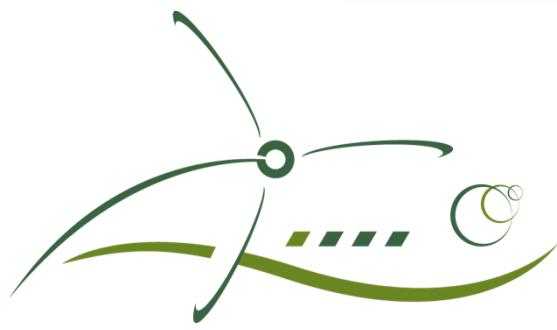




# ELECTROMOBILITY SOLUTION FOR CITIES AND REGIONS

Alexandra David & Dr. Rolf Reiner / ELMOs project



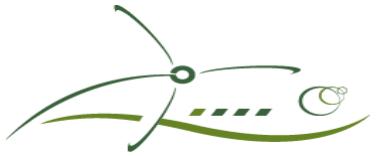
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## Overall Goal

### ELMO's overall goal:

to promote more sustainable transport through the development of electromobility solutions for cities and regions.

*A Regions of Knowledge project under FP7*

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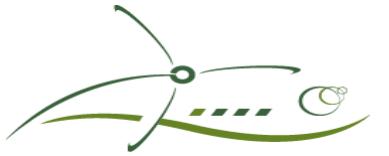


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# Project Objectives

## I. Paradigm Shift: From Ownership to Usage

Development of concepts for future business models able to create new mobility patterns in urban environments.

## II. Cross-border Field Tests

Design of cross-border field tests to demonstrate state-of-the-art in technology and infrastructure, to identify further research needs and to analyse acceptance by users.

## III. Joint Action Plan

Elaboration and adoption of a cross-border action plan to strengthen the research and knowledge base and contributing to competitiveness of European «mobility industries».

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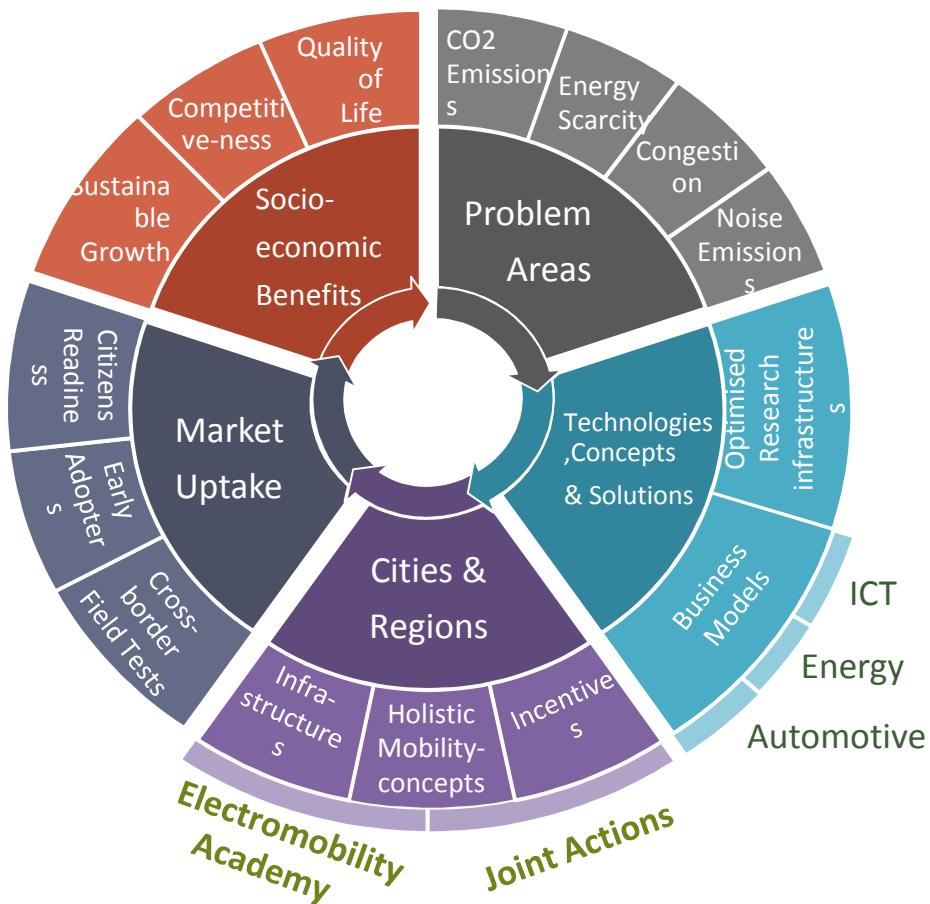


