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CMO- CLEAN Motion Offensive

Conference Alternative Propulsion Systems and Energy Carriers - Vehicle
Integration and System Optimization
2010-11-18/19



Company Profile - History and Philosophy



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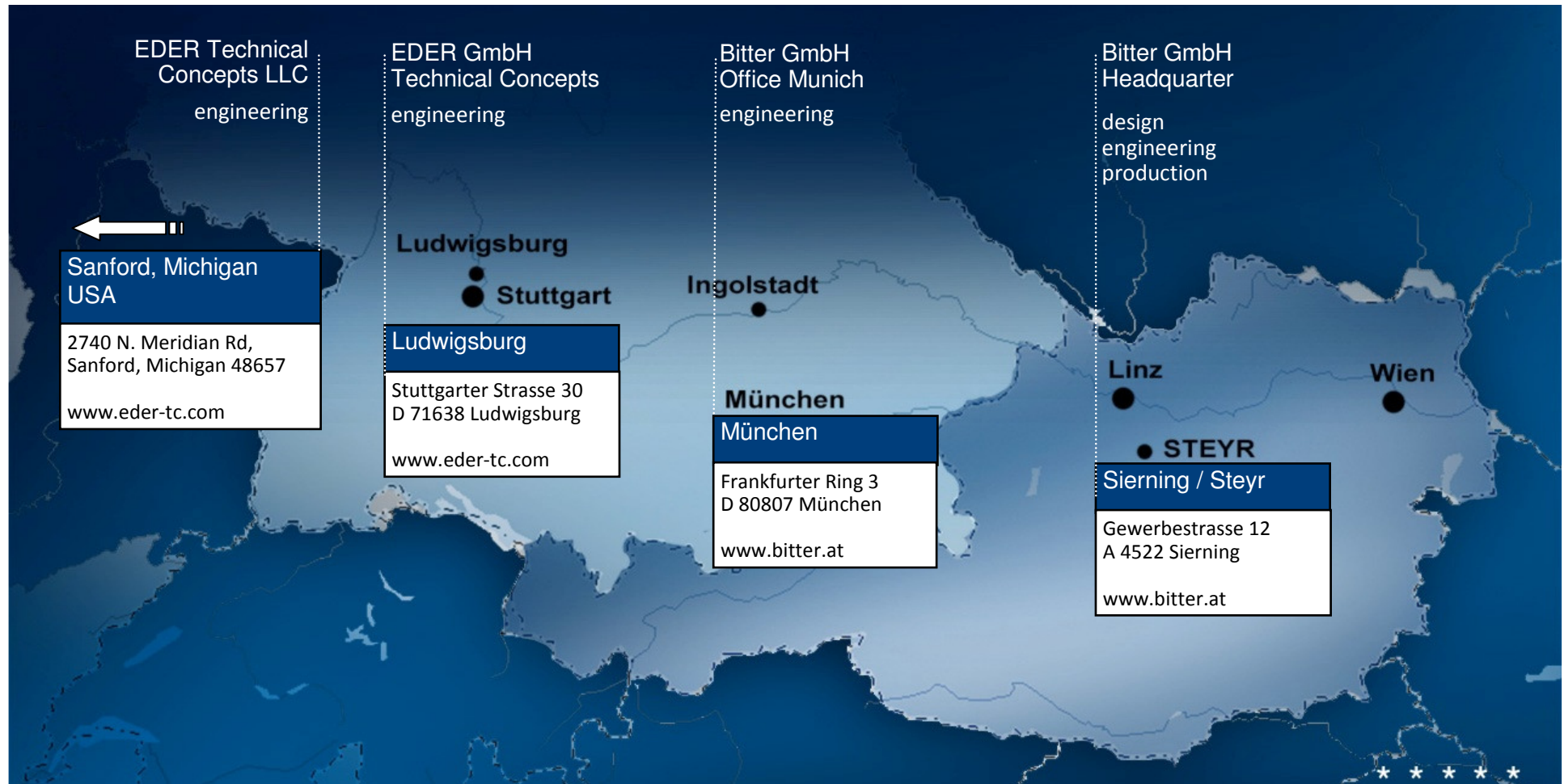
The Bitter Group was founded in 1989 as an **engineering office dedicated to the automobile industry**. Meeting the philosophy of customer's proximity and a total support on location, new branches have been founded in the last ten years in Germany (Ludwigsburg, Munich), as well as in Detroit, USA. Currently, with all branches together we sum up **120 specialists** worldwide. The experience, gained during the years developing components for automotive engineering, mechanisms, parts, modules, projecting, motor and vehicle engineering has been clearly demonstrated. For that matter, we cover all fields from styling, design through simulation and testing until prototype sourcing.



