An Executive Summary of the study “Determining the Medium- to Long-Term Standardization Requirement for Electromobility Based on Socio-Economic Developments” has been created on behalf of DIN. The study is part of the DIN’s programme for setting the standards of electromobility mandated by German Federal Ministry of Economics and Technology.
The German Federal Government has specified the objective of ensuring that Germany becomes the leading provider and leading market for electromobility.

One of the major aims which has been specified is to ensure that Germany has one million electric vehicles on the road by 2020. In order to ensure that this objective of the German Federal Government can be met, subjects which are particularly relevant for electromobility have been defined; these subjects are currently being considered in the working parties of the National Platform Electromobility (NPE). A key issue is the field of standardization and certification which is the responsibility of working group 4. If electromobility is to become a viable concept, user acceptance is a key factor of success in addition to technological progress. National and international standards encourage the convergence of technology, guarantee a defined level of quality and promote competition. Standards create transparency and establish trust among users. Accordingly, standards make a direct and indirect contribution towards ensuring that user acceptance of electromobility is enhanced.

In this context, DIN Deutsches Institut für Normung e.V. (DIN), Berlin, has engaged the services of Pricewaterhouse-Coopers AG Wirtschaftsprüfungsgesellschaft (PwC), Frankfurt am Main, to prepare a “study for determining the medium- to long-term standardization requirement in the field of electromobility on the basis of socio-economic developments”. PwC has carried out the engagement jointly with the Fachhochschule Frankfurt am Main – University of Applied Sciences, Frankfurt am Main, and the Fraunhofer-Institut für Betriebssicherheit und Systemzuverlässigkeit LBF, Darmstadt.

The socio-economic component is becoming an increasingly significant factor for the development of electromobility. For instance, extensive investigations have been carried out in the model region Rhein-Main regarding the mobility patterns of users and regarding the user acceptance of electromobility in order to take account of mobility requirements and the wishes of existing users in relation to the continuing development of electromobility. Four areas, which are mutually interrelated, are essentially considered under socio-economic aspects of electromobility:

1. Use of the masculine forms of user, purchaser, commuter, etc. also includes the female form.

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**Fig. 1: Socio-economic areas of electromobility**

- Principles of traffic behavior
- Propensity to pay
- Requirements and user expectations for electromobility
- Integration of electromobility in existing transport systems
- Transport environment design
- Vehicle safety
- Privilege
- Environmental law
- Data security
- Measuring instruments directive and related laws
- Cost development
- Economic business models
- Strategic partnerships
- Responsibility of ministries
- Political motivation and development measures in the international context

Source: PwC, Fraunhofer LBF, FH FFM (2011)
An analysis of secondary literature has been carried out for the areas of users, economy, politics and legal. Key subjects regarding the development of electromobility have been developed in this context (see Figure 1).

The corresponding technological factors and developments have been detailed on the basis of the analysis of secondary literature. The following SWOT analysis has been prepared using the results:

**Fig. 2 SWOT analysis**

**Strengths**
- Carbon-free travel possible
- Electric vehicle can significantly support the smart home concept, can be integrated in the smart grid
- Low noise emissions
- Fun to drive (acceleration)
- High level of comfort in urban areas
- Recharging activity can be combined with parking activity (no separate re-fueling activity)
- Low costs of operation and maintenance
- Improved active safety
- Ongoing standardization projects are supporting the process of overcoming various technical problems and the definition of safety questions

**Weaknesses**
- Insufficient range for longer journeys
- Days when vehicle is not available are a key decision-making factor in the purchase decision
- Interior air-conditioning is a limiting factor for the range
- Long recharging times
- High cost of purchase
- Low maximum speed compared with equivalent conventional vehicles
- Reduced mobile flexibility
- Technology and rescue chain hardly tested in practice
- Still a lack of convergence of standardization activities in different countries

**Opportunities**
- More ecological mobility behavior due to the use of inter- and multi-modal transport (public transport networks, Pedelecs, etc.) to compensate for range problems
- Reduction of emissions of fossil-fuel individual transport (noise, exhaust gases)
- Efficient use of fossil resources
- Transport costs decoupled from the international oil price development (after the energy industry converts to renewable energies)
- Considerable improvement in efficiency technologies
- Increasing comfort due to inductive recharging
- Petrol prices might rise more rapidly than electricity prices
- Creation of new services (e.g. mobility concepts) and revenue possibilities, e.g. for car infrastructure and IKT
- Uniform standardization boosts marketability

