



3E - The German Perspective on Electric Mobility

E-Roaming in Germany and the EU

From isolated charging stations to a nation and European Union wide network

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E-Roaming in Germany and the EU

- 1 The Showcase Program
- 2 Status Quo
- 3 User Requirements and Use Case Descriptions
- 4 Describing the Solution within the Framework of the Showcase Interconnection
- 5 Technical Implementation of the Showcase Interconnection
- 6 Conclusion and recommendations



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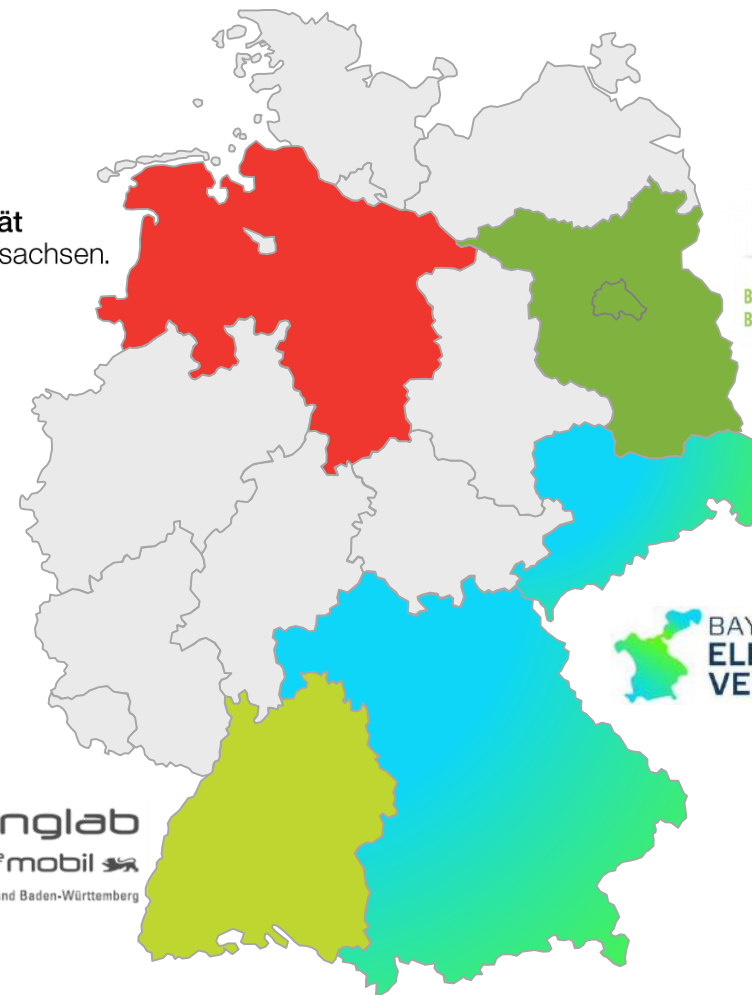


The e-mobility showcase program

- 4 showcases in 6 German states
- 145 projects (90 federally sponsored, 40 state sponsored, 15 associated federally sponsored)
- Duration 2012 – 2016
- Vehicles
 - 2.500 cars (90% BEV)
 - 1.000 pedelecs
 - 8 lightweight vehicles
 - 20 motorcycles
 - 65 busses
 - 71 commercial vehicles
 - 15 municipal vehicles
- 2.100 charging stations



eMobilität
in Niedersachsen.