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## ELMO<sup>s</sup> Concept – Social Economic Benefits



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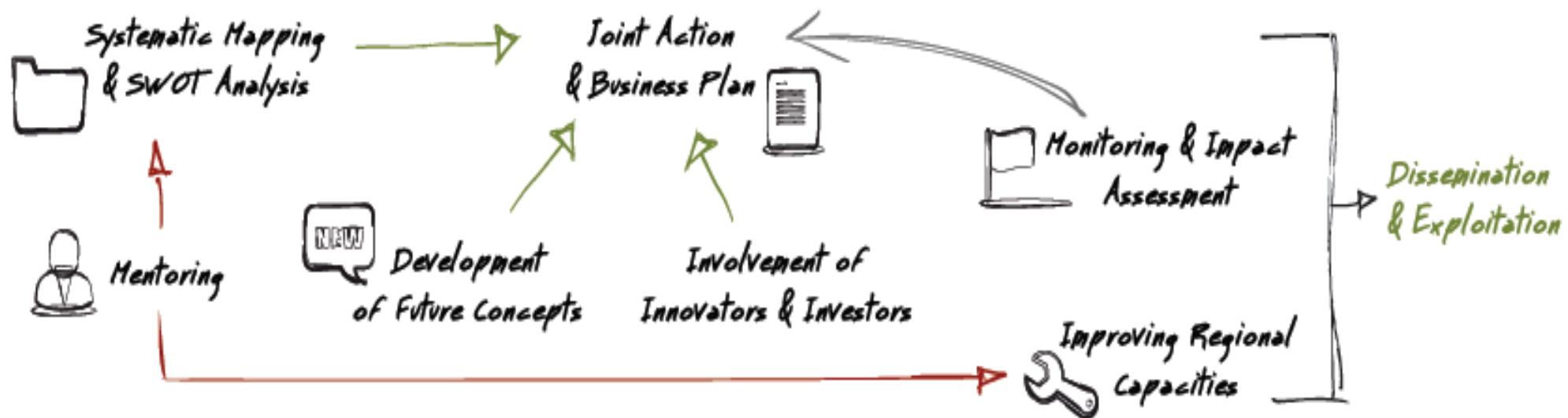


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## ELMOs Workplan



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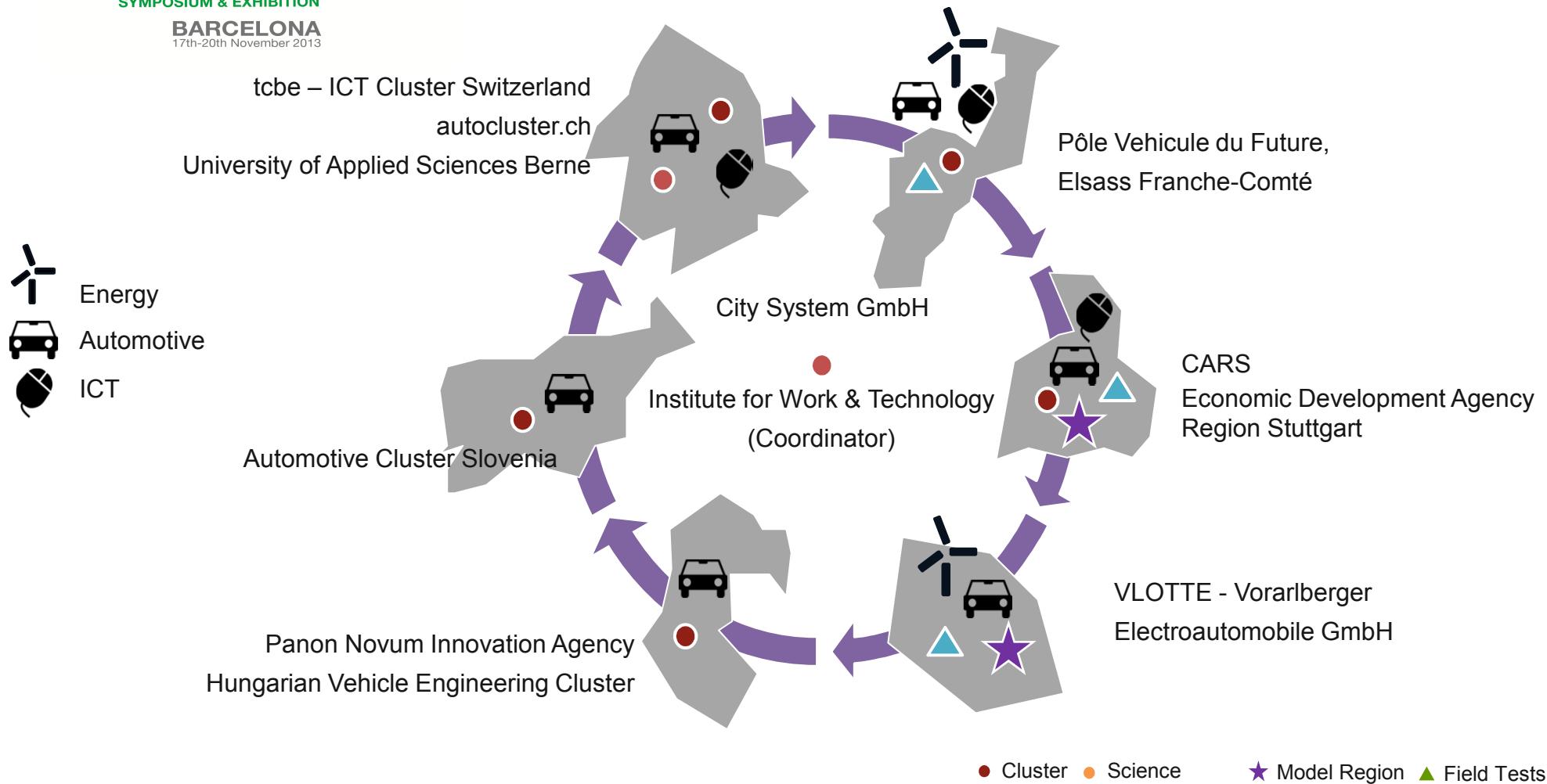
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## Partner & Competences