Company Profile - Locations



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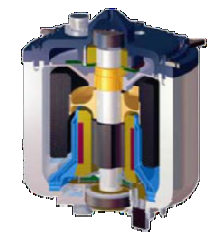


Existing Developments in Hybrid- and E-Mobility



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- Steyr 1050 Running-Chassis – *TIC Steyr, Bitter, Automotive Solutions, LKR*
- Haidlmair E3 – *Haidlmair, Bitter*
- ETS – *Bitter, KEBA, Automotive Solutions*
- HyCart – *Bitter, Cardec*
- Ladestation – *KEBA*
- PP-Raza – *TIC Steyr, Haidlmair, TCKT, Bitter*
- *LWE Central Unit – Lightweight Energy, Ginzinger*



Project CMO – The Targets



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- CMO is a project of the 2nd Call Electromobility's technical beacons powered by the Austrian Climate and Energy Fund.
- CMO thus concentrates on substantial technical and systemic development paths, especially
 - Increasing the ranges by means of innovative range extenders
 - Development of electrically driven vehicles for special niche applications
 - Cost reduction by using batteries with technical and commercial innovation
- Testing of possible variants of the —Intelligence distribution in the system (intelligent battery system, intelligent vehicle, intelligent charging station, intelligent load distribution, intelligent network and smart metering)
- Integration of the rechargeable batteries into the smart grid and the billing systems via telematics
- New types of current collectors

} smart CleanCar

shown in this presentation



CMO – The Consortium



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- 13 Companies and Institutes
 - 4 Small Enterprises
 - 2 Medium Enterprises
 - 2 Large Enterprises
 - 2 R&D Institutes
 - 1 energy supplier
 - 1 Science Park
 - 1 Cooperation Competence Center



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Automation by innovation.



- Excellent Know-how in all areas relevant to E-Mobility
- Optimal integration of R&D-Structures
- Integration of SMEs.

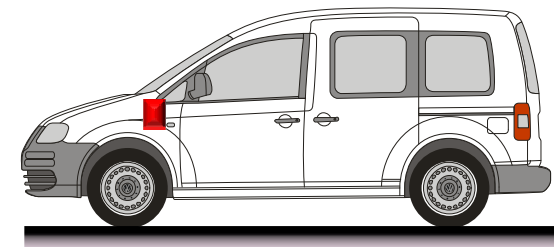
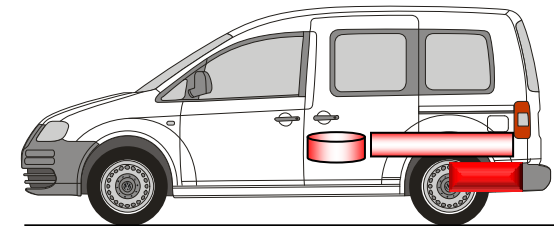


smart CleanCar



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- Existing e-cars can be enhanced and upgraded in 3 areas.
 - **Area 1** - Additional power supply (additional power storage (replaceable), Range-Extender, Fly-Wheel)
 - **Area 2** - A charging interface which replaces the usual plug-ins by a mechanical interface (conductive charging)
 - **Area 3** - An information portal, which informs the battery supplier about the status of the battery set. (mobile communications)

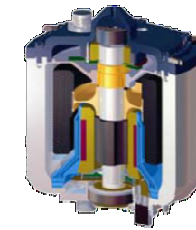
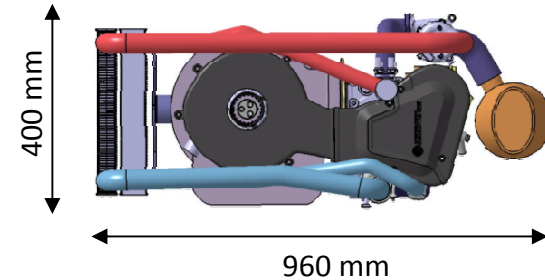