**Risks**
- The percentage of recharging electricity from renewable energies is too low to make electric vehicles more ecological (delay in the energy turnaround)
- Costs of purchase will continue to be too high
- Battery does not provide the performance which was originally promised (e.g. considerably reduced cycle stability, much reduced capacity under unfavorable climate conditions)
- Costs of “high-end” infrastructure are too high and have a significant impact on the TCO balance
- Savings effects in terms of operation and maintenance are eliminated by other costs
- Electricity prices might rise more rapidly than petrol prices
- Efficiency gains of conventional vehicles
- Other innovative technologies might become established
- Accidents with an electric vehicle (e.g. electric shock, collision with pedestrians) might lower user acceptance
- Lack of international standardization (e.g. as a result of different national interests) might reduce marketability due to insular solutions

Market penetration of electromobility will only be possible if the users accept the new technology and perceive it to be equivalent in comparison with other conventional and alternative drive technologies. Users will probably not discover electromobility in their entirety, and instead will in practice discover electromobility in a sequence of groups. Various factors, e.g. age, sex, education, background and upbringing, financial status, current life situation and surroundings (address and place of work) are relevant in this connection. Existing studies regarding the classification of user groups have been used as the basis of defining different user groups and making comments regarding their attitude with regard to various subjects of electromobility:

### Tab. 1: Profiles of different user groups

<table>
<thead>
<tr>
<th></th>
<th>Technology enthusiasts</th>
<th>Environmentally aware</th>
<th>Cost-aware</th>
<th>Safety-aware</th>
<th>Conservative</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cost</strong></td>
<td>o</td>
<td>o</td>
<td>++</td>
<td>+</td>
<td>++</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>++</td>
<td>o</td>
<td>+</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td><strong>Reliability</strong></td>
<td>o</td>
<td>+</td>
<td>+</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td><strong>Electricity mix instead of petrol</strong></td>
<td>++</td>
<td>—</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td><strong>Electricity from renewable energies</strong></td>
<td>+</td>
<td>++</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td><strong>Recharging with cable</strong></td>
<td>+</td>
<td>++</td>
<td>o</td>
<td>—</td>
<td>+</td>
</tr>
<tr>
<td><strong>Inductive recharging</strong></td>
<td>++</td>
<td>—</td>
<td>—</td>
<td>o</td>
<td>—</td>
</tr>
<tr>
<td><strong>Comfort</strong></td>
<td>+</td>
<td>o</td>
<td>+</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td><strong>Design</strong></td>
<td>++</td>
<td>o</td>
<td>o</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

**++** Very important  
**+** Important  
**o** Indifferent  
— Relatively unimportant  
— Completely unimportant

It can be seen that technology enthusiasts and the environmentally aware in particular will be among the first movers of electromobility. The existing results have been used to identify six factors which might potentially have a crucial impact on user acceptance and thus the market penetration of electromobility. Range, recharging infrastructure and costs are the factors which pose obstacles to the market penetration of electromobility. Specifically in the case of costs, most users will not be prepared to accept a significant mark-up on the purchase price compared with a comparable combustion vehicle. On the other hand, it is possible to counter the range fears of most users, even in the near future, by means of suitable public relations work/marketing, the range of hybrid concepts, an intelligent process of establishing a recharging infrastructure at suitable points and also appropriate business models (e.g. combined models, mobility card). In addition to these drivers, users expect that factors such as safety, reliability and comfort will not be affected by changing over to an electromobility solution. Many users consider that “green” mobility is an advantage of electric vehicles compared with conventional vehicles. Although this factor is very important for the image of electromobility, it has only limited scope to compensate for the disadvantages resulting from the factors of range and costs.

These six critical factors constitute the starting point for the development of two scenarios in the period of investigation (2015 to 2025). The expected time at which the user groups described above are prepared to convert to electric vehicles is also detailed. With the exception of the conservative users, all user groups detailed above will become electromobile during the basic scenario:

**Fig. 4 Scenario 1 - Base case**

- **2011**
  - First electric and hybrid cars launched on the market
  - Public sector projects and measures achieve broad public impact
  - Interest in user interest in electromobility
  - Recharging infrastructure opened at specific points
  - Technology enthusiasts and companies buy/lease initial cars
  - Car-sharing concepts and mobility chains turn electromobility into an experience for the user

- **2015**
  - Many electric cars on the market, battery costs fall
  - Recharging mainly at home and at work
  - Wall box integrated in concepts
  - Further recharging concepts ready for the market (DC, induction)
  - Operating costs much lower than in combustion vehicles
  - Emergency services prepared for electric vehicles

