

Innovation Network
FutureCar

»Mobility Transformation«

How to prepare solutions and organizations for change

Network Phase VII – 2023/2024



Fraunhofer Institute for Industrial Engineering IAO

Profile of the institute and its areas of research



Fraunhofer Institute IAO 1981
University of Stuttgart IAT 1991
Founded



Prof. Dr.-Ing. Prof. e.h. Wilhelm Bauer
Univ.-Prof. Dr. rer. oec. habil. Katharina Hölzle
Univ.-Prof. Dr.-Ing. Oliver Riedel
Apl. Prof. Dr.-Ing. habil. Anette Weisbecker
Dr.-Ing. Florian Herrmann
Management board

Digital Business

Service and Human Resources Management Systems

Mobility and Innovation Systems

Cognitive Engineering and Production

Organisational Development and Work Design

Responsible Research and Innovation

Smart Energy and Mobility Solutions

Human-Technology-Interaction

Cognitive Service Systems

Urban Systems Engineering

Numbers in 2021:



42.1
M€ finance volume



545
Research projects



647
Employees



230
Project partners



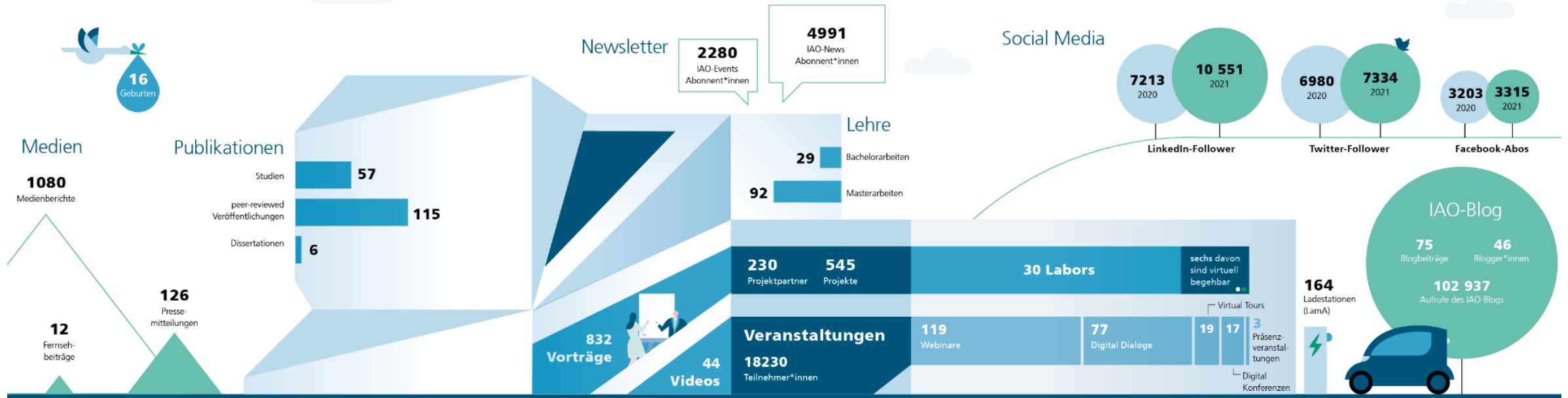
178
Scientific publications



832
Scientific presentations

Fraunhofer IAO in numbers

Facts and figures for 2021



Doctorates and theses

- 6 Doctorates
- 92 Master theses
- 29 Bachelor theses

Publications and public relations

- 115 peer-reviewed publications
- 57 studies
- 18,230 event participants
- 1080 media reports
- 75 blogposts on the IAO blog

Projects

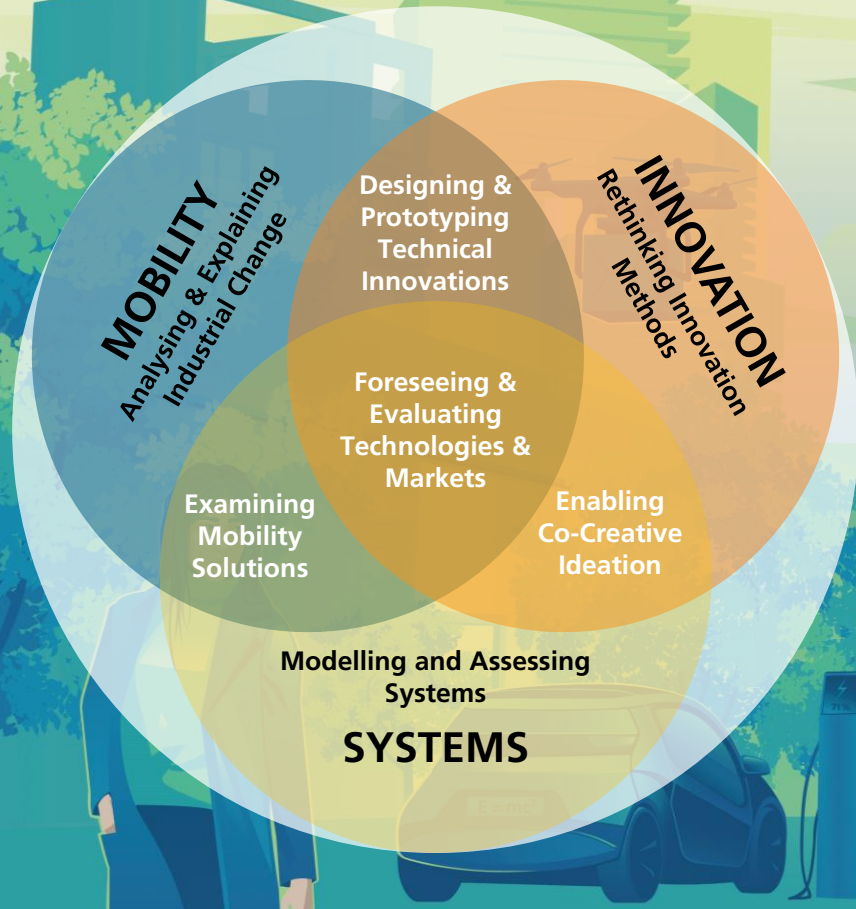
- 230 project partners
- 545 projects

Data from February 2022



Fraunhofer IAO - Mobility and Innovation Systems

Our knowledge supports you to solve the challenges of shaping the mobility of tomorrow



- **Interdisciplinary research** department consisting of ...
 - Industrial and Mechanical Engineers, Management and Social Scientists, Designers, Traffic Planners and more
 - Around 20 professionals and 30 student workers
- Industrial focus on the **digital transformation of the automotive industry** and its products
- Scientific focus on **new innovation methods** that help to understand, assess, and design radical innovations
- Our main approach
 - **systemic understanding** of innovation tasks as product-service-systems
 - development of appropriate solutions by the use of **modern science** (e.g. data science, AI, customer empathy, makerthons & open innovation)



The Innovation Network FutureCar in a nutshell

A platform for joint and pre-competitive research on mobility related technologies and trends

- Support in understanding and solving the challenges of a **transforming mobility sector**
- Organisation and content by **Fraunhofer and external experts**
- **Three conferences** per year plus additional services
- **2 year membership** contract
- € 20 K membership fee p.a.¹