Area 1 – Range Extenders



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- Diesel-REX
 - 2 cylinder, 4-stroke, Diesel-Engine
 - 25 kVA, 85kg
- Fly Wheel
 - Energy Content: up to 1 kWh
 - Charging/Discharging-Power: ~ 50 kW
 - Weight: ~ 100 kg
 - Rotation Speed: ~ 50000 min⁻¹
- Hybrid Battery
 - Different Cell-Types
 - One Battery-Management System



Area 2 – Charging



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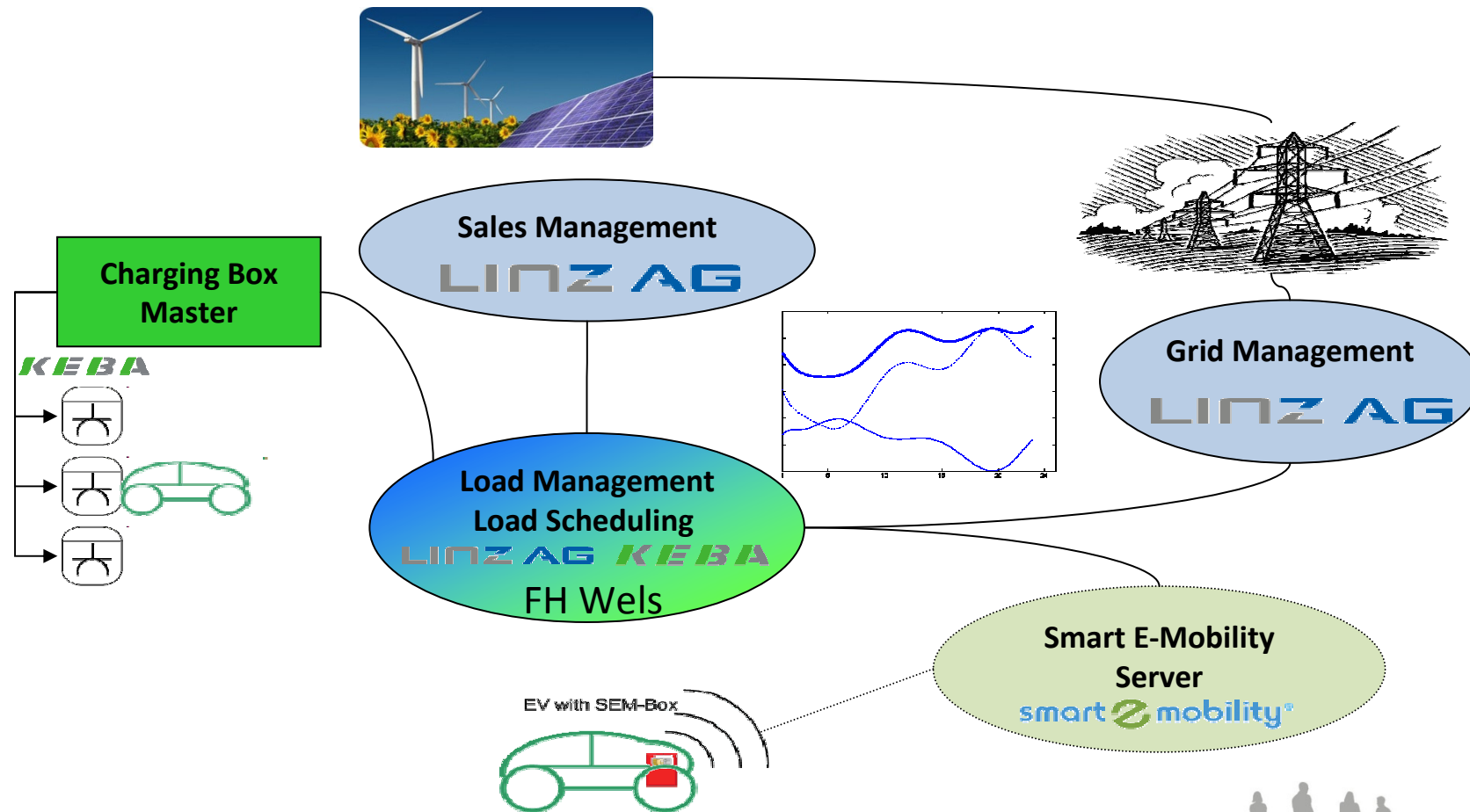
- Charging Box (Master)
 - Easy2Use
 - Drive-In
 - Charge
 - Pay