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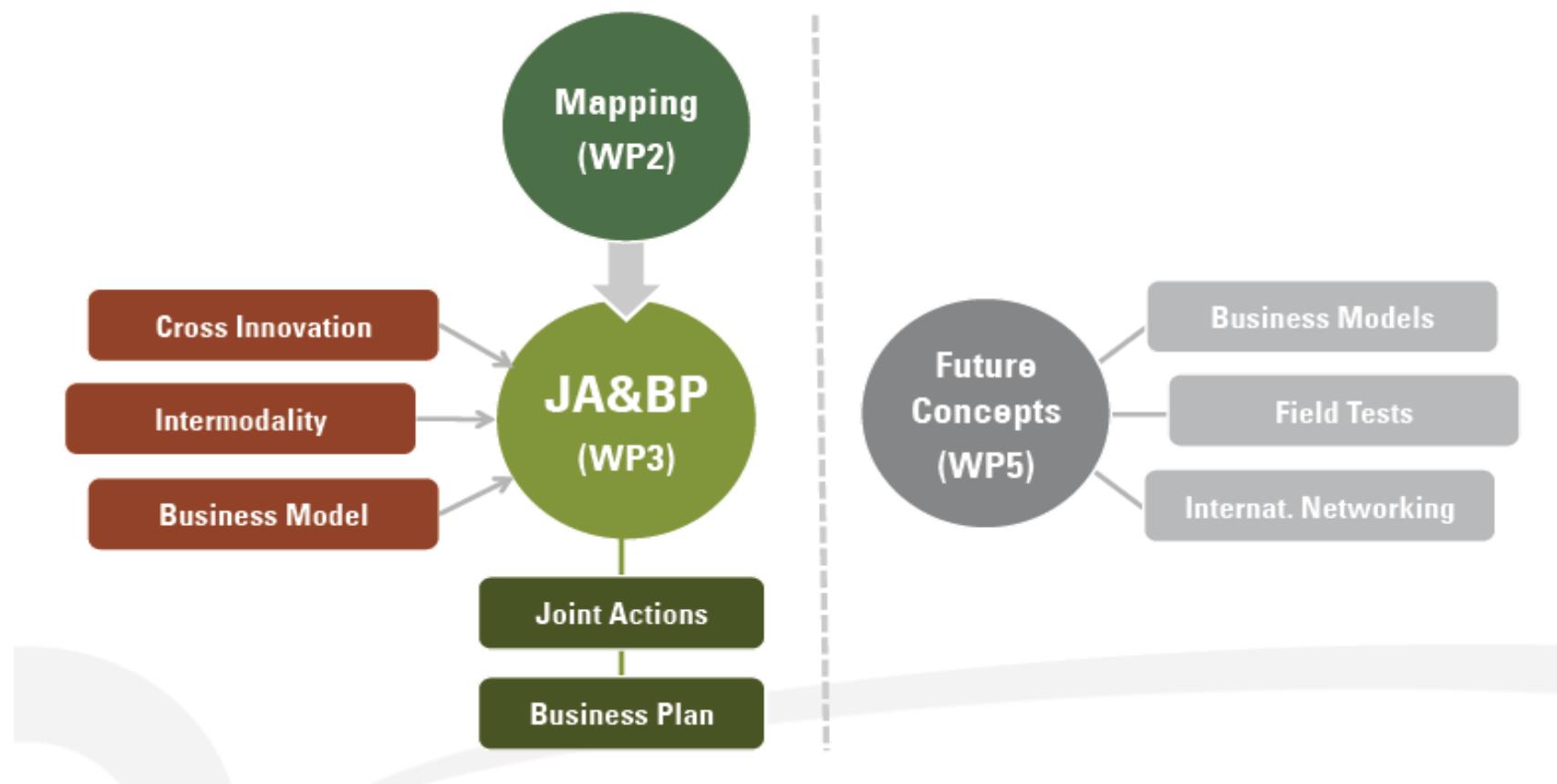


