Project CROME: Our Contribution for an E-Mobility World without Frontiers

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Public Project Funding Partners

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Bundesministerium für Verkehr, Bau und Stadtentwicklung

aufgrund eines Beschlusses des Deutschen Bundestages

Organized by  
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Main EnBW Achievements of the Project

- Installation of 25 CROME-specific interoperable charging stations
- Administration and management of the CROME local energy suppliers (Stadtwerke Karlsruhe, E-Werk Mittelbaden, Stadtwerke Baden-Baden & star.Energiewerke Rastatt) including EDF in the EnBW Back-End-System
- Development of an RFID-Card System (EnBW / local suppliers) for customer and partner billing
- Development of differentiated tariffs for partners and customers
- Development and implementation of a roaming system and display of the corresponding tariff on the charging station
- Authorization of French RFID-Cards on German charging stations and consumption information of the charging processes
Geographical Focus on Karlsruhe and Southern Rhine Valley

**Roll out regions**

- The market entry occurred in regions in which charging stations are already installed (about 300 stations in the regions Stuttgart, Karlsruhe) with extension to southern Rhine valley
- Further development takes place successively in other charging infrastructure development projects throughout Baden-Württemberg
Main components EnBW: RFID-Card

**CROME RFID-Cards**

**Main contents**

- The RFID card grants independence and security: it allows accessing currently about 300 charging stations in Baden-Württemberg with around 600 charging points. One of the largest charging networks in Germany.
- The card can be used for access and payment at the charging stations. The client receives a monthly bill for all charging sessions.
- Every local supplier can provide his own RFID-Card with its specific branding.
Main components EnBW: RFID Card – Post Paid

**Elektronauten Ladekarte für 4-Räder**

<table>
<thead>
<tr>
<th>Ladekosten</th>
<th>Spar-Zone</th>
<th>Basis-Zone</th>
<th>Hot-Spot-Zone</th>
<th>Upgrade Viel-Lader Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grundpreis</td>
<td>9,90 €/Monat</td>
<td>2 €/h</td>
<td>3 €/h</td>
<td>75 Cent/h</td>
</tr>
<tr>
<td>Spar-Zone</td>
<td>max. 1 €/h</td>
<td>max. 15 Cent/h</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basis-Zone</td>
<td>2 €/h</td>
<td>50 Cent/h</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hot-Spot-Zone</td>
<td>3 €/h</td>
<td></td>
<td>75 Cent/h</td>
<td></td>
</tr>
<tr>
<td>Upgrade</td>
<td></td>
<td></td>
<td></td>
<td>Für 5 € im Monat ab der 5. Anschluss-Stunde nur noch 25 Cent/h</td>
</tr>
<tr>
<td>Viel-Lader Option</td>
<td></td>
<td></td>
<td></td>
<td>Für 5 € im Monat ab der 7. Anschluss-Stunde nur noch 25 Cent/h</td>
</tr>
</tbody>
</table>

Erstlaufzeit 12 Monate, danach monatliches Kündigungsrecht
Main components EnBW: RFID Card - Prepaid

Prepaid RFID-Card

- No registration needed
- Easy to use

Main contents

- Access to all EnBW- and authorized EDF-/ CROME charging stations
- Prepaid-Card with up to 50€ credit
- Full cost control
- No specific contractual obligations
- Prepaid-Card is available in all EnBW-outlets and online
- Developed in the e-mobility project iZEUS and usable in CROME
Main components EnBW: Backend System

- Each energy supplier has an exclusive contractual relationship to the client
- Each energy supplier can define its own pricing model for public charging
- Each energy supplier invoices to its own clients (EnBW provides all charging information)
- EnBW and each energy supplier subscribe a license agreement
Main components EnBW: Backend - Charging information for suppliers and customers

- **Real client billing system**
  Each EnBW-partner and customer receives a detailed monthly overview of all charging processes

- **Billing / roaming system with different connected energy suppliers**
  Each EnBW-partner receives a detailed overview of its own customers, no matter where the charging station is located

- **Transparent charging information**
  Pricing is displayed on the charging station

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<table>
<thead>
<tr>
<th>Stationnummer</th>
<th>Ort/ Tarifzone</th>
<th>Stecker</th>
<th>Tarif</th>
<th>Beginn</th>
<th>Ende</th>
<th>Anschlussdauer</th>
<th>Ladekosten (netto)</th>
<th>Ladekarten Nr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>794</td>
<td>EWM Freiburgerstr. 23a, / Wasserstr.Betriebsverwaltung des E-Werk Mittelbaden 77652 Offenburg Zone: Basis-Zone</td>
<td>Turbo-stecker</td>
<td>1,68 €/h</td>
<td>08.08.2012 09:54</td>
<td>08.08.2012 16:41</td>
<td>05:46</td>
<td>9,69 €</td>
<td>98</td>
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<tr>
<td>Anzahl der Ladevorgänge</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>gesamt</td>
<td>05:46</td>
<td>9,69 €</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Main components EnBW: Additional services

- Development of an EnBW charging station app for iPhone (Apple iOS)
- Additional feedback channels for customer experience issues via Facebook and Twitter
- Design and development of an additional questionnaire including specific cross-border traffic related questions (launch tbd.)
Additional development: Link to Hubject

- Each Hubject customer can charge at EnBW and EnBW Partner stations
- Soon: Each EnBW and EnBW Partner Customer can charge at Hubject Charging Stations
Learnings:

- Cross Border E-Mobility is possible and reality today
- Technology for roaming is fully functionable
- E-Mobility needs now attractive electric vehicles to break through
- Customers accept RFID card for authorization and payment
- Installation and management of public charging infrastructure is costly
- European wide standards for further deployment of e-mobility is crucial

Conclusions:

- E-Mobility will make its way to success within the next decade
- E-Mobility will not replace conventional cars, but will enrich existing vehicle mix
- Political support is needed for development of charging infrastructure
- EnBW will be at your side when developing e-mobility projects