⚡ Industry pain points ⚡

Transformation of the mobility sector

New vehicle technologies

New market players

Increasing complexity

High uncertainty

Innovation in mobility pre-development

Need of innovative idea generation

Specific and unknown user needs

Need of open mindset and external input

Solutions and benefits through FutureCar

Future technology and trend scouting

☑ Identification of new technologies and trends

☑ Validation of newly arising technologies

☑ Providing a knowledge lead

Strength through collaboration

☑ Bring together different players for new links and contacts

☑ Identification of new partnerships

☑ Exchange of opinions and collaborative learning

Gateway to Fraunhofer-Gesellschaft

☑ Gateway to the research world and scientific insights

☑ Conjoint writing of funding applications

☑ Support in research and development

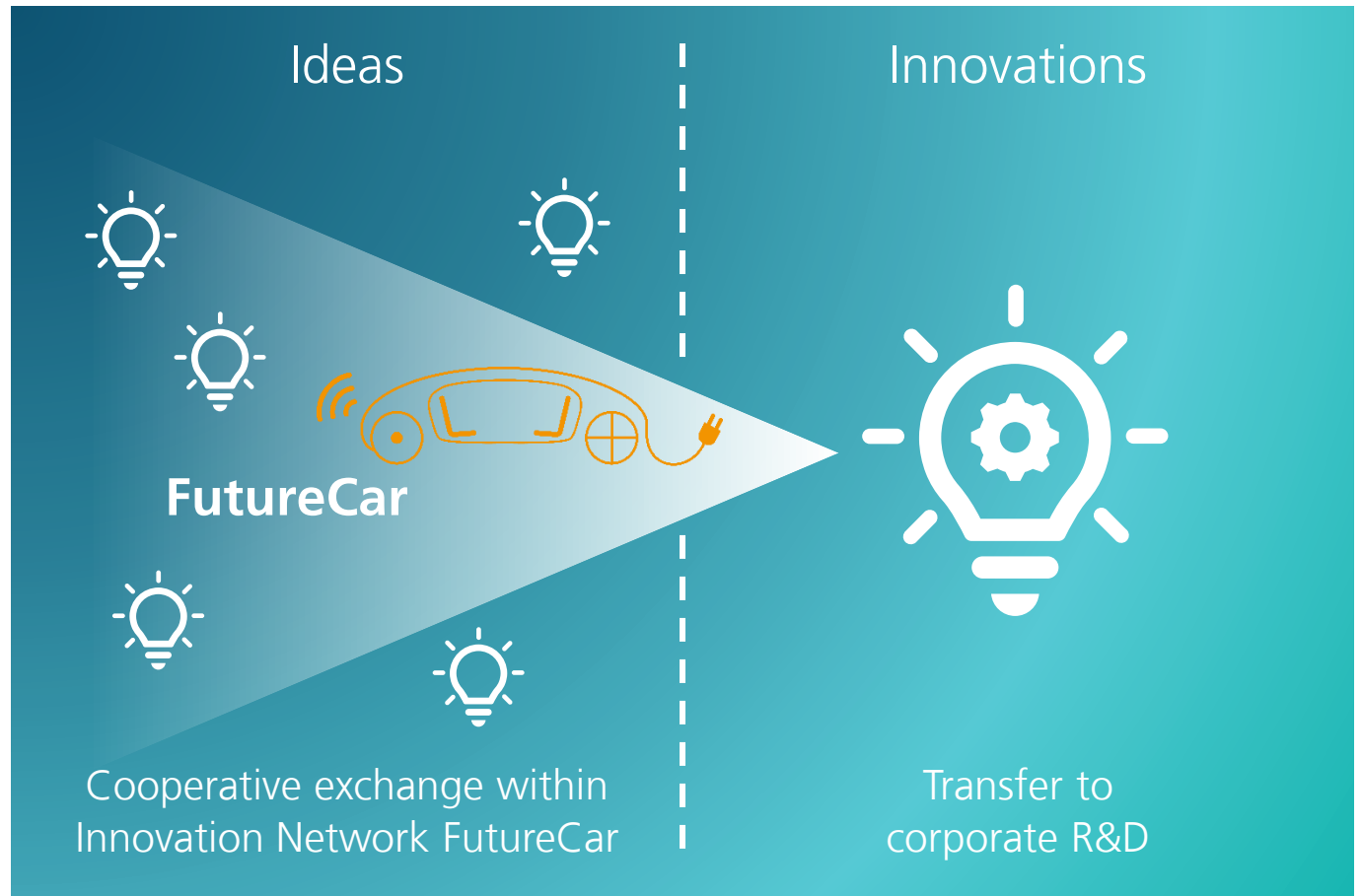
¹ € 10 K membership fee p.a. for SME: < 250 employees and either revenue < € 50 M p.a. or balance sheet < € 43 M p.a. (Art. 2 des Anhangs zur Empfehlung 2003/361/EG)



Innovation Network FutureCar

A platform for joint research and pre-competitive dialogue

- Discussion of topics and ideas which are **ahead of corporate R&D** programs
- Open exchange of opinions leading to a **common understanding of early stage technologies**
- Meeting platform for like-minded innovators on a **multidisciplinary and cross-company basis**

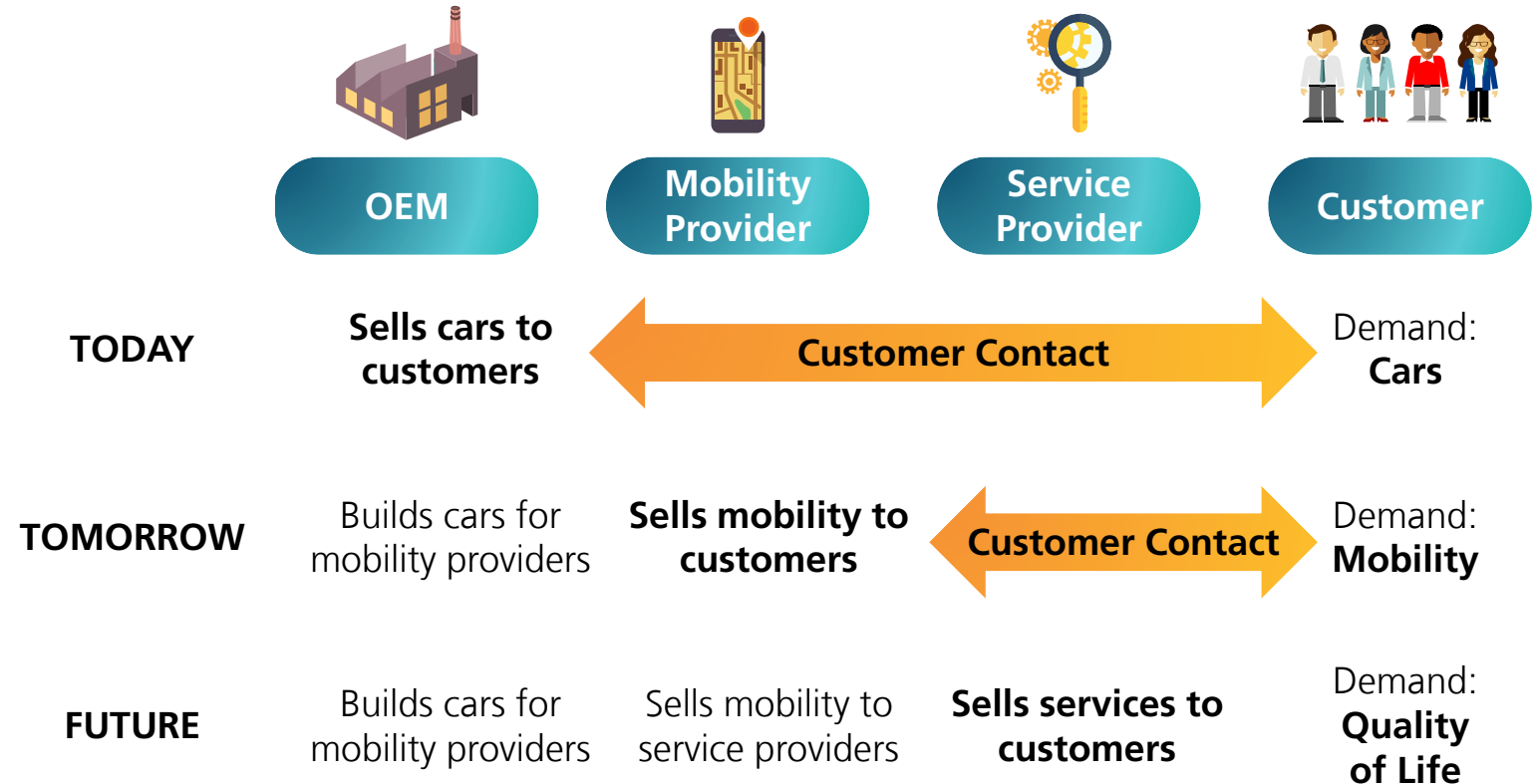




From selling cars to service subscription

Mobility transformation changes value proposition and demand

- An increasing number of users is asking for **highly flexible and personalized mobility solutions** that go beyond possessing a personal vehicle
- Traditional players in the market need to **adapt their offer** and **rethink their market positioning**
- New, **service-oriented platform solutions** can change current value chains and the point of direct customer contact