- **2020**
  - Implementation of vehicle-to-grid and smart-home concepts
  - Accidents during recharging and driving have only a minor impact on the ramp-up of electromobility
  - Technological development boosts reliability
  - Good conditions for use due to mild winters
  - Increase in the percentage of renewable energies in the electricity mix

- **2025**

**Source:** PwC, Fraunhofer LBF, FH FFM (2011).
Whereas market penetration of electromobility in the period covered by the investigation is assured in the basic scenario detailed above, a negative scenario is used to detail specifically those cases which might pose a threat to the market penetration of electromobility in the period covered by the investigation:

**Fig. 5 Scenario 2 – Negative scenario**

<table>
<thead>
<tr>
<th>2011</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market/technology preparation</td>
<td>Market ramp-up</td>
<td>Stagnation</td>
<td>Market recovery</td>
</tr>
</tbody>
</table>

- First electric and hybrid cars launched on the market
- Public sector projects and measures achieve broad public impact
- Interest in user interest in electromobility
- Recharging infrastructure opened at specific points
- Technology enthusiasts and companies buy/lease initial cars
- Car-sharing concepts and mobility chains turn electromobility into an experience for the user
- Many electric cars on the market, battery costs fall
- Recharging concepts ready for market (DC, induction)
- Costs of establishing the recharging infrastructure levied on the users – decline in acceptance
- Accidents involving electric vehicles with serious consequences (severely injuries due to burning batteries, diagnosis instruments inadequate, complications with transporting accident victims, rescue chain not tested)
- Media echo delays user acceptance of electromobility by several years
- Difficult conditions of use due to severe winters, user confidence in the reliability of the vehicles declines
- Conventional cars become much more environmentally friendly
- Increase in the percentage of renewable energies in the electricity mix
- Electricity price rises more rapidly than petrol price due to the energy turn-around
- Technological developments
- Public relations
- Implementation of vehicle-to-grid and smart-home concepts
- Necessary state development measures are implemented

Example
- Increase in sales of hybrid cars
- Sales of electric cars remain initially at a low level
- Many electric cars on the market, battery costs fall
- Recharging concepts ready for market (DC, induction)
- Costs of establishing the recharging infrastructure levied on the users – decline in acceptance
- Accidents involving electric vehicles with serious consequences (severely injuries due to burning batteries, diagnosis instruments inadequate, complications with transporting accident victims, rescue chain not tested)
- Media echo delays user acceptance of electromobility by several years
- Difficult conditions of use due to severe winters, user confidence in the reliability of the vehicles declines
- Conventional cars become much more environmentally friendly
- Increase in the percentage of renewable energies in the electricity mix
- Electricity price rises more rapidly than petrol price due to the energy turn-around

Subjects for which there might be a standardization requirement have been identified by using a filter developed for this purpose:

1. The subject is fundamentally relevant for electromobility
2. The subject will probably be relevant for electromobility in the period 2015–2025
3. The subject is not (or not comprehensively) considered in the German standardization roadmap

The standardization requirement has been defined on the basis of detailed observations of the identified critical factors and by applying the method of use cases for relevant sub-areas. Overall, it can be stated that many major issues – and in particular those issues which are relevant for safety purposes – have already been addressed in the German standardization roadmap and that standardization projects in many cases have already been actively processed or completed.

The six identified factors which will have a crucial impact on the market penetration of electromobility in the period under consideration have been subjected to a detailed analysis in order to identify those points at which standards might be of assistance. This has specified only suggestions which have previously not been the focal point of standardization activities regarding electromobility. Because the critical factors are crucial for the success of electromobility and user acceptance, the suggestions which are described should be included at an early stage in the individual standardization committees, where the contents should be set out in detail. The following table shows the critical factors to which the identified suggestions for standards have been allocated. The standard proposals cover a wide range of issues relating to the subjects of electric vehicle, (recharging) infrastructure and background conditions.
<table>
<thead>
<tr>
<th></th>
<th>Cost</th>
<th>Range</th>
<th>Recharging Infrastructure</th>
<th>Environment</th>
<th>Safety and reliability</th>
<th>Comfort</th>
</tr>
</thead>
<tbody>
<tr>
<td>A standard procedure for determining the current status and the expected outstanding capacity of used batteries.</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Standard and reliable measurement process for SOC/range prediction</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Standardized user interfaces</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Standardized model for Life Cycle-Cost/Total Cost of Ownership and Life Cycle Assessment</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noise catalog</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Basic status in the event of problems during the recharging process</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Periodic monitoring of home installations.</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rescue guidelines</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Measuring procedure/guideline for determining the residual risk due to batteries involved in accidents</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Definition of minimum requirements for quality in production processes</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Safety requirements for information and communication technology</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>IKT safety requirements</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Structural integration and barrier-free design of recharging infrastructure</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Guarantee of safety functions and other important functions when the main energy storage facility is empty. E.g. warning lights, eCall, safety facilities, door locking …</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Driving cycles adapted to electromobility</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Location of the recharging connector</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
</tbody>
</table>