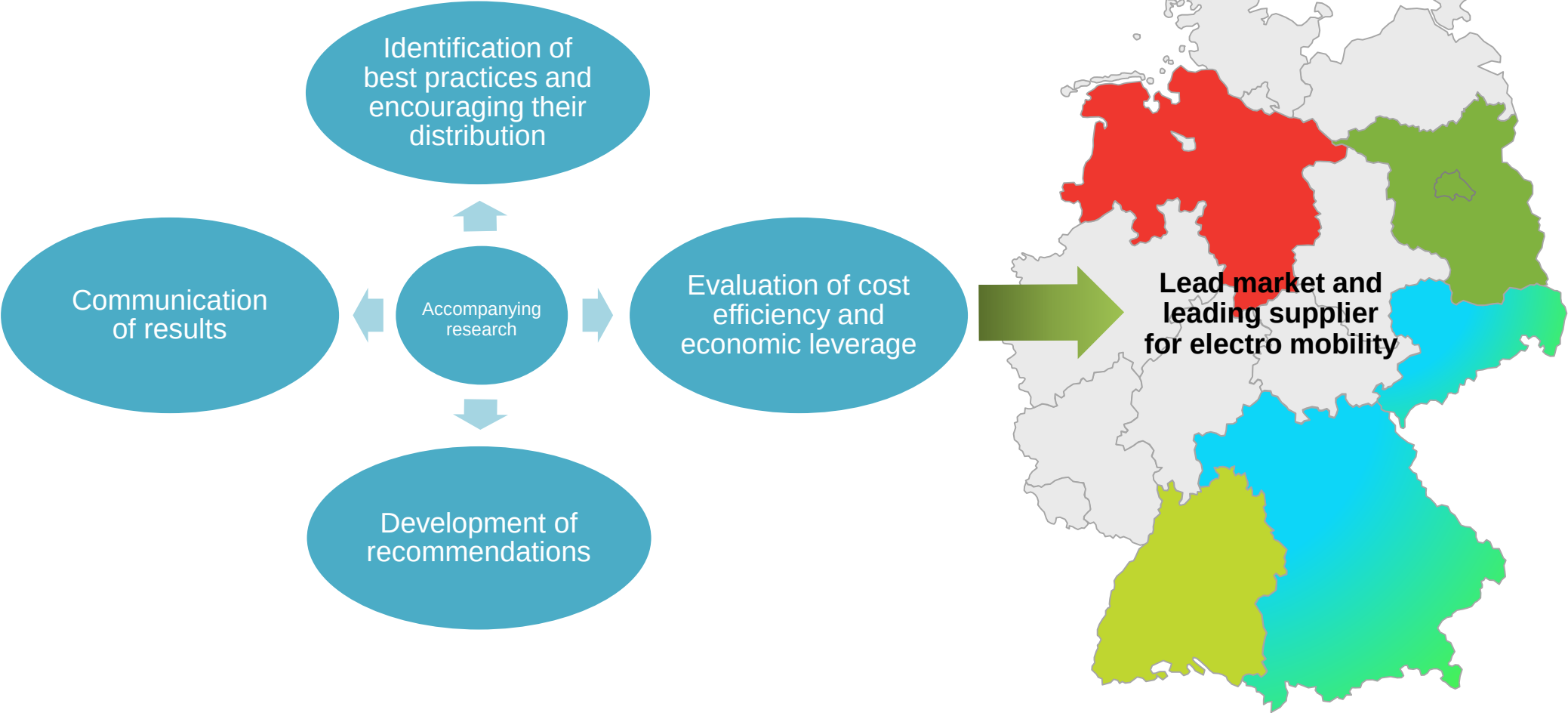


BAYERN – SACHSEN
ELEKTROMOBILITÄT
VERBINDET

livinglab
BW^e mobil 
Unterstützt durch das Land Baden-Württemberg

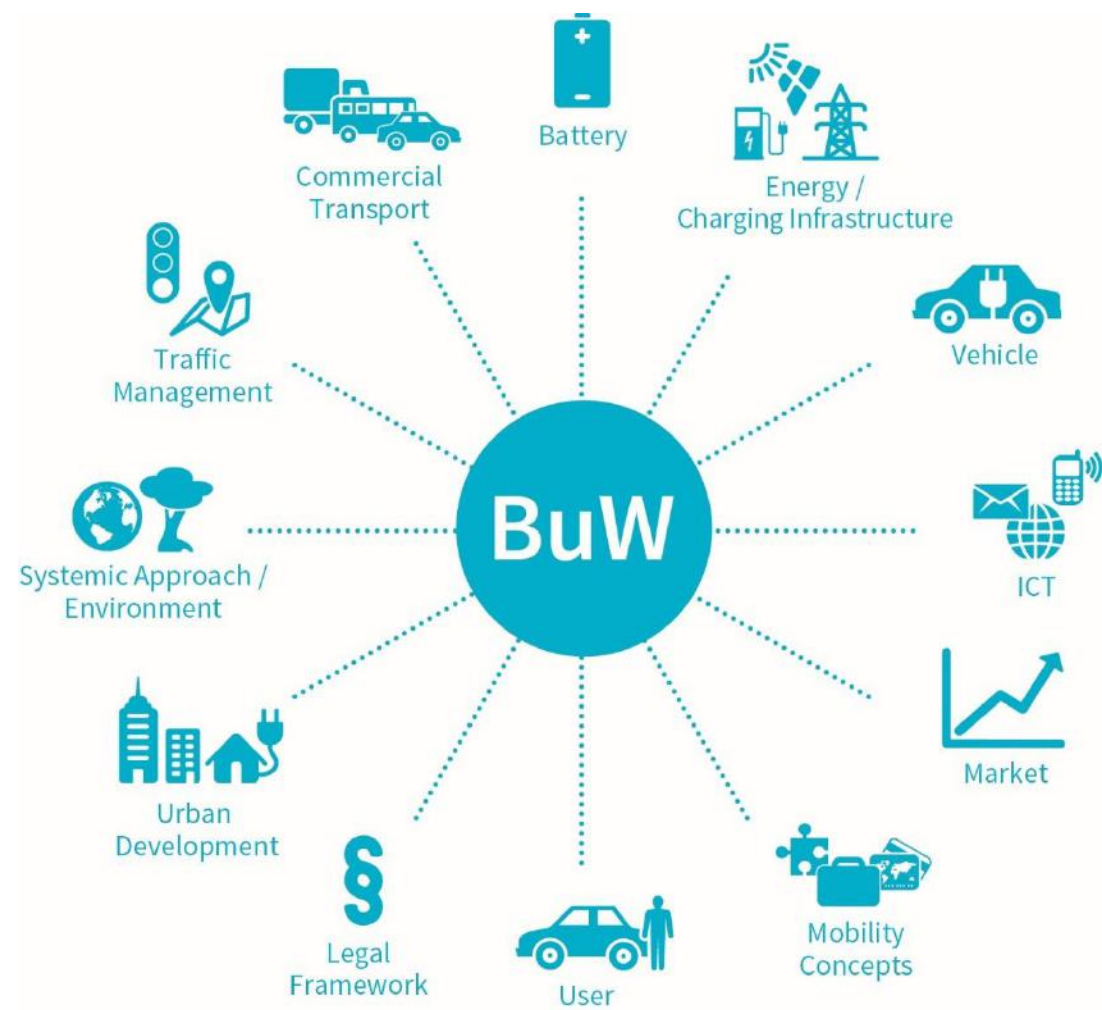


Objectives of the accompanying research





Shared Topics across Projects – E-Mobility Showcase





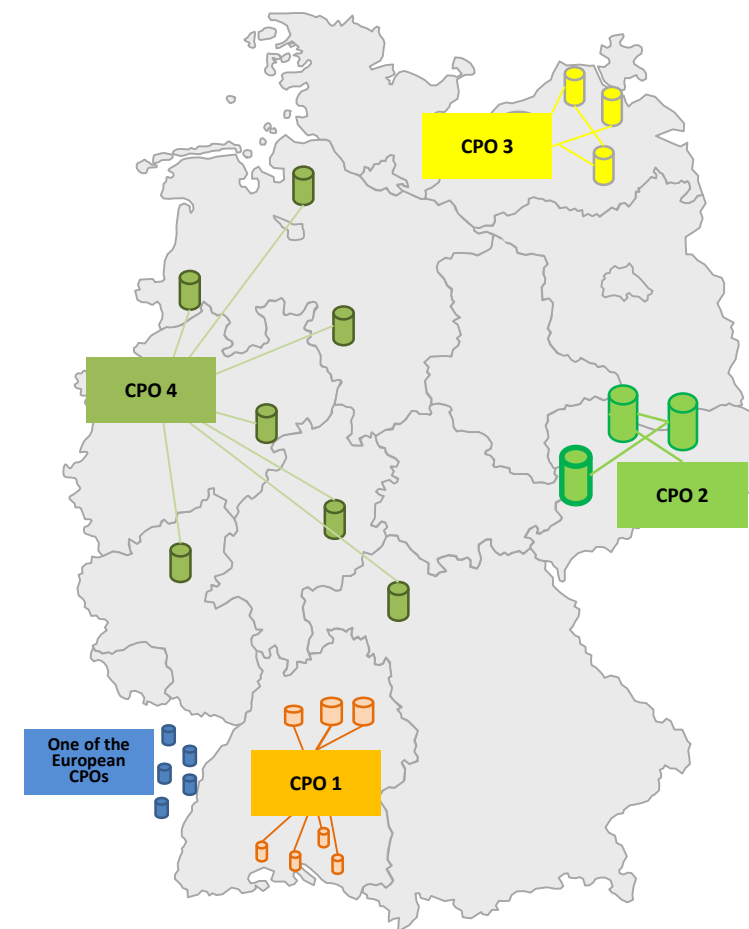
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The Situation prior to the E-Roaming Showcase

- By October 2014, there were some 950 charging columns with about 2,000 charging points in the four showcase regions.
- Outside the showcase regions were 1050 more charging columns
- They are all owned and managed by different charging station operators!
- We face the same problem all over Europe, as there are different CPOs and EMPs in each country





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User Requirements

1. The charging column has an ICT (internet) connection
2. The charging column is compatible with OCPP 1.5 (better OCPP 2.0) or offers similar features
3. The charging column has a local RFID card reader and/or a function for remote activation



Use Case Descriptions

1. Every customer of platform A should receive access to all charging columns of platform B
2. To this end, the customers of platform A should be able to:
 - a. Find charging columns of platform B via an app or a website and determine their status based on dynamic POI data sent to platform A by platform B
 - b. Activate platform B charging columns using an RFID card
 - c. Activate platform B charging columns using an app
 - d. Receive a bill of the charging process, based on a Service Detail Record, which is sent from platform B to platform A