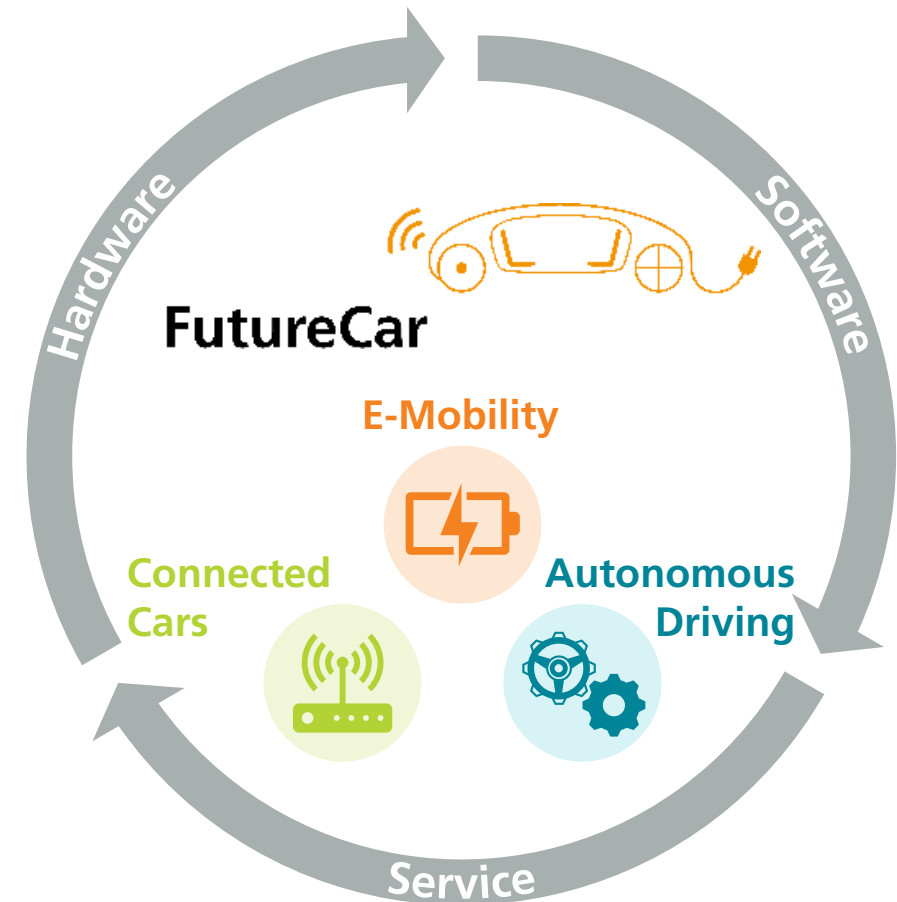




Future vehicles are highly influenced by the »CAE« technological drivers

As known from previous FutureCar phases, technology trends form the core of activities

- The exit from fossil fuels will require sophisticated solutions for future vehicle with **environmentally friendly drive trains**
- **Connectivity and data-based services** will enable the transformation towards fully digitized vehicles of the future
- **Increasing automation** will change future vehicles as well as the entire mobility ecosystem
- Within this context, future mobility solutions will be implemented in **integrated, new hardware, software, and services architectures**





Topics in FutureCar Phase VII »Mobility Transformation«

Core automotive technologies in the changing mobility sector

Component-Layer

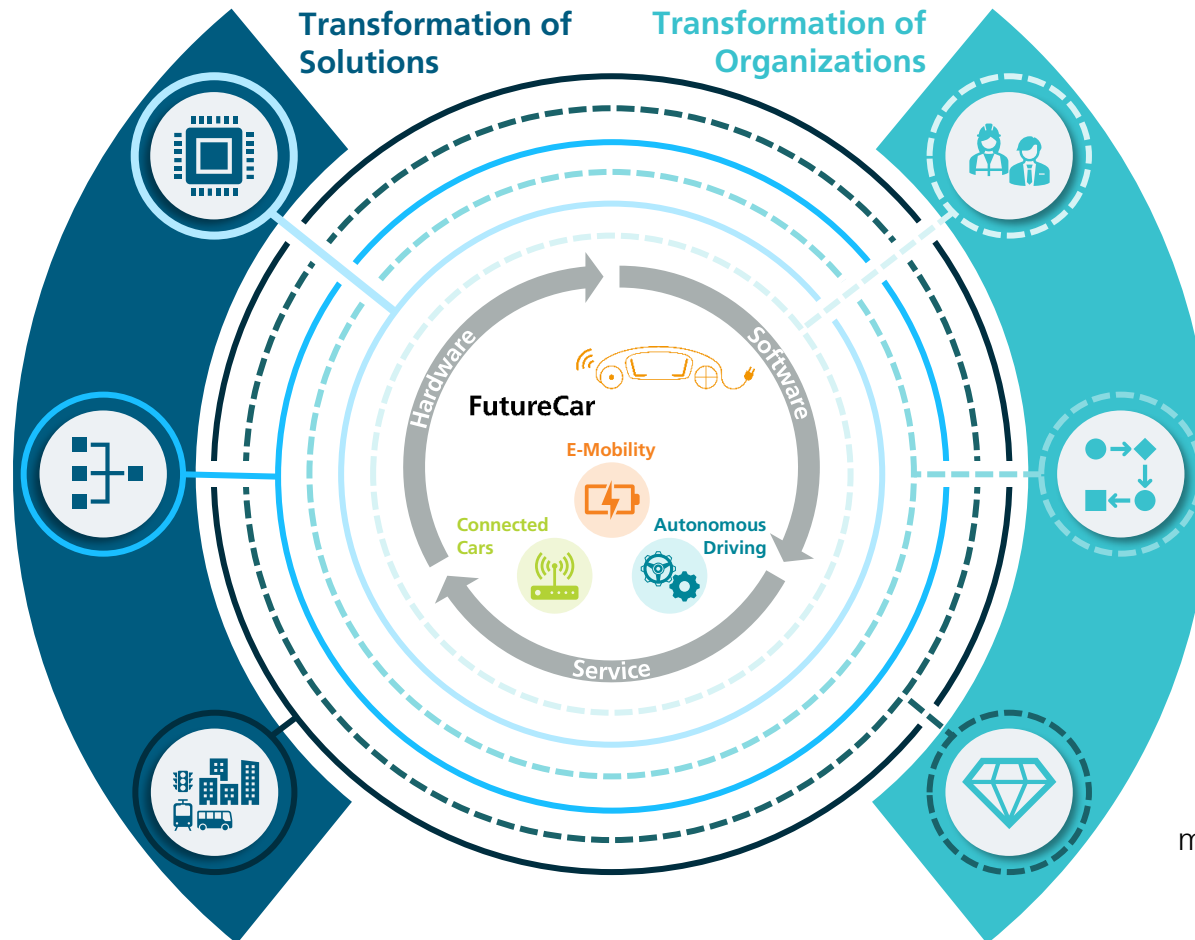
Innovative technology, new materials as well as components with smart functionality remain to be a major driver for future mobility solutions

Vehicle-Layer

Vehicles are no longer understood as an assembly of parts but rather a complex technical system of hardware, software, and services with respective architectures

Ecosystem-Layer

With vehicles being turned into smart mobility solutions, more attention must be paid to interdependencies within the ecosystems they are deployed in



Competencies

Transformation is not possible without gaining new knowledge and preparing employees for changing fields of activity

Processes

Interdisciplinary and agile development as well as production of integrated product-service systems require appropriate processes and methodologies

Value Creation

New possibilities of mobility data monetization and higher service orientation lead to new ways of generating revenue both independently and with partners



Transformation of Solutions

Future mobility solutions as innovative product service combinations and ecosystem constituents

- Future mobility solutions will be driven by **innovative technologies and sustainable materials**
- We are observing an increasing trend of **system-oriented approaches to new product development** and respective architectures on both hardware and software side
- Technologies and systems must be put in a certain context and require R&D teams to **adopt an ecosystem perspective**

