



## AIT AUSTRIAN INSTITUTE OF TECHNOLOGY

The AIT Austrian Institute of Technology is Austria's largest research and technology organisation. With its seven Centers, the AIT regards itself as a highly specialised research and development partner for industry, and its researchers are tackling the key infrastructural challenges of the future: Energy, Health & Bioresources, Digital Safety & Security, Vision, Automation & Control, Transport Technologies, Technology Experience and Innovation Systems & Policy.

## CENTER FOR TRANSPORT TECHNOLOGIES

Mobility is a core pillar of human society and therefore a central factor in our economic system. At the AIT Center for Transport Technologies, around 200 experts are working on solutions for sustainable, safe, intelligent and thus future-proof mobility. The focus of the research and development work is on material-based lightweight design, on the electrification of the propulsion train and the storage of electrical energy, as well as on a resilient and safe transport infrastructure. This also includes environmentally compatible and intelligent production technologies for mobility components. Comprehensive system know-how, scientific excellence, state-of-the-art laboratory infrastructure and many years of international experience enable AIT experts to drive innovations in the field of climate-friendly mobility and thus to serve industry and society already today with the solutions of tomorrow.

MORE ABOUT E-MOBILITY:



<https://www.ait.ac.at/en/emob>



**1.400**  
EMPLOYEES

**10** LOCATIONS

**7** CENTERS

**AUSTRIA'S LARGEST  
RESEARCH AND TECHNOLOGY  
ORGANISATION**



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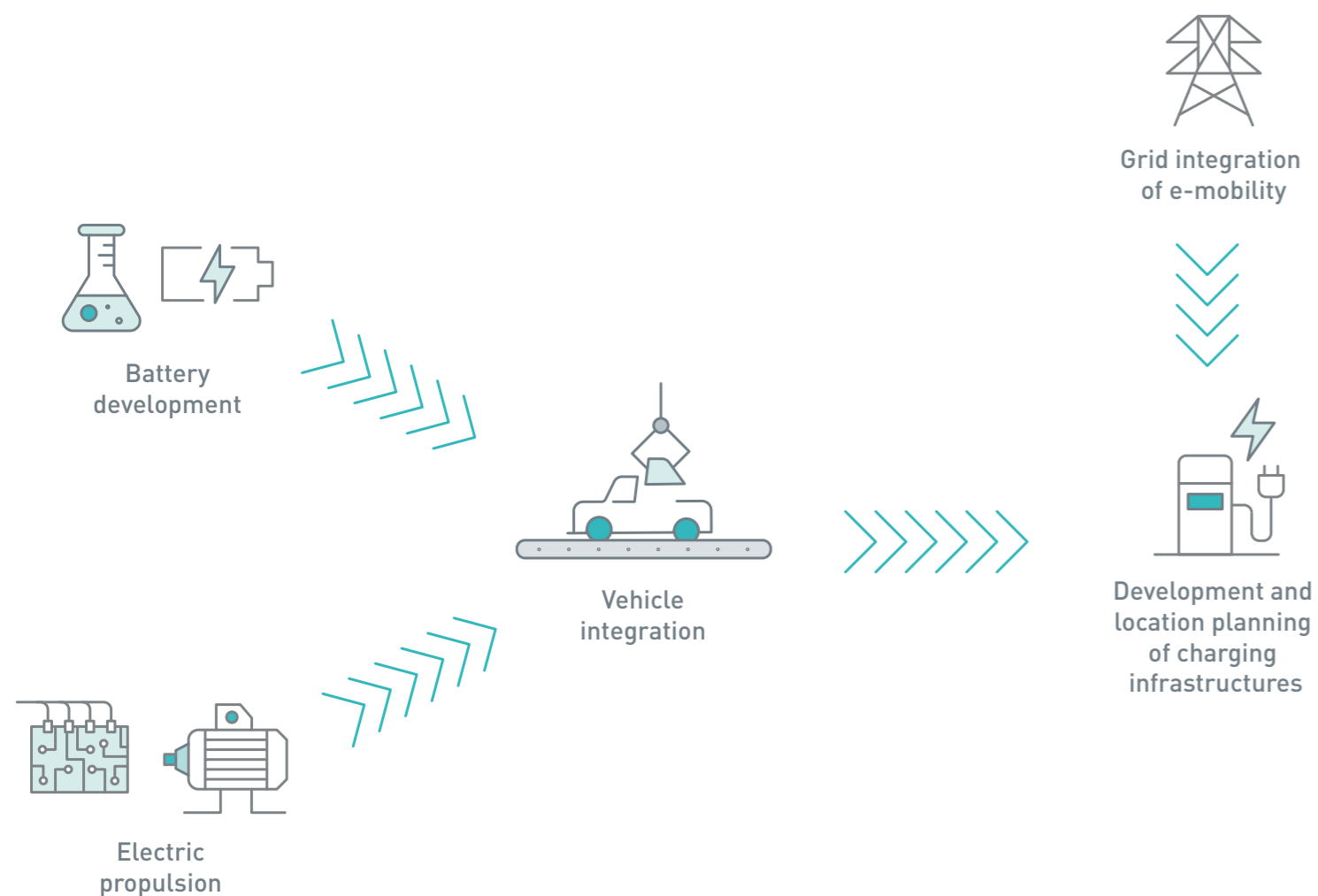
## E-MOBILITY