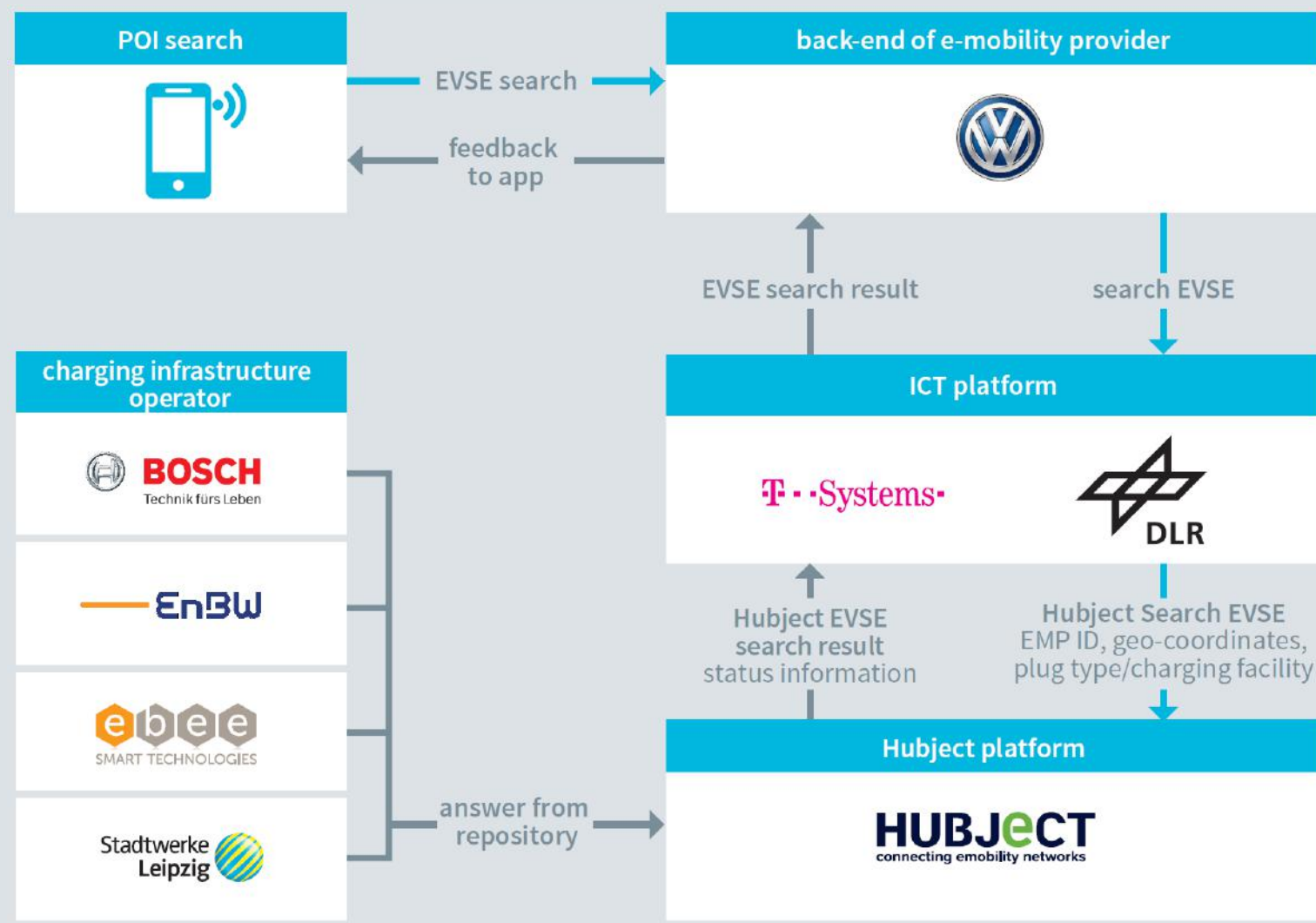


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