Component-Layer

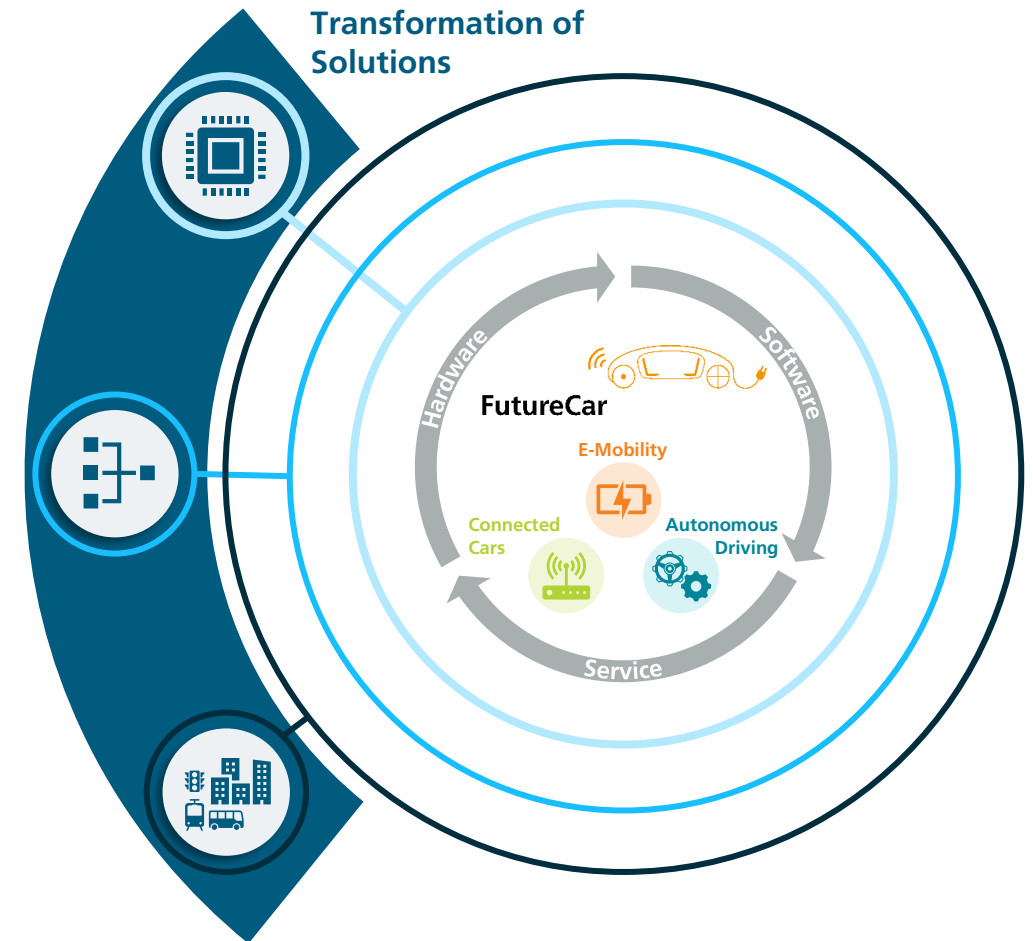
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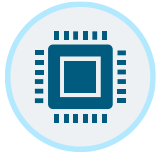
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Ecosystem-Layer

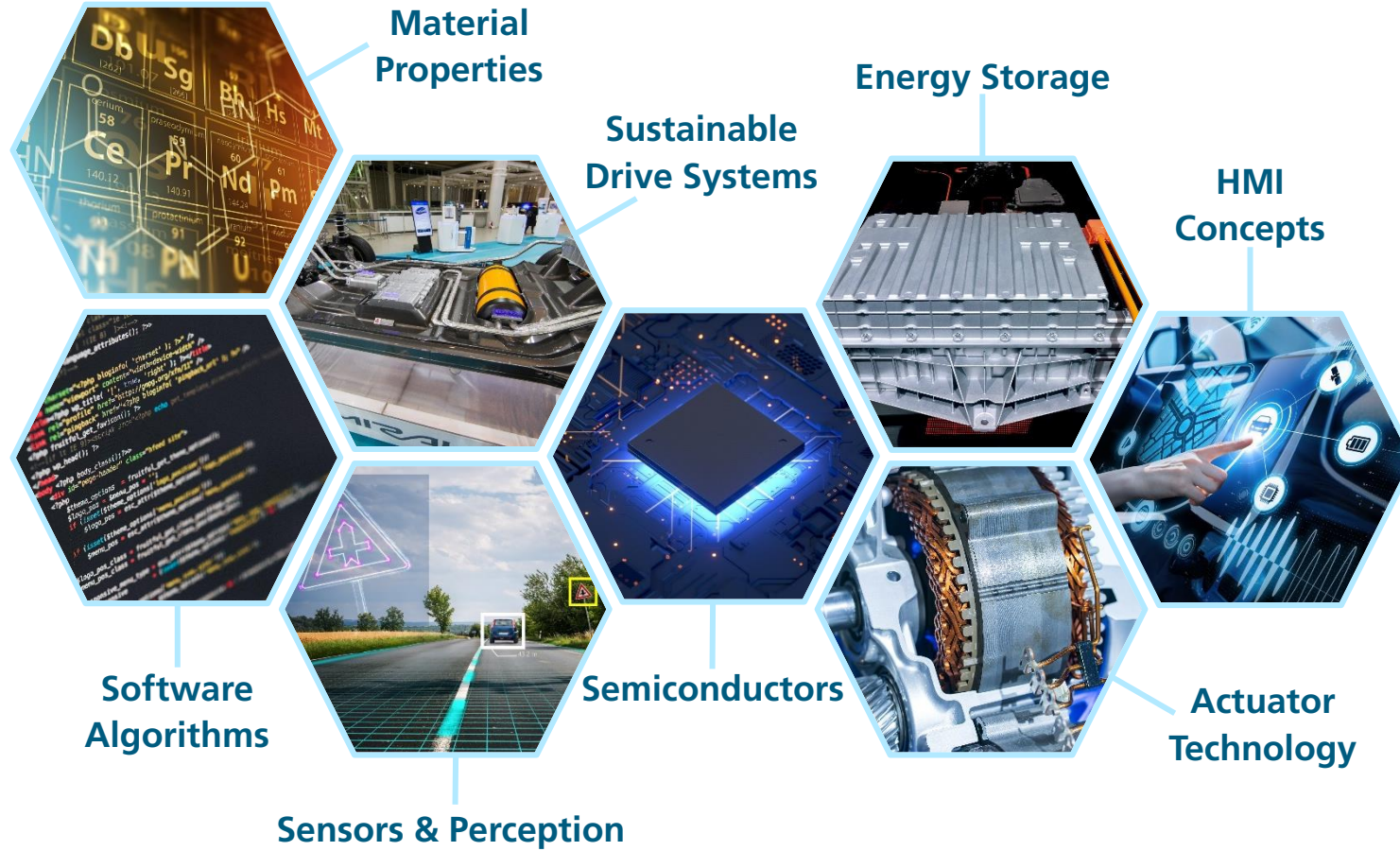
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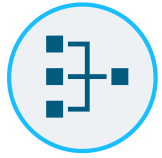




