" for electrolysis production in Baden-Württemberg

- 5 Mio. € Federal State Funding
Information centre for the transformation of the automotive sector in BW

Supporting SME’s from the supplier sector and the motor industry in Baden-Württemberg

Knowledge and relevant information regarding technical and economic aspects of the transformation of the automotive industry.

Knowledge Data Base

Various networks and events relevant for the topics of transformation.

Networking

Initial consultation by the centre for the transformation Baden-Württemberg. Access to a consulting data base and information about consulting vouchers funded by the Ministry of Economic Affairs, Labour and Tourism.

Advice

Advanced Education & Training

Easy Access to data base containing information about advanced education and training.

The transformation process of the automotive industry can be advanced by using existing potentials in the context of cooperative projects in affected regions.
Cooperation Auvergne-Rhône-Alpes / e-mobil BW

overview of activities since 2010

- joint engagement in European network “Four Motors for Europe” since 2010
  - working group “Electric and Hydrogen Mobility” with clusters and innovation networks from Catalonia, Lombardy and Flanders (associated region)

- regular exchange between e-mobil BW and CARA since 2010

- MoU between e-mobil BW/Cluster Electric Mobility South-West and CARA (formerly: LUTB-RAAC) signed in October 2013

- delegation visits and conference/trade fair participations from both networks

- German-French Alliance for Innovative Mobility Solutions (AllFraTech), 2017-2021
  - including letter-of-intent on intensified cooperation

- hEVy Charge EU initiative (cross-border charging infrastructure for long-haul battery electric trucks)
Cooperation CARA / e-mobil BW

Perspectives for future cooperation

- Common initiatives
  - hEVy Charge EU initiative (cross-border charging infrastructure for long-haul battery electric trucks)
  - European Automotive Cluster Network (EACN)

- Cluster management
  - Regular exchange
  - Identifying common topics of interests

- Knowledge transfer & initiation of projects
  - Working groups
  - Workshops on funding calls
  - Trade fairs (Hannover Trade Fair, Battery Show Europe, Automotive Suppliers’ Day)
  - ClusterXchange programme/company visits
Bundled expertise from Baden-Württemberg

Competence Atlas of the Electromobility South-West and Fuel Cell BW Clusters

Competence Guide

Bundled expertise from Baden-Württemberg

The Competence Guide is a joint reference work of the Cluster Electromobility South-West and the Cluster Fuel Cell BW. It shows competencies in the business location Baden-Württemberg and supports the search for suitable cooperation partners.

Scan the QR code now and find cooperation partners from Baden-Württemberg with the Competence Guide!
Thank you!

www.e-mobilbw.de