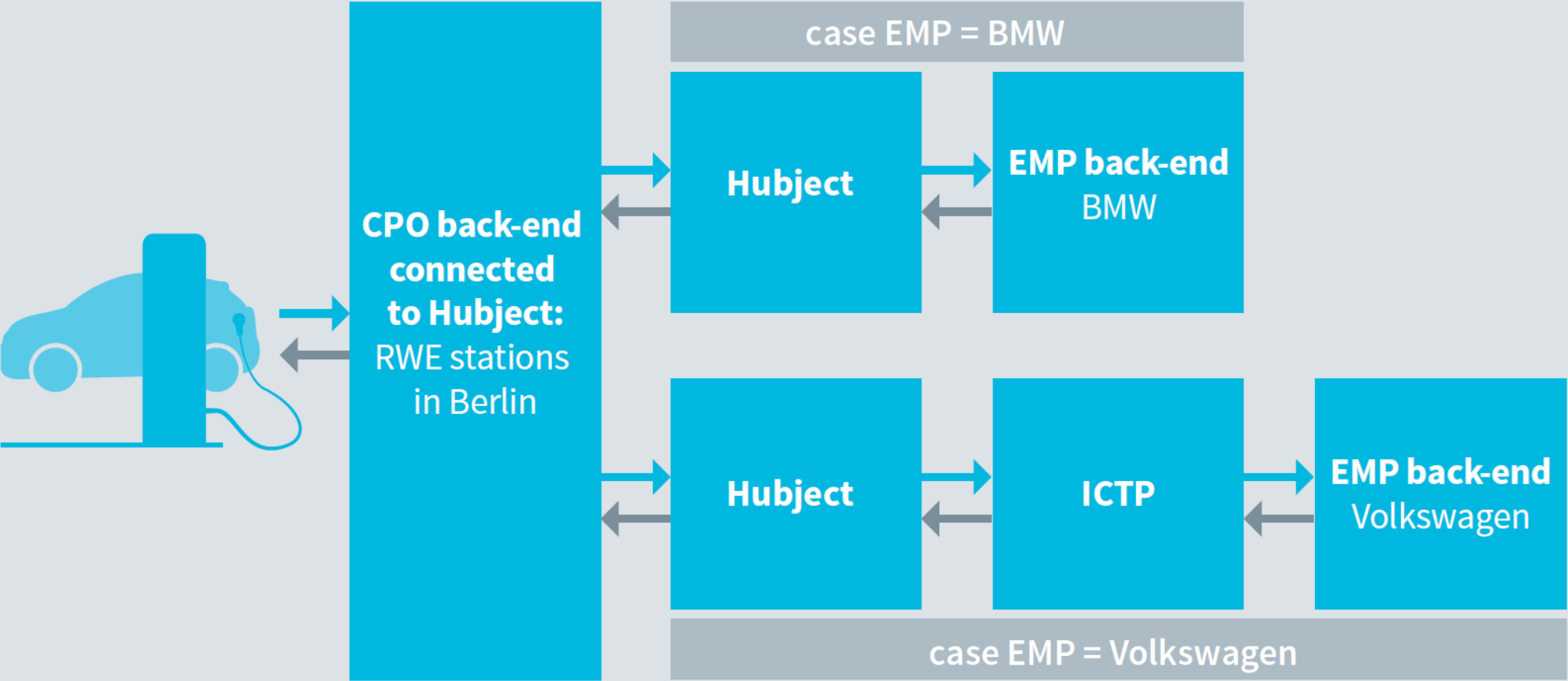