Component-Layer

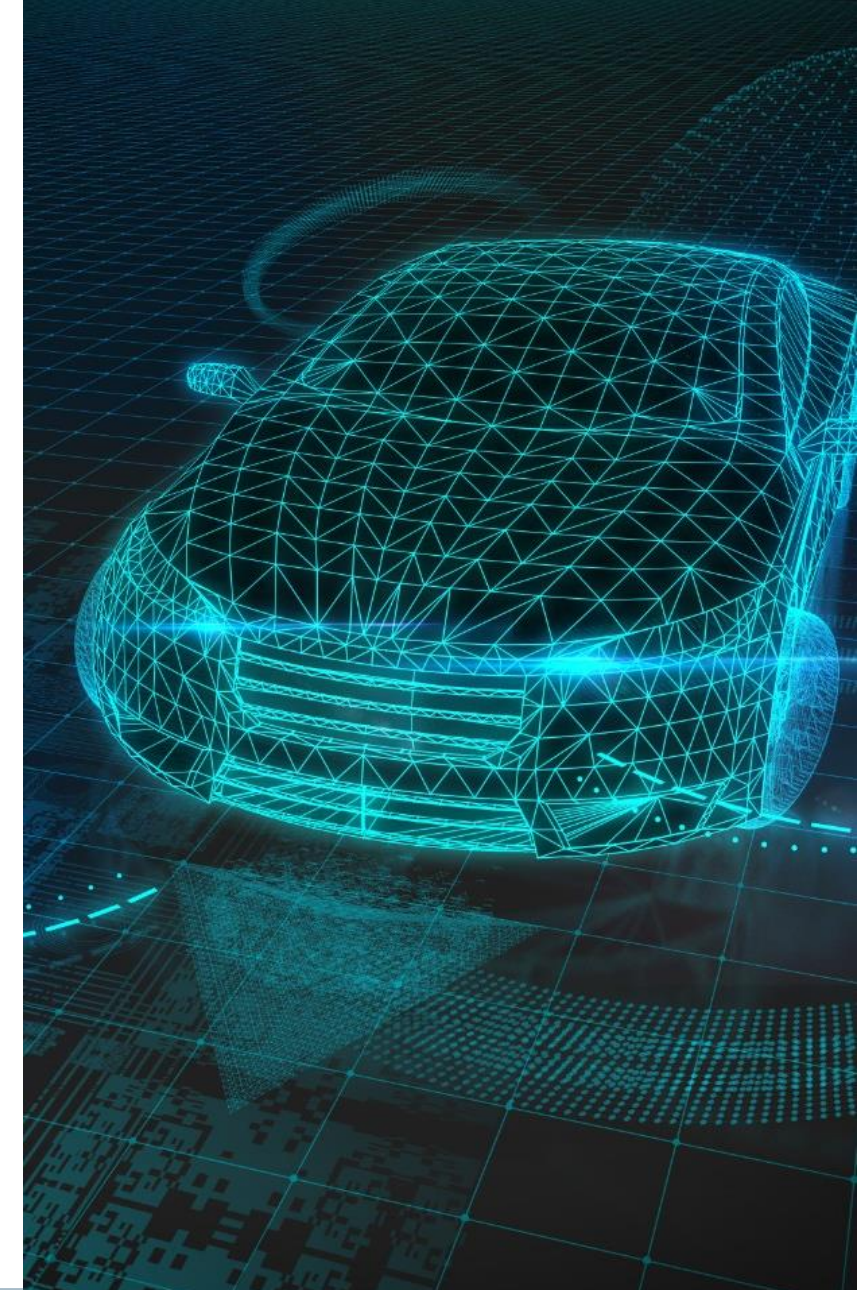
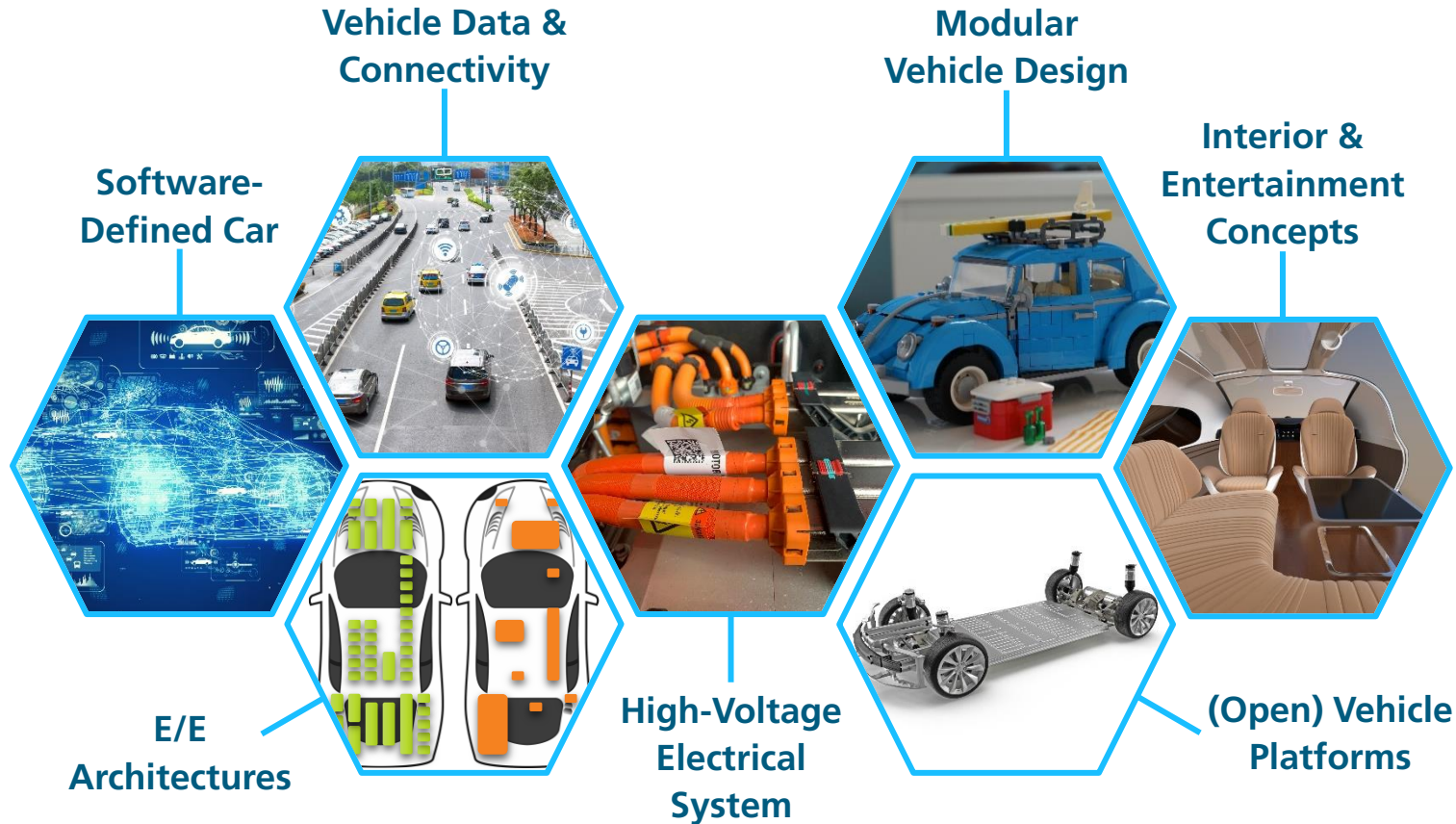
Deep dive into technologies, functions, and properties





Vehicle-Layer

Perspectives on different vehicle systems and architectures





Ecosystem-Layer

Thinking the vehicle from an ecosystem perspective





Transformation of Organizations

Change can only happen if we adapt our ways of developing new mobility solutions

- Transformation can only succeed if employees are **trained for changing tasks** and **new knowledge and competencies** are built up
- Changing characteristics of products and services** as well as technologies **require organizations to adapt** their processes and methodologies
- With the vehicle market turning into a **market for mobility solutions**, new ways of value creation, cooperation, and business models are needed

Competencies

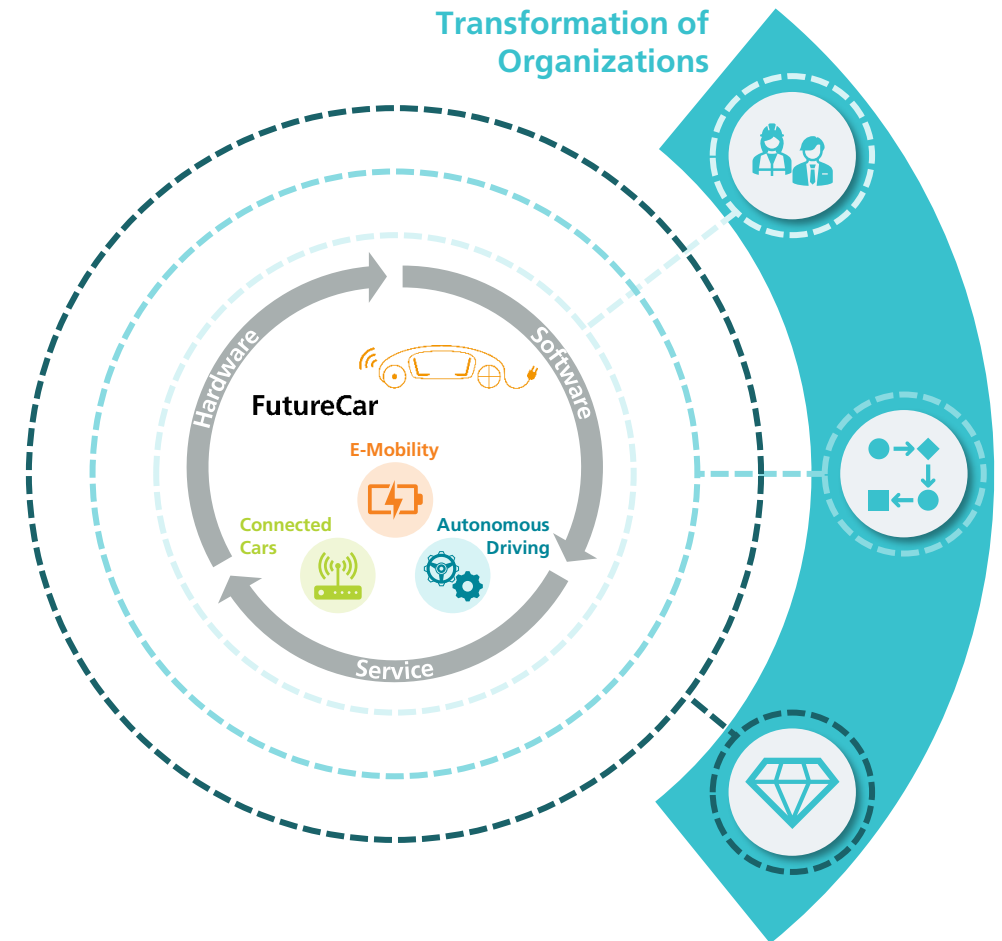
Transformation requires gaining new knowledge, transforming the entire workforce and preparing employees for changing fields of activity

Processes

Interdisciplinary and agile development as well as production of integrated product-service systems require appropriate processes and methodologies