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## Regional Impact



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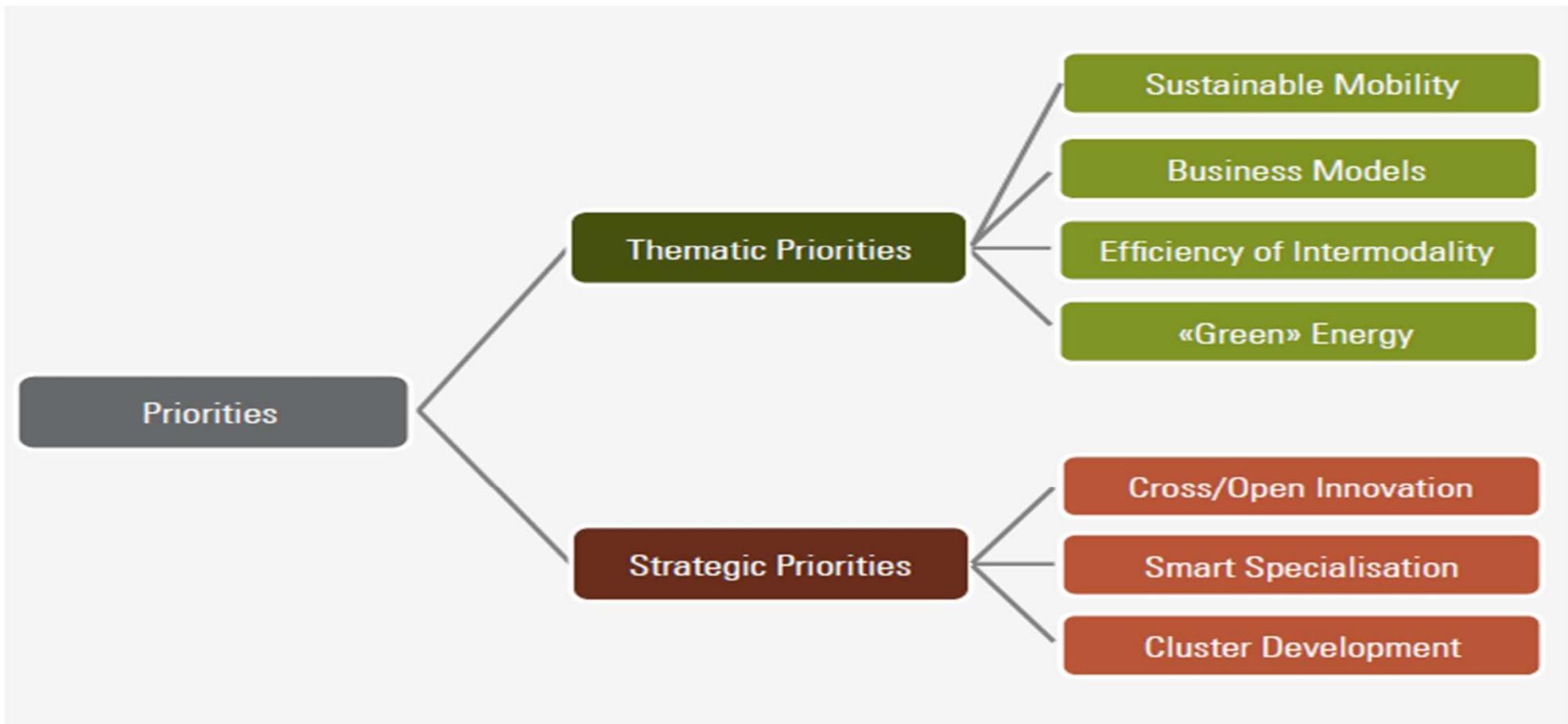
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# E-Mobility Related Challenges and Deduced Priorities