Example Use Case: Search for a POI





Example Use Case: Remote authorization at a charging infrastructure via the interchange platform



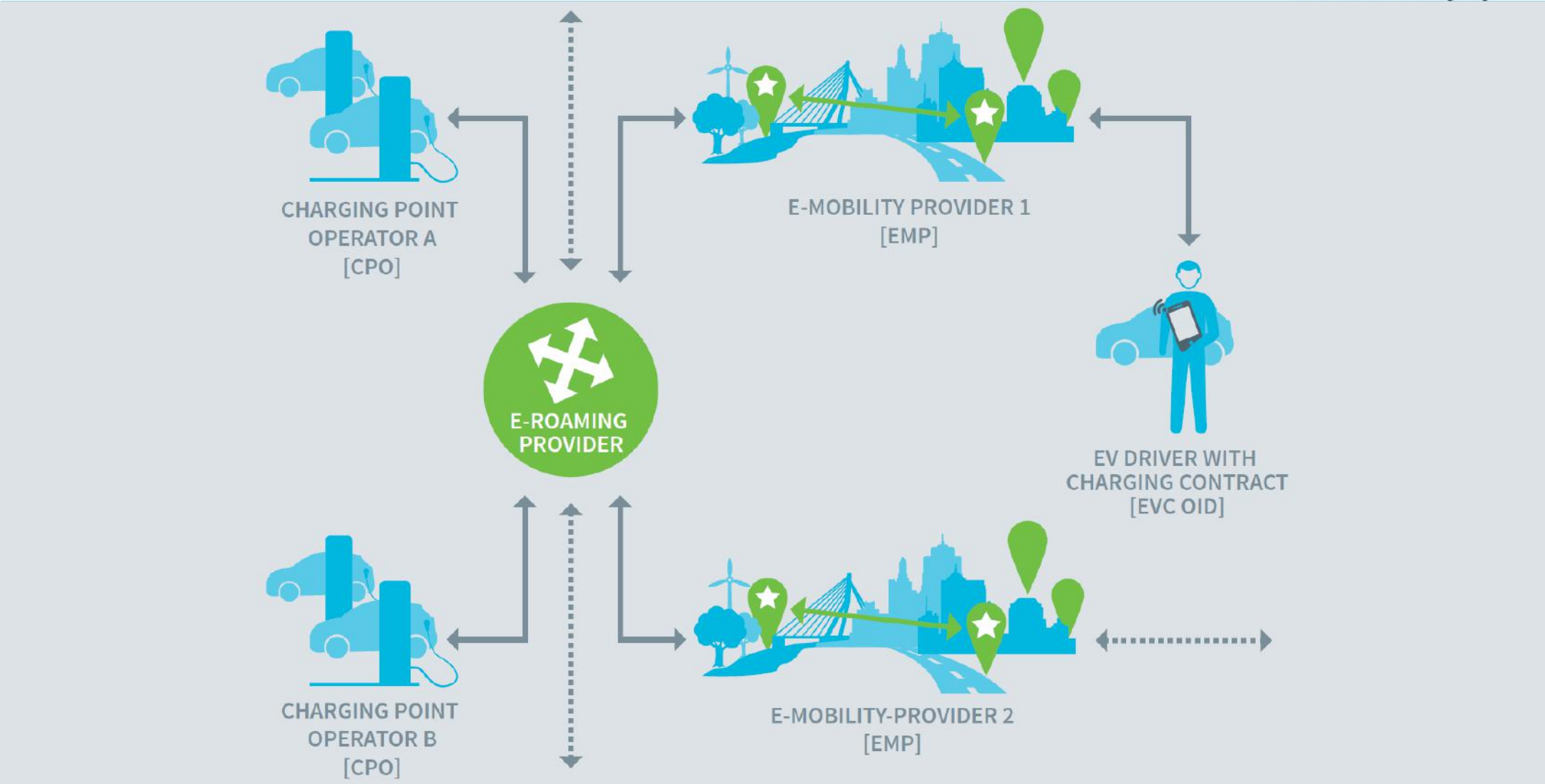


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Relevant Roles in E-Roaming





Unique Identification of EVSE and User

Charging Infrastructure

- EVSE ID
- DE*A23'*E45B*78**C**

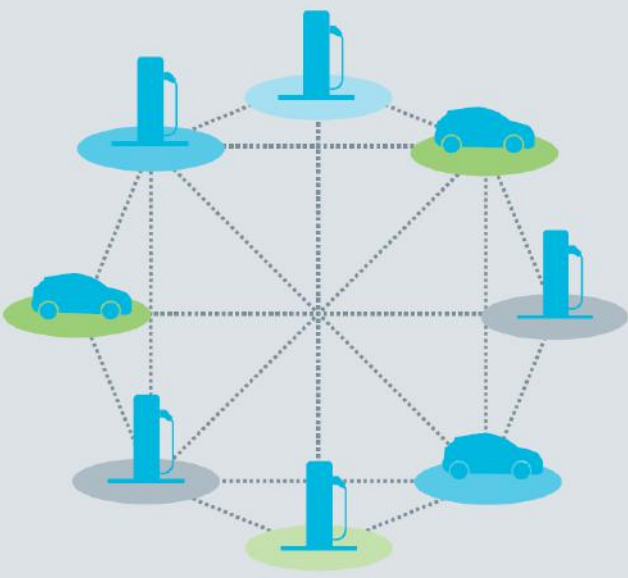
User

- EVCO or EMA ID
- DE*A34'*E32G*92**E**

Since 2014 these IDs are used according to the
ISO 15118-2:2014 – Appendix H



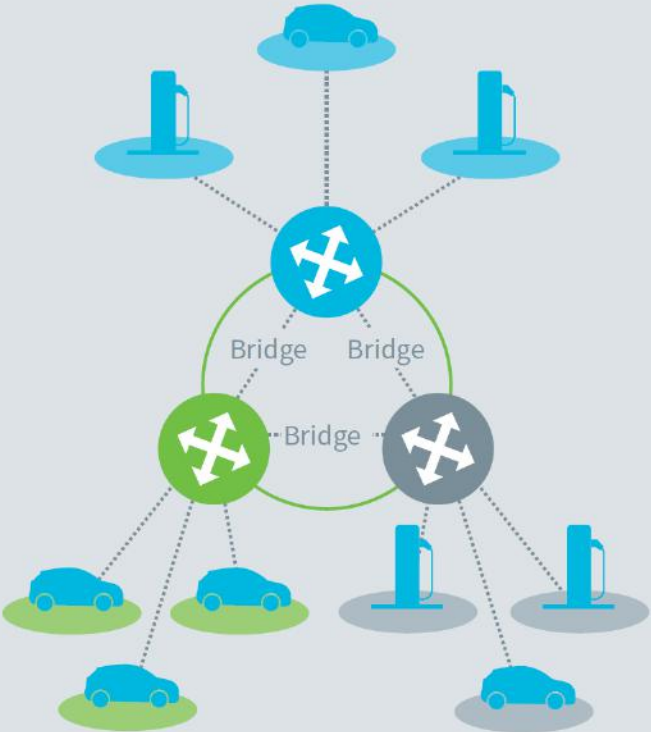
Models of Cooperation in E-Roaming



Meshed Network



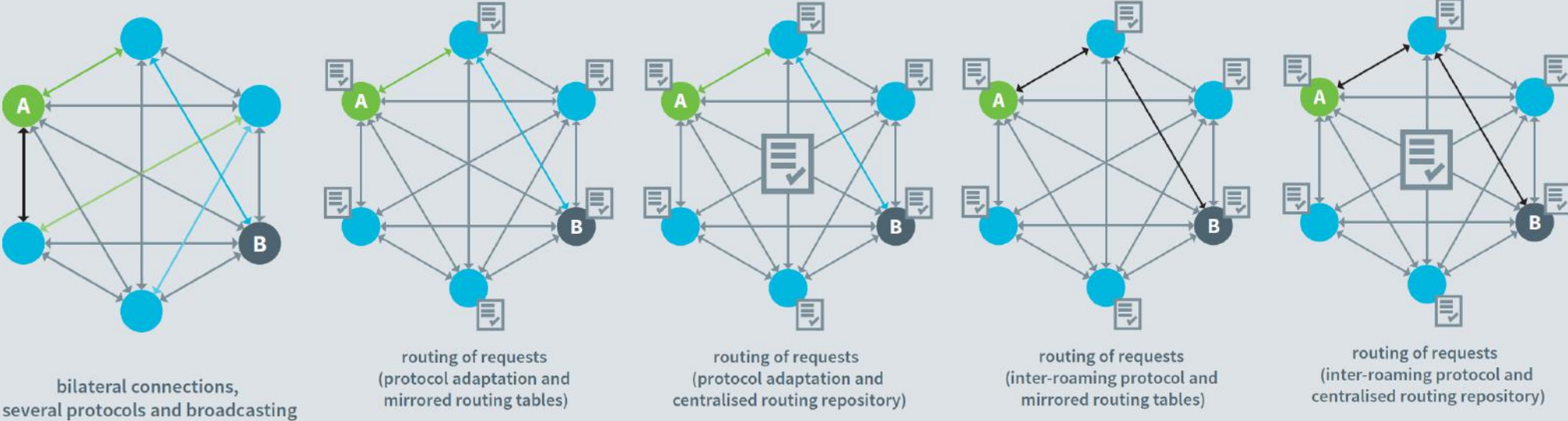
Hub and Spoke Model



Spoke Model „Interroaming“



Models for Technical Communication between E-Roaming Providers





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Conclusion and recommendations

- The parties involved in interconnecting the charging infrastructure should organize their cooperation in an extended Spoke model
- A multi-platform approach, using integrated routing tables and a jointly defined inter-roaming protocol, can simplify the technical communication between e-roaming providers
- E-roaming platforms must ensure a high level of security, high robustness, and quick reaction times



Conclusion and recommendations

- Charging points, providers and end users must be bijective identifiable and a transaction ID is necessary that cannot be altered
- All charging points and their providers should provide dynamic POIs so end users can quickly find and reliably reserve the charging points
- In addition to providing interoperability, all charging stations should offer ad-hoc access for users without a contract



Thank you for your attention!

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Menschen Methoden Lösungen