Value Creation

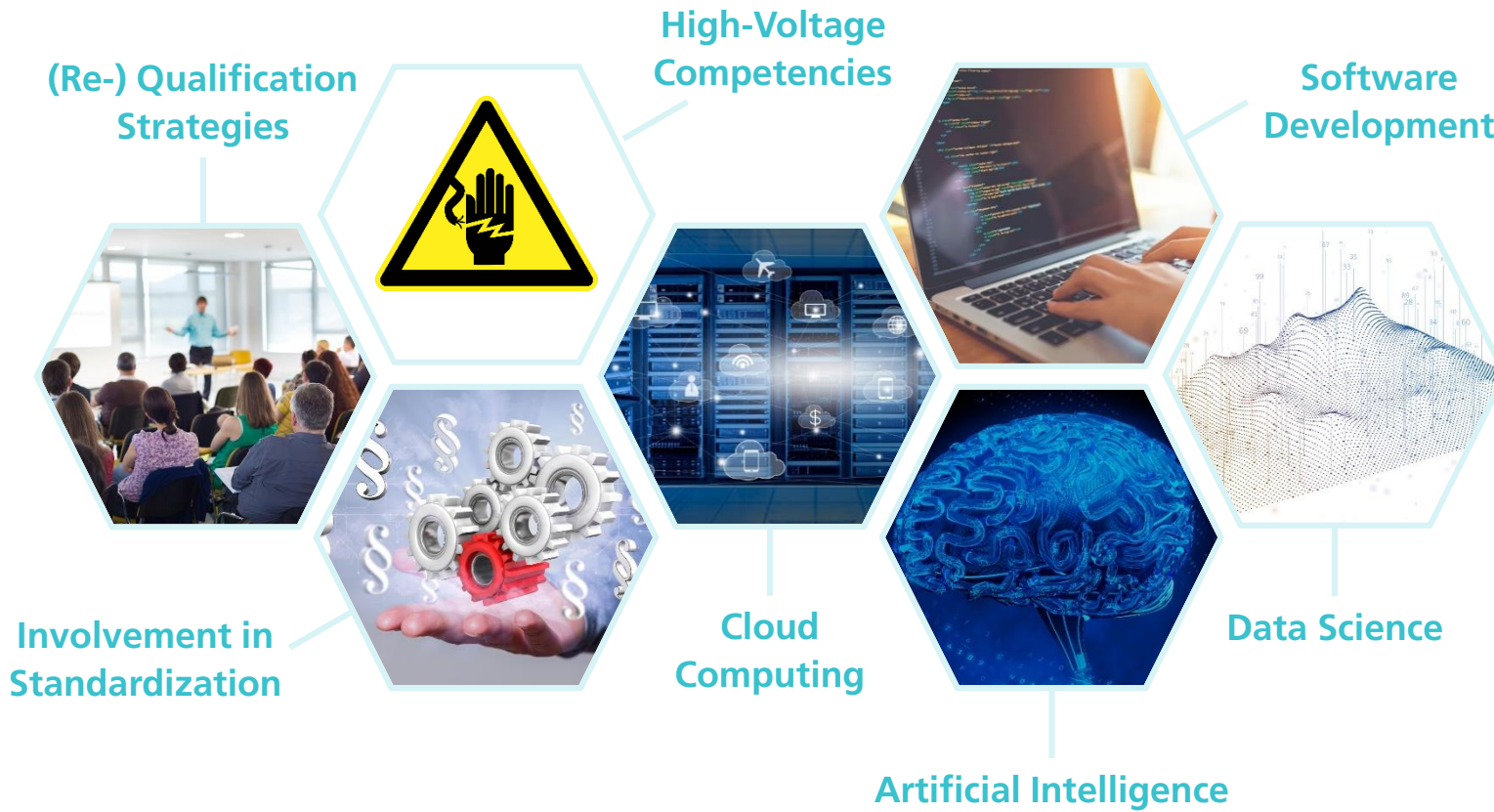
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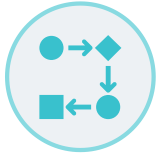




Competencies

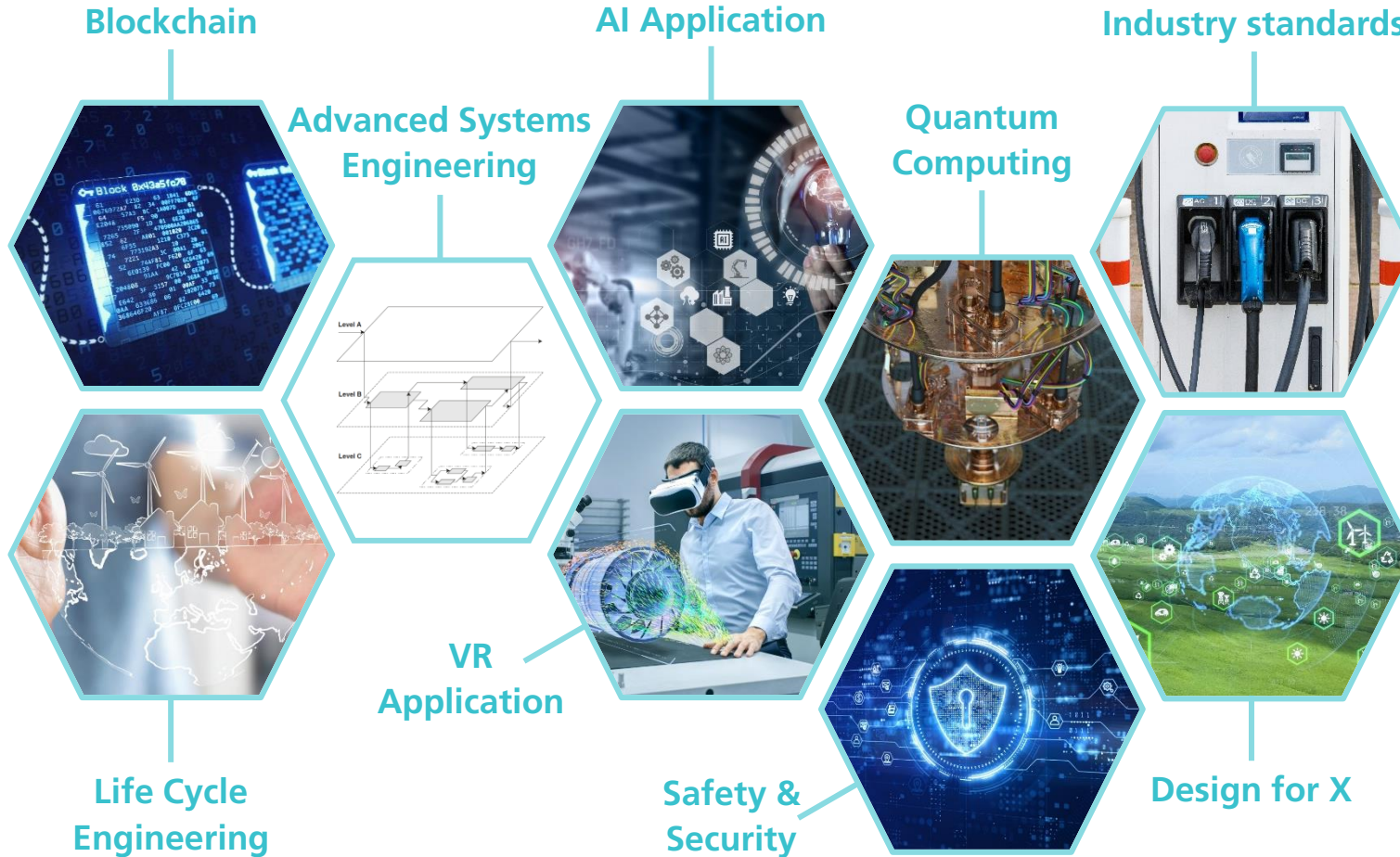
Moving towards a workforce transformation