The use case describes events from the point of view of the respective market roles and abstracts technical details. Defining the players, allocating them the respective roles, detailing the activities and limiting the system are major tasks which have a significant impact on the process of establishing a use case. The method of use cases thus logically breaks down an event into its individual steps. The purpose of a use case diagram is to understand the user requirements for a clearly definable event and to define interfaces.

The work of the standardization committees involves using the respective use cases to identify technical requirements for their particular area and to translate them into standards. At an early stage, use cases are thus able to detail events and describe plans which still have to be implemented in the relevant systems.

The method of use cases has been applied for six subjects, and the standardization requirement has been identified accordingly:

- Preparation of batteries for secondary use
- Home energy systems
- Authentication – RFID card, on demand
- Maintenance by remote diagnosis
- Rescue chain – accidents with personal injuries
- Self-diagnosis vehicle recharging infrastructure

### Tab. 3: Standardization requirement use cases “Preparation of batteries for secondary use”, “Home energy systems”

<table>
<thead>
<tr>
<th>Standard</th>
<th>Preparation of batteries for secondary use</th>
<th>Home energy systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serviceability standard</td>
<td>no standardization requirement identified (n. s. r. i.)</td>
<td>Ergonomic functionality and reliability of the recharging station</td>
</tr>
<tr>
<td>Delivery standard</td>
<td>n. s. r. i.</td>
<td>n. s. r. i.</td>
</tr>
<tr>
<td>Dimension standard</td>
<td>n. s. r. i.</td>
<td>Connections, connecting elements, devices for recognizing identification data, measurement of the state of charge of the battery</td>
</tr>
<tr>
<td>Planning standard</td>
<td>n. s. r. i.</td>
<td>n. s. r. i.</td>
</tr>
<tr>
<td>Quality standard</td>
<td>Test of performance</td>
<td>Long-time behavior of technical components and software (under normal and abnormal use)</td>
</tr>
<tr>
<td>Safety standard</td>
<td>Test of safety</td>
<td>Protection against manipulation, data security</td>
</tr>
<tr>
<td>Materials standard</td>
<td>n. s. r. i.</td>
<td>n. s. r. i.</td>
</tr>
<tr>
<td>Communication standard</td>
<td>Evaluation of test results</td>
<td>Declaration of the recharging point, functionality of the interfaces between the communication module and recharging point, data format, protocols, interfaces</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standard</th>
<th>Authentification RFID card</th>
<th>Authentification on demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serviceability</td>
<td>Ergonomic functionality and reliability of the interactive systems, barrier-free access,</td>
<td>Ergonomic requirements for interactive systems, barrier-free access to systems</td>
</tr>
<tr>
<td>Standard</td>
<td>guarantee of compatibility between communication module and recharging point</td>
<td></td>
</tr>
<tr>
<td>Delivery standard</td>
<td>Technical supply conditions of RFID readers, recharging station</td>
<td>Technical supply conditions</td>
</tr>
<tr>
<td>Dimension standard</td>
<td>Connections, connecting elements, facilities for recognizing identification data</td>
<td>Connections, connecting elements, devices for recognizing identification data</td>
</tr>
<tr>
<td>Planning standard</td>
<td>n. s. r. i.</td>
<td>n. s. r. i.</td>
</tr>
<tr>
<td>Quality standard</td>
<td>Efficiency, functionality, availability and correctness of the systems, long-term behavior</td>
<td>Efficiency, functionality, availability and correctness of the systems</td>
</tr>
<tr>
<td></td>
<td>of the technical components and software (under normal and abnormal use)</td>
<td></td>
</tr>
<tr>
<td>Safety standard</td>
<td>Protection against of the technical equipment, data security regulations for managing</td>
<td>Protection against of the technical equipment, data security regulations for managing</td>
</tr>
<tr>
<td></td>
<td>identities and master data</td>
<td>identities and master data</td>
</tr>
<tr>
<td>Materials standard</td>
<td>n. s. r. i.</td>
<td>n. s. r. i.</td>
</tr>
<tr>
<td>Communication standard</td>
<td>Identification of and operating instructions for technical components, communication</td>
<td>Identification, interfaces, protocols, data formats</td>
</tr>
<tr>
<td></td>
<td>protocols</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standard</th>
<th>Maintenance by remote diagnosis</th>
<th>Self-diagnosis vehicle recharging infrastructure</th>
<th>Rescue chain accident with personal injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Serviceability standard</strong></td>
<td>n. s. r. i.</td>
<td>Maintenance of the diagnosis instrument, test device for the cable (contact resistance – cable break)</td>
<td>n. s. r. i.</td>
</tr>
<tr>
<td><strong>Delivery standard</strong></td>
<td>n. s. r. i.</td>
<td>n. s. r. i.</td>
<td>n. s. r. i.</td>
</tr>
<tr>
<td><strong>Dimension standard</strong></td>
<td>n. s. r. i.</td>
<td>n. s. r. i.</td>
<td>n. s. r. i.</td>
</tr>
<tr>
<td><strong>Planning standard</strong></td>
<td>n. s. r. i.</td>
<td>n. s. r. i.</td>
<td>n. s. r. i.</td>
</tr>
<tr>
<td><strong>Quality standard</strong></td>
<td>Completeness of transferred data (checksum, etc.)</td>
<td>n. s. r. i.</td>
<td>n. s. r. i.</td>
</tr>
<tr>
<td><strong>Safety standard</strong></td>
<td>Encryption</td>
<td>n. s. r. i.</td>
<td>Regulations for ensuring that power is cut off; protection and rescue of personal data; procedure for discharging batteries; security of data (protected against unwanted access)</td>
</tr>
<tr>
<td><strong>Materials standard</strong></td>
<td>n. s. r. i.</td>
<td>n. s. r. i.</td>
<td>n. s. r. i.</td>
</tr>
<tr>
<td><strong>Communication standard</strong></td>
<td>Definition of interface, protocol, data format, uniform coding of vehicle information (e.g. encryption)</td>
<td>Definition of interface, protocol, data format, form of signal for functionality in the vehicle, signal of functionality on the recharging station</td>
<td>For E-call: identification as electric vehicle, simple and clear identification EV, uniform identification of circuit breaker, uniform rescue guidelines for the emergency services, uniform guidelines for the procedure with an electric vehicle involved in an accident for the breakdown recovery service and for the workshop</td>
</tr>
</tbody>
</table>