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# Joint Actions

- Help local authorities to prepare local electromobility strategies and action plans
- Test seamless and interoperable e-charging and billing systems
- Implement an “e-commuters without borders” scenario
- Prepare joint research projects on wireless charging systems for electric vehicles
- Implement a “photovoltaic-sharing” model for electric vehicles
- Create awareness-rising campaigns towards public / private large fleet owners and the general public
- Establish one-stop-shops for electromobility
- Create a practical Total Cost of Ownership calculation tool for the general public
- Develop cross-border models for mobility by defining and expanding new interchanges such as tourism

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## Contacts

### Alex David

mundi consulting ag, Bern, Switzerland

Consultant

Phone: +41 31 326 76 76

[Alexandra.Mundi@mundiconsulting.ch](mailto:Alexandra.Mundi@mundiconsulting.ch)

Researcher

Phone: +49 209 17 07 171

[david@iat.eu](mailto:david@iat.eu)

Institute for Work and Technology,  
Gelsenkirchen, Germany

### Dr. Rolf Reiner

Stuttgart Region Economic Economic  
Development Cooperation / CARS

Cluster Manager

Phone: +49 711 228 35 824

[rolf.reiner@region-stuttgart.de](mailto:rolf.reiner@region-stuttgart.de)

<http://www.future-mobility.eu>

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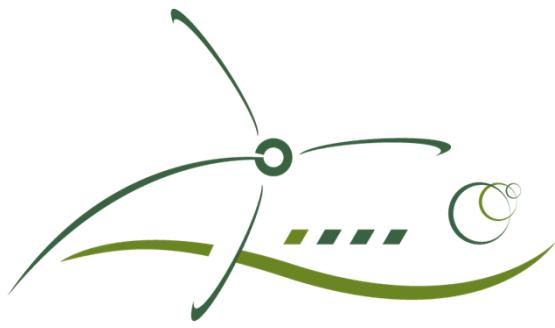
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# PLATFORM SOLUTIONS: MOBILITY SERVICES

Dr. Rolf Reiner / Stuttgart Region Economic Development Corporation



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- Requirements for an integrated mobility services platform
  - One face to the customer
  - Unified billing solutions
  - Intermodal approach
  - Multi modal routing services
  - Added value services



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# Example: Stuttgart Services



Eine Initiative der Bundesregierung



Unterstützt durch das Land Baden-Württemberg

## Facts & Figures:

- >100 partners in 40 projects with a total volume of more than € 110 million
- 2015: > 2,000 EVs and 1,000 charging points
- development of sustainable mobility systems and viable business models



**The platform project in the  
LivingLab BW<sup>e</sup> mobil**

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# Stuttgart Service Card

- One card / app for
  - E-ticketing for public transport
  - Carsharing
  - Parking
  - Charging
  - Bike and pedelec rental
  - Metropolitan services
  - ....



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- B2C service will start with 70 system-use-cases
  - Information
  - Reservation
  - Booking
  - Routing
  - Electronic ticketing
  - ...





## Technical approach

- System architecture based on business and system-use-cases
  - Hybrid architecture
  - B2B platform
  - Mobility platform (B2C)
  - Routingserver (B2C)



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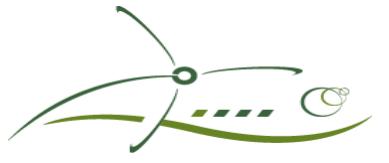


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## Field test early 2014 / Roll-out in 2015



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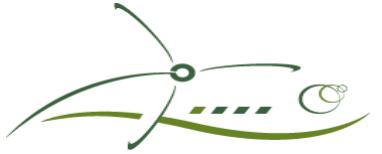


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# Opportunities

- Cross border extension through Horizon 2020
- Integration of further services
- Reach-out: > 600,000 potential customers
- Your feedback is welcome!



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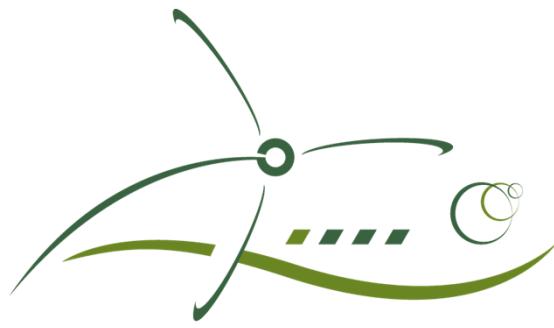
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# CROSS-BORDER ELECTROMOBILITY: THE RHEIN MOBIL CASE STUDY

Léonard Gay / Pôle Véhicule du Futur Alsace Franche-Comté



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# Cross-Border Electromobility

- A Few Facts About Cross-Border Commuting in Europe
  - **About 800,000 cross-border commuters** (2007)
  - A growing trend in many places
  - Main countries of frontier workers' origin : France, Germany and Belgium
  - **Massive individual motorised traffic** despite all the efforts made by local authorities to develop local public transport solutions
  - Related issues : congestion at rush hours, noise, air pollution, road safety



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# Cross-Border Electromobility

- Is Electromobility Suitable for Cross-Border Trips ?