Processes

Methodologies and approaches to tackle increasing complexity





Value Creation

Commercializing a new product and service understanding

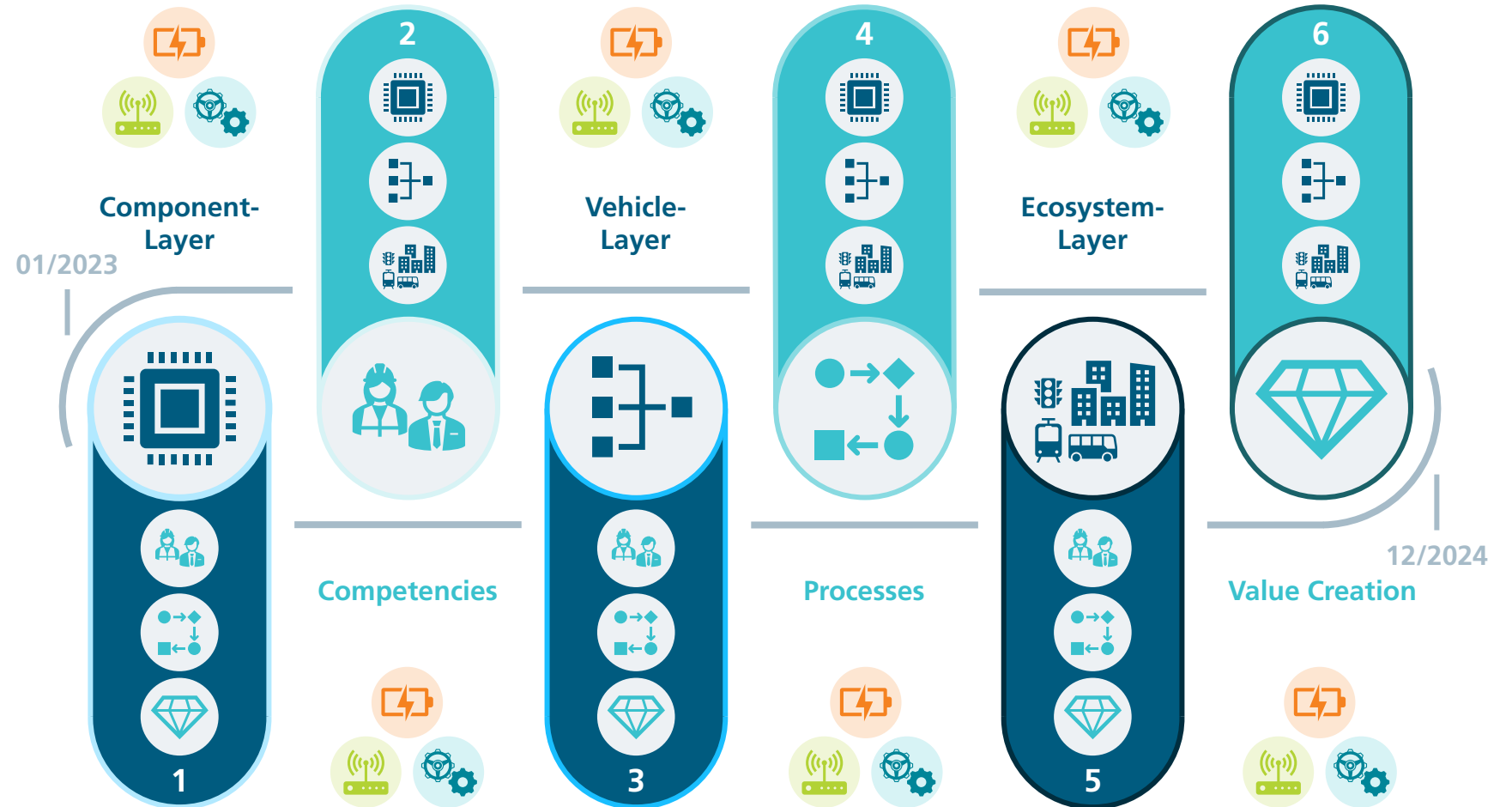




FutureCar Phase VII

Dedicated conferences on technologies and trends within mobility transformation

- A total of six **two-day network conferences** are core elements of the **Innovation Network FutureCar Phase VII**
- Each conference focuses **on one main topic**, additionally taking into account the respective **aspects of the other transformation area**
- Naturally, **automotive core technologies** will be the backbone of all FutureCar conferences

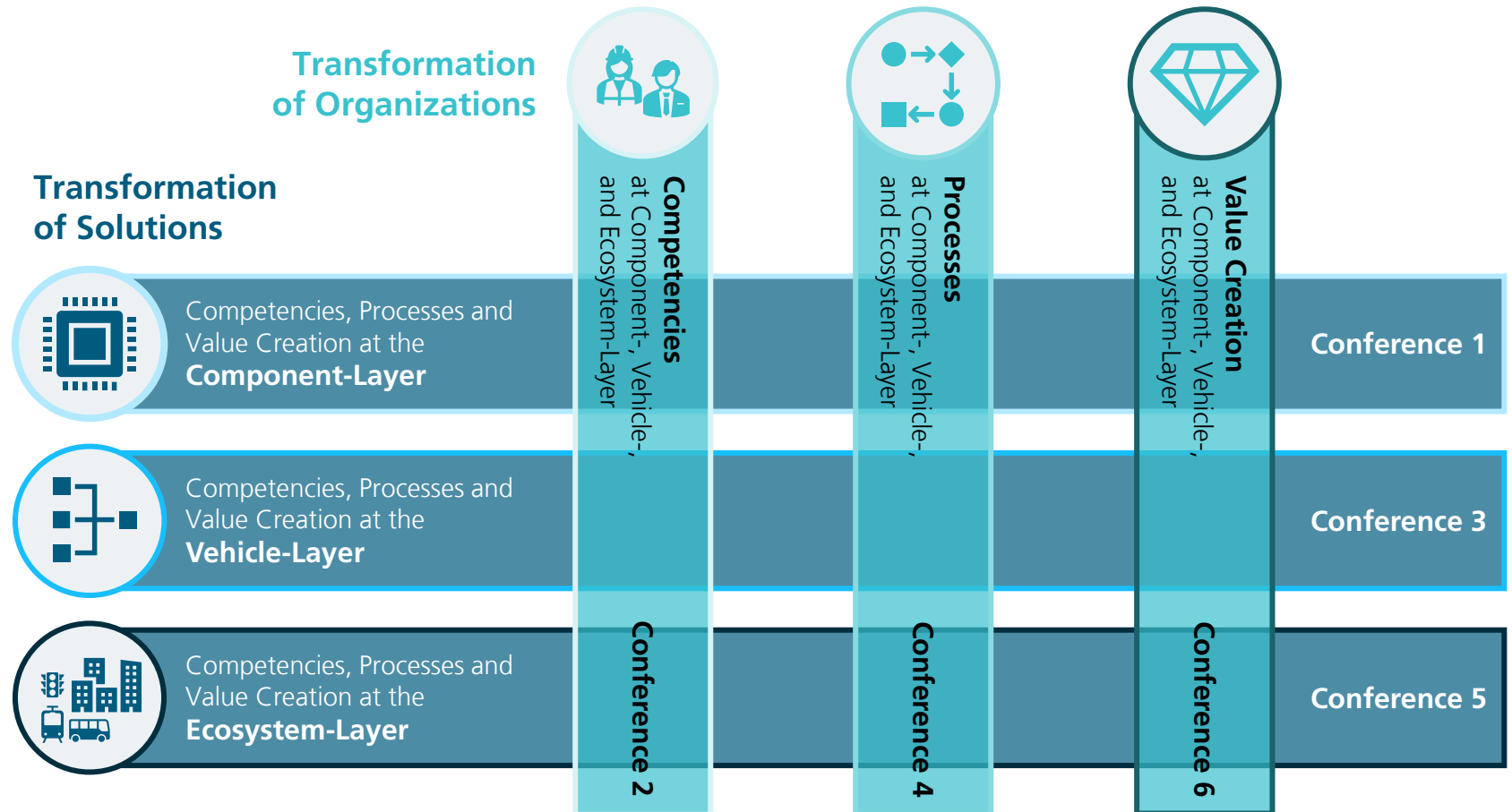




Six cross-cutting perspectives on mobility transformation

Evaluating transformation on solutions and organizations at several levels of granularity

- Transformation in Organizations will address various topics on **necessary changes concerning how we create future mobility solutions**
- Transformation in Solutions covers various topics on **interdependent components and systems that future mobility solutions are made of**






FutureCar Network Conferences

The core elements of FutureCar Innovation Network

- **Two-day network conferences** on versatile topics in **changing locations**
- The broad program provides **insights in different company and research labs** for a cross-company exchange.
- During the conferences there is **time for in-depth discussions and networking**.