...means more than the electrification of vehicles

The implementation of electric mobility on a broad basis is a challenge for research and development activities.

Electric vehicles must meet range and safety requirements and require the development of new battery systems, highly optimized electric drives and their compatibility with lightweight construction concepts.

When integrating e-mobility into the grid via charging stations, it is important to guarantee a high level of supply reliability, grid stability and voltage quality at the same time.



### BATTERY DEVELOPMENT

The battery is the centrepiece of modern electric drive concepts. Therefore, great efforts are being made worldwide to make this electric energy storage unit as efficient, powerful, cost-effective and safe as possible.

- Battery materials research
- Cell production
- Battery testing

### ELECTRIC PROPULSION

In the field of electric propulsion the research is focused on novel technologies and topologies for the investigation, analysis and realization of energy efficient, safe and low-carbon propulsion components and concepts.

- Component development
- Power electronics
- Electric drive trains

### VEHICLE INTEGRATION

Simulations enable to investigate the complex interaction between individual components and the vehicular system as a whole. The research team's expertise ranges from lightweight components and electrical machines to the simulation of entire vehicles, component integration and monitoring during operation.

- Integration & Simulation
- Lightweight design

### E-MOBILITY IN DAILY LIFE

Electric mobility currently strives to find a balance between the acceptance of potential users, the extent of services provided and public incentive models. Comprehensive integration into the mobility system must therefore address the following issues:

- Traffic safety
- Mobility behaviour
- Adaptation of infrastructure
- New types of vehicle classes

### FLEET MANAGEMENT AND LOGISTICS

Modern fleet management considers the integration of e-vehicles so that the most suitable means of transport is available for the respective purpose. The focus also lies on integrating e-mobility into sustainable solutions for freight transport:

- Optimization of fleet plans and routing
- Electrified automated factory traffic
- Multimodal sustainable logistics concepts

### DEVELOPMENT AND LOCATION PLANNING OF CHARGING INFRASTRUCTURES

The transport infrastructure forms the basis for an efficient mobility system. Targeted planning of charging stations is therefore a prerequisite for the successful use of e-mobility.

- Optimization of the positioning of charging stations
- Load management and integration into the grid

### NETWORK INTEGRATION OF E-MOBILITY

The increasing demand for power caused by electric mobility represents a new challenge for electric grids. Our focus is on system integration, power electronics, storage, and charging infrastructure.

- Grid integration
- Network stability
- Interoperability and conformance testing

## AIT Reference Projects

### 3BELIEVE

- Development of automotive battery cells that are highly performant (high energy density, fast charge capability, long cycle life) and free of critical raw materials such as cobalt and natural graphite
- Development and integration of sensors into and onto the cells to enable smart, adaptive operating strategies and advanced diagnostics in order to extend the useful life of the battery in first and second life applications and improve safety
- A comprehensive manufacturing approach that is designed from the outset for a circular economy and industrial volumes



### E-WALK

- Small e-vehicles as a contribution to a sustainable mobility - integration into the overall mobility system as a central challenge
- In cooperation with the Kuratorium für Verkehrssicherheit and Herry Consult, comprehensive tests are carried out and a catalogue of measures is compiled

### REALLI!

- Realisation of optimised Li-ion batteries for the breakthrough of e-mobility: significant increase in performance and reduction of cobalt
- Improving the lifespan and safety of the traction battery



### SOLIFLY

- The aim is to develop multifunctional structural components with an integrated semi-solid-state battery for aeronautical applications
- Development of two different scalable battery cell concepts, construction of a demonstrator