- Daily occurrence
- Work-related journeys (but not only)
- Rather long distance travelled
- Ride-sharing (car-pooling) already a habit  
many groups of workers
- Awareness of transport-related issues  
of employers
- Specificities to be addressed with  
cross-border commuting: billing systems,  
standards, etc.



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# Cross-Border Electromobility

- The Rhein Mobil Project As a Case Study



- French-German initiative fostered in 2012 by 4 automotive clusters and co-funded by the DEUFRAKO programme
- **Electric mobility research pilots with an economic perspective**
- Target group: cross-border workers (about 30,000 French frontier workers living in Alsace region are in employment in Germany)
- **Challenge: are electric vehicles (EV) more economical than conventional vehicles?**

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# Cross-Border Electromobility

- Rhein Mobil Project Partners



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- Rhein Mobil Project Overview

- Maximising the annual mileage of the EVs in the urban space in France and in Germany
- Optimised fleet management according to driving profiles, including smart charging
- Research on customer behaviour
- Including technical functions as well as and social aspects
- German pilots: electric 7-passenger vans electric cars (first results available)
- French pilots: electric cars (on-going: results yet)



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# Cross-Border Electromobility

- German Pilot Facts (1/2)

Technical Data	E-Wolf Delta 2 @ Michelin	Nissan Leaf @ Siemens
<b>Range</b>	154 km	175 km
<b>Top speed</b>	110 km/h	145 km/h
<b>Speed-up 0-100 km/h</b>	12,5 s	11,9 s
<b>Average distance</b>	Michelin Karlsruhe → Elsass 60-80 km per tour	Karlsruhe → Haguenau 70 km per tour
<b>Commuters per car</b>	7	Max. 4



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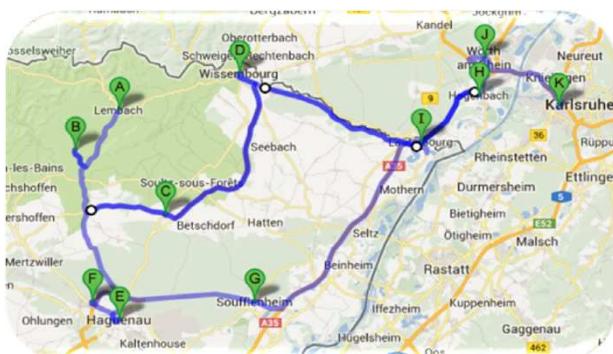


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- German Pilot Facts (2/2)

Mileage	35.400 km
Cars on the road	4 (up to 9 in the project)
Number of charging processes (conventional)	442
Number of charging processes (fast)	80
Average consumption	0,2 kWh/km
Rekuperated energy	Ca. 15 %



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# Cross-Border Electromobility

- Rhein Mobil First Results (German Pilots)
  - On 35,400 km up to now 3.3t CO<sub>2</sub> saved
  - **High purchase costs above all are the reason for buying resistance**
  - **State support is still necessary on account of high purchase costs**
  - Only with “sinking” vehicle prices (mass production) will EVs become more favorable than conventional vehicles
  - **Cross-border commuting within the range is well-suited to EVs**
  - **The restricted range is not limiting if EVs match the right mobility requirements**
  - **High vehicle occupancy requires fast charging**, which leads to specific infrastructure investments
  - Simple accounting systems required for “tanking” the EVs with electricity