 **We visit and experience** R&D centers, labs, and creative workspaces.

- Faurecia R&D Center, Hagenbach
- Lotus Tech Innovation Centre, Raunheim
- BMZ Battery Plant, Hanau
- e.GO Prototype Factory, Aachen
- Mobility Innovation Lab, Fraunhofer IAO

Examples from previous FutureCar phases



 **We present and discuss** current and relevant network topics.

- Fraunhofer IAO keynotes as impulses and discussion starters
- State of the art research insights by other Fraunhofer Institutes
- Presentation of innovative ideas and concepts from industry speakers
- Start-up pitches by selected automotive entrepreneurs



 **We conjointly work** in group and creativity workshops.

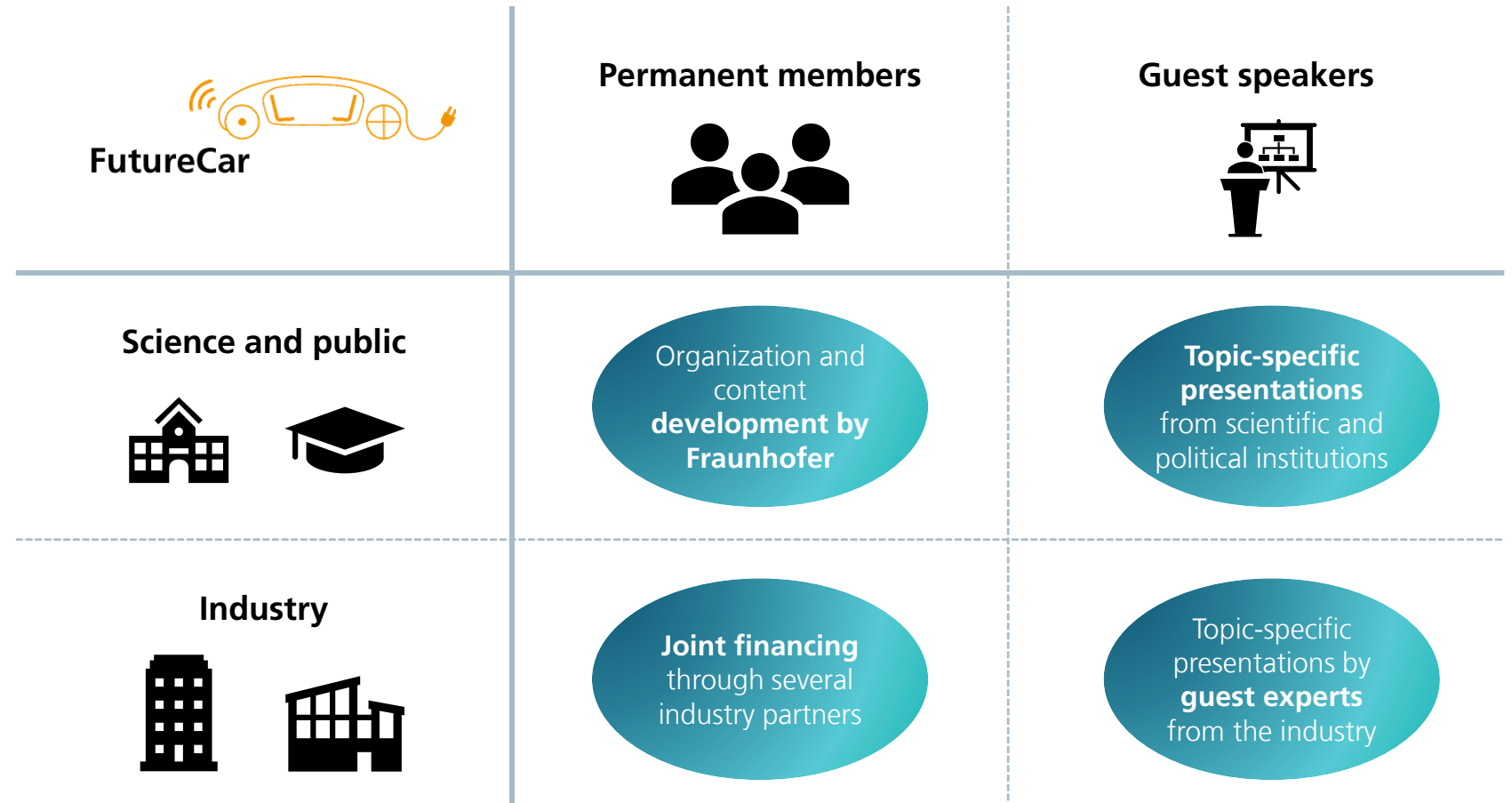
- Brainstorming of new project ideas
- Elaboration of project proposals
- Discussion of current issues in automotive industry
- Collaborative development of future network topics and fields of interest



FutureCar partners and networking opportunities

Members from industry and research meet external guest experts

- The FutureCar network **brings together different players** and experts in the fields of future automotive technologies and mobility trends.
- **The permanent network members benefit** from all provided contents, the additional services as well as the gateway and early stage access to cutting-edge research.





Additional services

Support and additional information on a regular basis

- **Innovation Networks** base on **collaboration and constant exchange of ideas** about new technologies and their potentials
- **Knowledge transfer** through regular updates on the automotive industry and latest technology trends as well as interesting funding programs
- **Additional meetings** throughout the phase VI for content related **networking opportunities**

Forum FutureCar:

- Annual, public conference on a future mobility topic
- Free of charge for FutureCar members

FutureCar Newsletter:

- Monthly news covering the core technology trends of E-Mobility, Connected Cars, and Autonomous Driving as well as different aspects of Mobility Transformation
- Additional updates from industry and research



Funding Program Support:

- On-demand support and update on relevant funding programs for public project applications in FutureCar topics
- Support in consortia building and application processes

Knowledge Access:

- First hand insights and knowledge transfer from academia and the scientific community, especially Fraunhofer-Gesellschaft
- Direct link and match making between FutureCar members and Fraunhofer experts



Terms and conditions

Two-year contract for company-membership including six conferences and additional services

- FutureCar is **collectively financed by all members** and **organized by Fraunhofer IAO**
- Membership includes the **attendance at all three conferences** per year, including subsequent **minutes, workshop results and presentations** shared by the speakers
- Additional services** during the whole network term and access to the entire **research community within Fraunhofer-Gesellschaft**

Network Term

- Two-year contract, 01/2023 - 12/2024

Network Schedule

- Three two-day conferences per year (~March, July, October)
- Hybrid format for flexible participation in person or online

Membership Fee

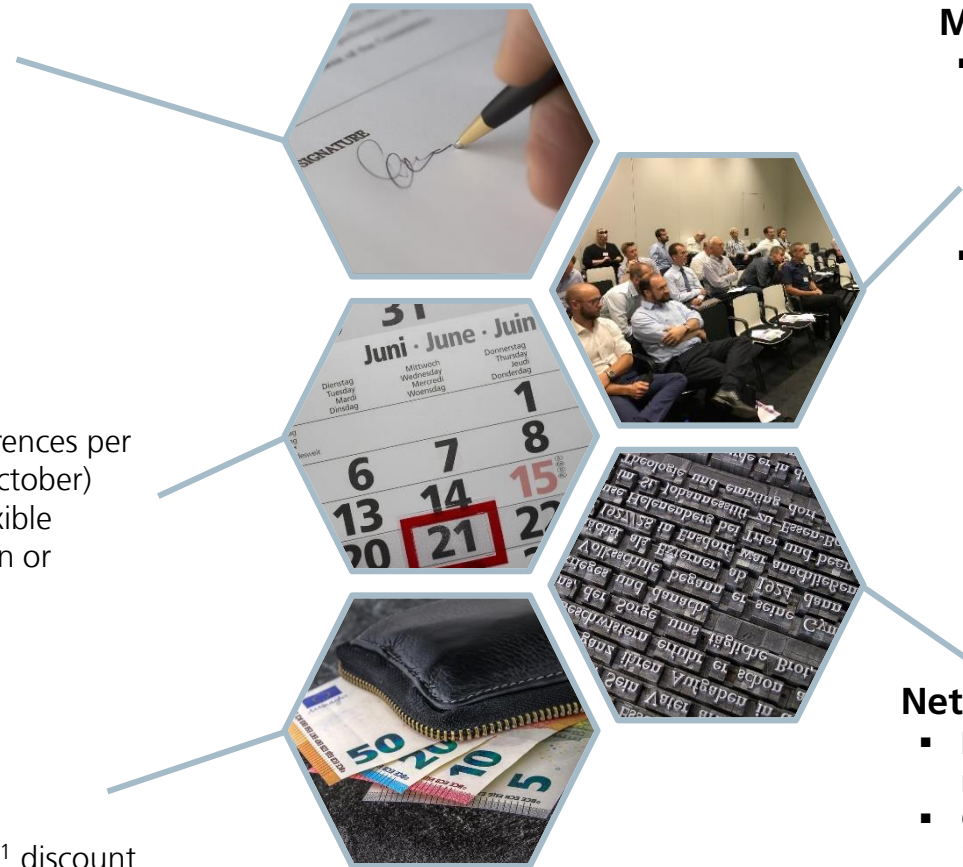
- € 20 K p.a.
- € 10 K p.a. with SME¹ discount

Meeting Attendance:

- Company-wide membership, not limited to specific groups, business units, or employees
- Four attendees max. per conference (exceptions possible)

Network Language:

- Network conferences and newsletter in English
- Communication in English and German



¹ < 250 employees and either revenue < € 50 M p.a. or balance sheet < € 43 M p.a. (Art. 2 des Anhangs zur Empfehlung 2003/361/EG)

Contact us!

We look forward to exchanging

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