

# CENTER OF EXPERTISE HYBRID & COMBUSTION SYSTEMS

## OUR EXPERTISE

**COE HYBRID & COMBUSTION SYSTEMS (HCS)**

**GLOBAL SOLUTIONS**

AKKA assists you with your derivative development projects  
AKKA supports you in all required fields for the development of new powertrains

<p><b>DESIGN &amp; VALIDATION</b> </p>	<p><b>EE &amp; TRANSMISSION INTEGRATION</b> </p>
<p><b>DIESEL ENGINE CALIBRATION</b> </p>	<p><b>GASOLINE ENGINE CALIBRATION</b> </p>

**COLLABORATIONS WITH**

Simulation & Validation

E-Mobility

Software & embedded solutions

## KEY FACTS

- 220 engineers in powertrain development
- Hybridization of combustion engines and transmissions
- Performance & emission development
- Operating strategy
- Lead application and derivatives for global market
- Turnkey development projects
- Supplier Management
- Access to engine and chassis dynamometers

## OUR ADDED VALUE

- We develop lead-technology vehicles (ready for series production) for our customers in all hybrid variants
- Vehicle derivatives from an existing lead variant in a short time - compliant with worldwide regulations
- All development competences in-house with one engineering partner from concept to operation and field supervision

Having all development competencies inhouse as one engineering partner, we offer you a holistic and customizable set of solutions to meet your needs and challenges in hybrid and combustion systems.

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## OUR PORTFOLIO

- Calibration & function development of AT & DCT transmissions
- Concept development & system integration in existing architectures
- Analysis of E/E system topology, network communication, functions
- OBD systems incl. hybrid specific monitors + homologation documents
- Adaption of engine & exhaust treatment for hybrid specific usage including:
  - Engine start & drivability / operating strategy
  - Thermo management / heating strategy of catalyst
- Component design, packaging, test planning, functional analysis
- Change & quality management
- Documentation & graphic creation
- Repair instructions & manuals

## SELECTED LIGHTHOUSE PROJECTS

**AKKA**  
PASSION FOR TECHNOLOGIES

### HYBRID POWERTRAIN DEVELOPMENT

FROM CONCEPT TO SERIES PRODUCTION

**HYBRID DEVELOPMENT FROM ONE SOURCE**  
High efficiency, enormous driving pleasure and low emissions at the same time make hybrid drives, especially the plug-in hybrid, the standard drive of the future. The high complexity of the drive system places the highest demands on engineering and requires a high level of component and system competence.

As a general contractor, AKKA offers individual stand-alone solutions as well as the complete development of hybrid drives, including development-related topics such as functional safety according to ISO 26262, high-voltage safety, quality, supplier and program management.

An experienced development team covers all areas of competence to complete the tasks from the initial idea to the end of production. Up to 200 employees can be deployed across departments to ensure the success of the project. In addition, in-house resources such as battery, e-machines and road to rig test benches ensure that project goals are achieved.

**OUR ADDED VALUE**

- As a leading engineering and service provider AKKA develops lead-technology vehicles for its customers
  - Micro-hybrid hybrids
  - Full hybrids
  - Plug-in hybrids
  - Battery- & charging-systems
- We take responsibility from the idea to SoP
  - All development competencies
  - In-house
  - Compliance in worldwide regulations
  - Development of lead powertrains especially for new technical concepts
  - Vehicle derives from an existing lead variant in a short time also in a large scale
  - One engineering partner from concept to operation and field supervision

Automotive | Aerospace | Hybrid | Energy | Life Sciences | Telecom | Space | Embedded Information Systems | Service | OTC ECU | Consulting

**AKKA**  
PASSION FOR TECHNOLOGIES

### TURBOCHARGER AND E-COMPRESSOR DEVELOPMENT

YOUR CHALLENGE IS OUR INCENTIVE

In both fields, conventional drive and e-drive, the usage of turbochargers (TC) and/or electrically powered compressors is growing. Nearly all OEMs and Tier1 are currently more and more focusing on this technology as one core technology for the further development of ICE (internal combustion engines) and for fuel cell systems. CO<sub>2</sub> reduction, fuel economy and the usage of renewable energy are main drivers for this technology.

AKKA is able to provide engineering services through the complete product development process.

**OUR ADDED VALUE**

With AKKA as one of Europe's leading development service providers we gain the following advantages for our customers:

- Full service provider
- Less interfaces
- Higher project efficiency
- Hands-on mentality
- Full understanding of the whole system and beyond
- Usage of state-of-the-art development tools and methods
- In-house testing on hot and cold gas test benches
  - Electrical-, functional-, and lifetime testing
- More than 20 years experience in TC development

We are ready for your demanding development projects!

Collection of TCs and impeller wheel

Automotive | Aerospace | Hybrid | Energy | Life Sciences | Telecom | Space | Embedded Information Systems | Service | OTC ECU | Consulting