Area 2 – Charging System smart CleanPower



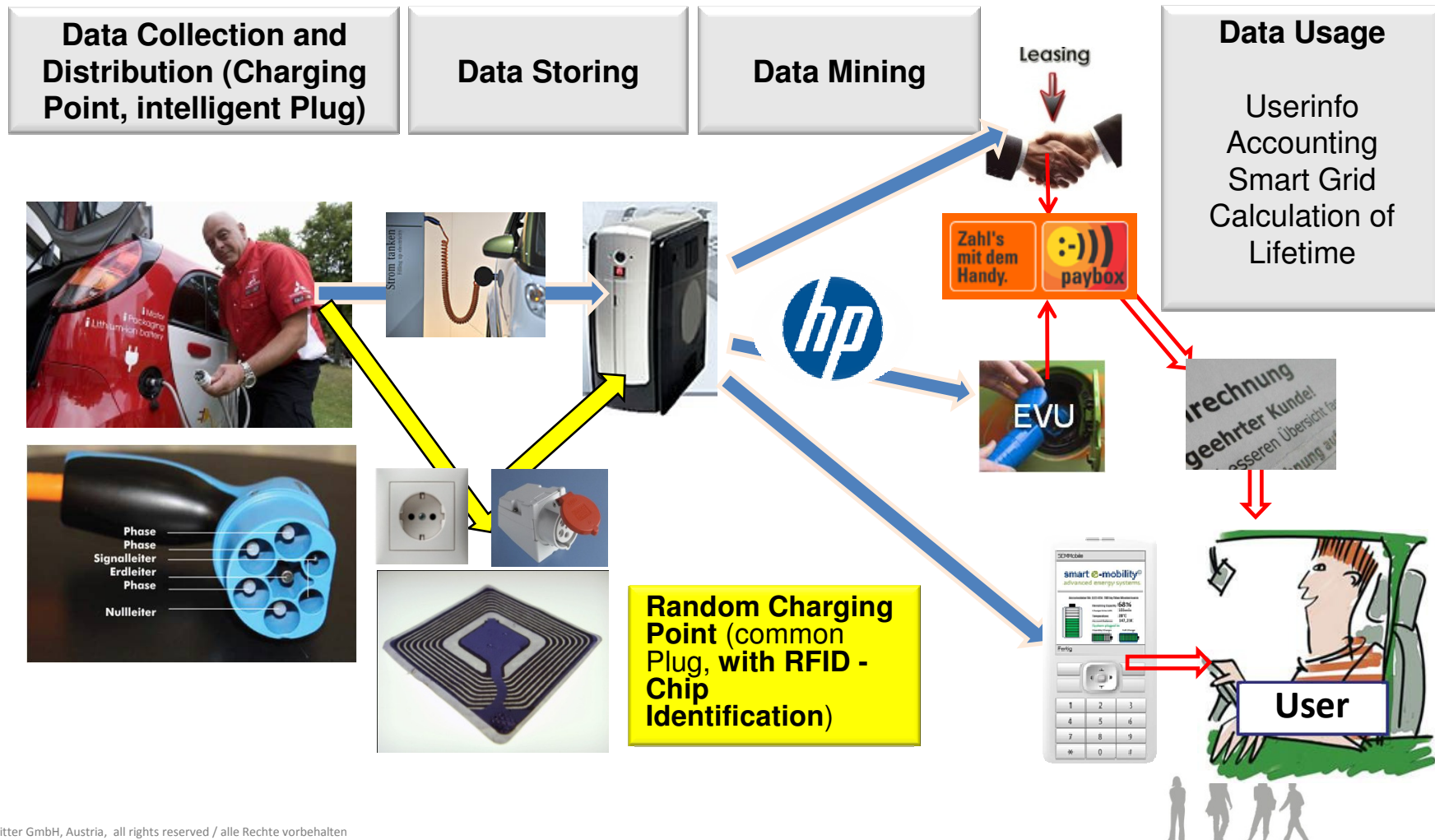
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Area 3 – Communication Interface