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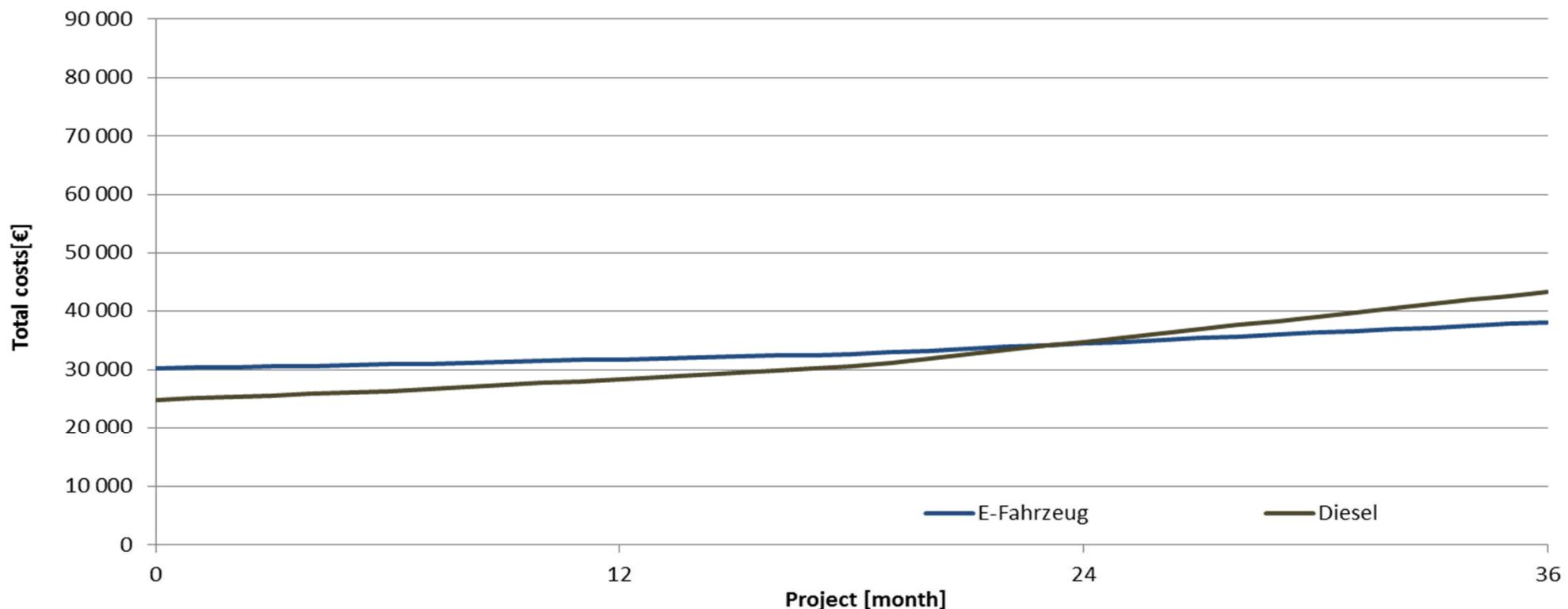


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# Cross-Border Electromobility

## Electric vs. Diesel Vehicle Total Costs



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- Rhein Mobil Project Outlook

- Until the end of 2013 a total of six vehicles are to be on the road
- Installation of fast charging stations end of 2013 / beginning of 2014
- Intensified training for drivers to increase recuperation
- Intelligent fleet management, i.e.
  - carpools use one vehicle
  - high annual
  - reduce costs

several  
to achieve a



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# Cross-Border Electromobility

- One Step Further
  - Relevance to **roll out ambitious electric mobility schemes based on successful pilots** like Rhein Mobil, CROME, etc.
  - **Potential European regions concerned by massive cross-border commuting**, such as neighbour areas of Switzerland, Luxembourg, Germany, The Netherlands and Austria, plus other spots in the proximity of Finland, the Republic of Ireland, Portugal, Liechtenstein, Andorra, etc.
- Opportunities
  - Joint Actions in the framework of the ELMOs project
  - Horizon 2020 programme to be launched very soon
  - Your feedback and know-how welcome !

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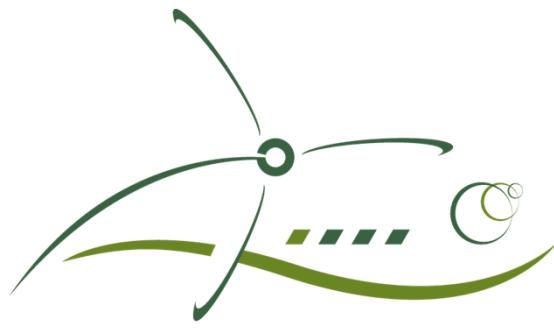
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# eROAMING/BILLING AND CROSS-BORDER PROJECTS

Dr. Reha Tözün/ Stuttgart Region Economic Development Corporation



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## eRoaming and Billing in the Stuttgart Region

- General problem: Charging stations are often operated by proprietary networks, which very often require drivers to have a membership beforehand.
- In practice: One driver, one vehicle, many membership cards.
- Roaming to allow drivers to get access to the networks of other providers is required.
- Ultimately, electric car drivers should have the same freedom that the “normal” drivers get to have at the filling pumps.

