



Driving electric cars into the fast lane

Philips Applied Technologies

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We're
with you
all the way

Looking for ways to extend battery service life? Need expert advice on how to optimize electric drive train efficiency? Keen to find an inventive solution to wireless loading for electric fuelling? Philips Applied Technologies provides contract innovation services and creates tailored solutions for progressive businesses across the globe. Partner with us to solve your electrical challenges in multiple areas such as battery management, electric drives, fueling/fuel cells and ergonomics for electric cars.

Accelerating your innovation process

Today's automotive industry is facing totally new technology challenges in the era of hybrid and all-electric vehicles. Philips Applied Technologies is a competent and independent innovation partner with the relevant expertise for companies looking for solutions to these considerable challenges. Our 850 highly educated, innovative yet pragmatic people can tap into more than 40 years of experience in bringing electrical innovations of all kinds to market, based on a wide range of in-house technology and process competences. In more than 1000 innovation projects we have solved numerous technology issues in the development of electrical products and systems. Our knowledge and expertise is ideally suited to the emerging needs of the automotive industry.

Adding value throughout the lifecycle

We work closely with you to create integral and practical solutions, bringing innovation, technology and 'hands on' expertise at every step of the way. We offer specific skills and experience in designing, engineering, testing/prototyping and readying electrical parts, products and systems for mass production.

Working with Philips Applied Technologies will provide your organization with a host of benefits, including:

- Fast development of innovations
- Optimized performance from new and existing ideas or products
- New perspectives to take on the latest challenges in the automotive industry.



Philips Applied Technologies provides tailored solutions to accelerate meaningful innovations, improve efficiency and solve complex technology problems.

Accelerating innovations in seven key areas

To enable, optimize and even accelerate development cycles, Philips Applied Technologies has fine-tuned and implemented a number of service propositions covering some of the key areas for electric cars.

Electro fuelling

Objective: To enable standardization

An electro fuelling standard that enables load management as well as a safe, secure and scalable re-fuelling experience for both wireless and wired loading is vital. If it can also enable advanced purchasing and billing, that's a valuable bonus.

Philips has a track record in managing complex standardization initiatives involving multiple industry players. Our extensive experience and deep understanding of standardization of wired and wireless interfaces has enabled us to develop standards for broad application in consumer markets. Leveraging our competences in interface standardization and design of end-to-end systems speeds the standardization process and consequently the time-to-market of these standards.



Battery management

Objective: To optimize battery performance and lifetime

A well-designed battery pack needs to be integrated with an advanced battery management system to optimize performance. This both extends battery service life and maximizes safety, helping to avoid expensive recalls. However, empirical data on battery behavior is not readily available.

Our ISO certified processes for design, implementation and maintenance of deterministic, real-time embedded systems can be integrated into safety, monitoring and management functions for battery packs. This approach, which has worked for many customers, ensures reproducible high quality and speeds up time-to-market.



Fuel cell development

Objective: To optimize system performance and reliability at low cost

The key challenge is to reduce system cost. Preferably the system runs on conventional or bio fuels, as long as a hydrogen infrastructure is not available. Battery fuel cell hybrid cars are expected to be the most cost effective solution for the near future with minimal CO₂ emission and no noise or vibrations.

Philips Applied Technologies has the technical competences to support fuel cell manufacturers or system integrators in several ways. These include solutions for improved reliability, design for mass manufacturing (leading to significant cost price reductions), and support in the development of effective energy management systems. Results include a lower CO₂ footprint at minimal cost.



Electric drive

Objective: To maximize overall efficiency and lifetime

An electrified drive train with high efficiency will increase a vehicle's driving range. However, if separate components are not integrated optimally, overall efficiency of the drive train will decline. The drive train should therefore be optimized over the complete range of the drive cycle.