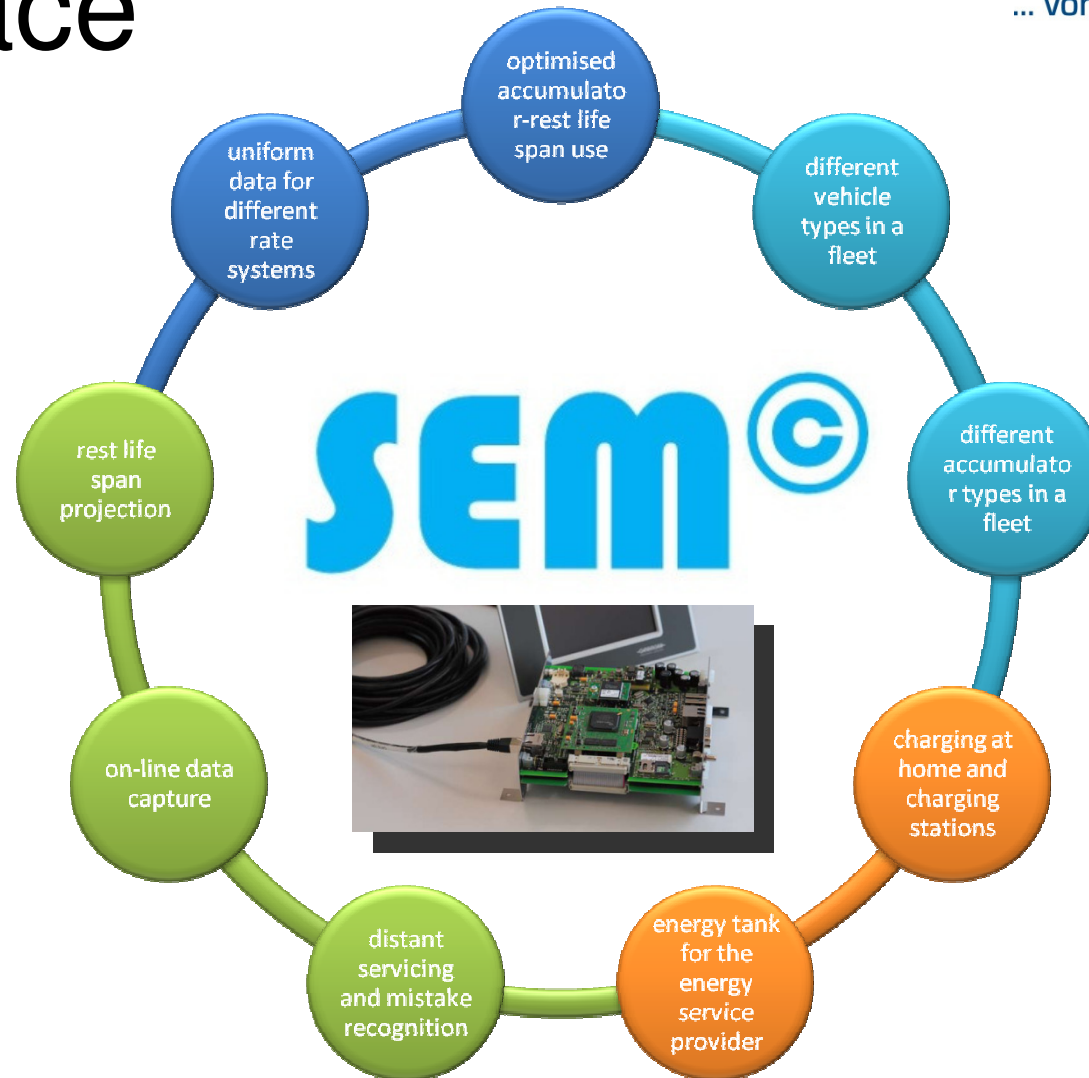
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Area 3 – Communication Interface



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Conclusio CMO



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- Maximum cost effectiveness for user
- Technical Developments for Easy2Use
- Research impact from Fleet-Applications to Grid
- Develop Load Management System





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thank you for showing initiative

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