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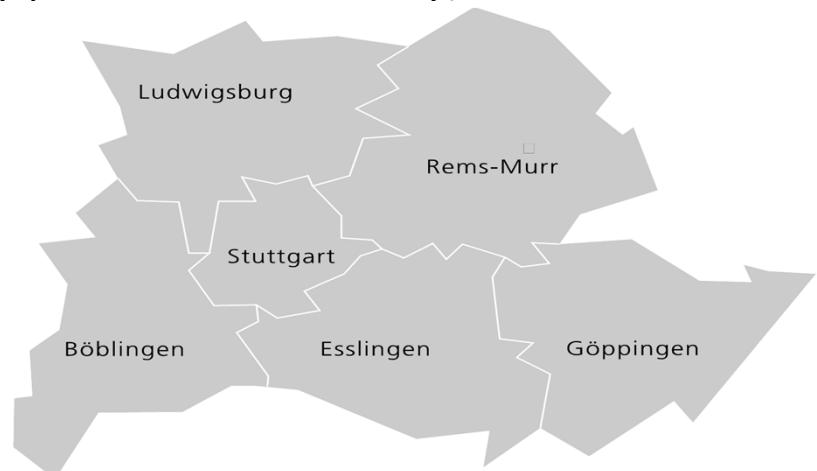
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# In and round the Stuttgart Region

- Infrastructure providers: EnBW (one of the four biggest utility providers in Germany, has the largest charging points network in the region and Baden-Wurttemberg, mainly in the city of Stuttgart) and numerous small and local providers, with up to three charging stations each.
- Two potential roaming providers:
  - Bosch SI, technology supplier to Hubject (EnBW a co-founder) and
  - ladenetz.de (a joint initiative of the smaller utility providers in Germany)
- Especially the “occasional” commuters have difficulty in accessing the infrastructure and face additional charges.



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# Steps to a solution

- Three dedicated workshops and a broad discussion with all relevant stakeholders (e.g. utility providers, OEMs and suppliers, technology providers, local politics and planners, parking providers)
- A first solution in the form of a cooperation between two towns/districts Schwaebisch Gmuend and Goeppingen, which have their own local und publicly owned utility providers.
- Two separate and mutually independent projects, where diverse stakeholders in the process are involved, are used as vehicles to implement the first pilot solution (EMiS and iZEUS).
- Apart from minor issues, eroaming between the two locations and the EnBW charging network (meaning the city of Stuttgart) is now live.

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## Next steps:

- In terms of the Stuttgart Region and Baden-Wurttemberg: to expand on the existing solution with further cities and to create eroaming corridors.
- In terms of ELMOs project, two project ideas are being developed:
  - Seamless and interoperable e-charging and billing (tentative title)
  - e-Commuters without borders (tentative title)

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## JAP / 2.1: Seamless and interoperable e-charging and billing

- Key topic: Set up a transnational, interoperable booking and billing system for electric vehicle charging
- Objective: Initiate and implement a platform to accelerate the large scale pilot deployment of a Europe-wide interoperable booking and billing system for electric vehicle charging infrastructure, thus increasing the penetration of e-vehicles and reducing pollution.
- Lead Partner: CARS/Stuttgart Region
  - ELMOs Participants: Pôle Véhicule du Futur, Vorarlberg, Switzerland...)
  - Other Participants: European regions and cities with an existing e-activities.
- Fast-charging is a point of interest.

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## JAP / 2.1: Seamless and interoperable e-charging and billing

- eRoaming consortia/networks/infrastructure already in place in Germany, France, Switzerland, Belgium and Holland. There is need to assist the cross-links between them and help the expansion of DC-charging
- The project can and should build on these networks and the outputs of currently on-going projects, like Green eMotion, CROME (CROss-border Mobility for Evs), iZeus and Rheinmobil, to name a few.
- Task: Creating a pan-European network that stimulates an efficient cooperation platform for private enterprises, local authorities and national as well European institutions.



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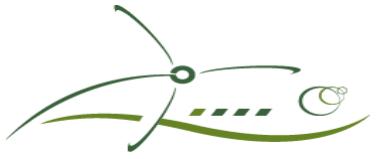
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## JAP / 2.2: e-Commuters without borders

- Key topic: Set up a cross-border, consumer-oriented electromobility service
- Objective: Identify the existing cross-border commuter streams and stimulate the development of cross-border sustainable mobility services based on intermodality and carsharing in a 3- year project.
  
- Lead Partner: CARS/Stuttgart Region
- ELMOs Participants: Pôle Véhicule du Futur, Vorarlberg, Switzerland and potentially Friedrichshafen (based on BodenseEmobil)
- Other Participants: Border regions and cities in Europe with a high-level of regular cross-border traffic. Here key local partners are the regional development agencies, regional tourism marketing offices and local transport services providers, among others.

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[www.future-mobility.eu](http://www.future-mobility.eu)

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