Philips Applied Technologies' innovative solutions for complex electric motor designs have been proven to significantly improve efficiency, while integration of power electronics into the electric motor may yield further advantages. The result is a greater driving range with an optimized performance/energy ratio.



actuator & bearings - motion & dynamic control
- metrology & calibration - system architecture -
robotic systems - acoustic & noise mgt - thermal mgt
- tribology - video, vision & imaging - audio & hearing
- streaming & storage - wireless & connectivity - end
to end systems - intuitive user interface - digital rights
- management - digital & analogue electronics - high
& low power mgt - EMC control - Product innovation
- Industrial engineering - human tissue interaction -
perception of materials - bio compatibility of materials
- sensors - bio robotic mechanics - ISO certification
- supply chain development - small series production
- prototyping facilities - EMC testing laboratory -
acoustic laboratory - design for X - value engineering
- product creation consultancy - optical microsystems
- M(o)ems - system architecture - system in package -
laser materials processing - advanced materials shaping
- interconnect & bonding - thermal mgt - adhesives &
encapsula - **Always the right mix**

Sensors

Objective: To answer new sensor challenges in design and system management

Sensors are crucial to many areas of the electric car, especially where there is a lack of empirical data for actual service life estimations such as in the battery pack component. A large number of sensors may be necessary to provide appropriate data for management systems, but too many sensors can lead to increased complexity and cost. New challenges ask for a new sensing approach.

Philips Applied Technologies has proven competence in a wide range of sensing technologies such as IR, optical, pressure, capacitive, strain gauges and MEMS. We apply innovative new sensing principles and optimize the number of sensors and interconnects, while still capturing all the essential information for car management systems.



Passenger auxiliary systems

Objective: To improve comfort and safety while reducing energy consumption

Enhanced comfort and safety for drivers and passengers is an important differentiator for all vehicles. In the electric car such functions must have low energy consumption and low weight to minimize their influence on vehicle range.

At Philips Applied Technologies we combine expertise in ergonomic user designs with studies of user behavior, to optimize functional integration. Automated (dis)comfort functions that enhance the driving experience can be implemented with flexible electronics, embedded into the fabric of roofs, doors and seats. Thermal airflow modeling is used to keep heating/cooling requirements to a minimum and also results in the improved perception of well-being by the driver and passengers.

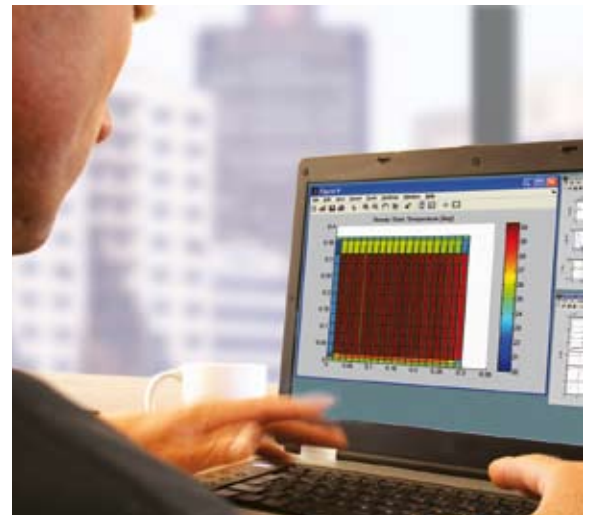


System performance simulation

Objective: To enable faster time-to-market

Many new car component concepts require higher voltages, bringing heat and EMC problems. Such components also combine diverse technical competence areas. Use of integrated software simulation for thermal modeling, safety, EMC and durability testing can identify problems early to help avoid costly redesigns.

Integrating multiple views into the simulation is exactly how Philips Applied Technologies assists you in your product creation process, starting with simulation, via verification with hardware in the loop, up to approbation and certification using certified ISO processes.



Letting innovation work for you

Philips Applied Technologies creates tailored solutions for progressive businesses across the globe. Businesses just like yours. We partner with you to accelerate your time-to-market through rapid innovation. We cut your operational costs and increase your profitability, by identifying process efficiency improvements. And we give you peace of mind, by finding solutions to complex technical problems. Our style is pragmatic, our resources best-in-class, and our approach to challenges legendary. If you're looking for a competitive edge in the electric car supply chain, call us today.

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