The standardization proposals which have been drawn up are the result of a socio-economic and technical discussion. The first aspect in particular has only been recognized to a limited extent in the standardization discussion which so far has tended to focus on technical aspects. The results of the study may therefore be an important component and signpost for future discussions relating to the standardization requirement and also for initiating standardization processes in electromobility, because they take account of the interests of all players (users, industry, etc.) and the technical requirements to describe the relevant standardization fields – in addition to the German standardization roadmap Electromobility. By developing standards based on the various proposals and also taking account of future developments and factors in the field of electromobility, it will be possible in the final analysis to shape a successful mass market in accordance with the period considered in the basic scenario.
Determining the Medium- to Long-Term Standardization Requirement for Electromobility Based on Socio-Economic Developments

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The information contained in this study was intended for our clients and correct to the best of the authors’ knowledge at the time of publication. Before making any decision or taking any action, you should consult the sources or contacts listed here. The opinions reflected are those of the authors.
About us
Our clients face diverse challenges, strive to put new ideas into practice and seek expert advice. They turn to us for comprehensive support and practical solutions that deliver maximum value. Whether for a global player, a family business or a public institution, we leverage all of our assets: experience, industry knowledge, high standards of quality, commitment to innovation and the resources of our expert network in over 158 countries. Building a trusting and cooperative relationship with our clients is particularly important to us – the better we know and understand our clients’ needs, the more effectively we can support them.

PwC. 8,900 dedicated people at 28 locations. €1.45 billion in turnover. The leading auditing and consulting firm in Germany.

Electromobility stemming from the link between competencies and resources from the automotive industry, energy consulting and the public sector
Electromobility poses enormous challenges for all of the parties involved, both in terms of how it affects strategy and operations. Our interdisciplinary team of experts bring many years of auditing and consulting experience from their respective sectors to the table – and work together with our clients on sustainable solutions targeted for their markets. PwC’s global network ensures access to our industry know-how at a local level and promises efficient project management based on uniform quality standards worldwide.

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