

## **E-Mobility NSR –**

1st International Workshop on "Experiences and the future of EV Fast Charging", Hamburg March 15, 2012

# **Accelerated Introduction of Electric Vehicles in North West Europe**

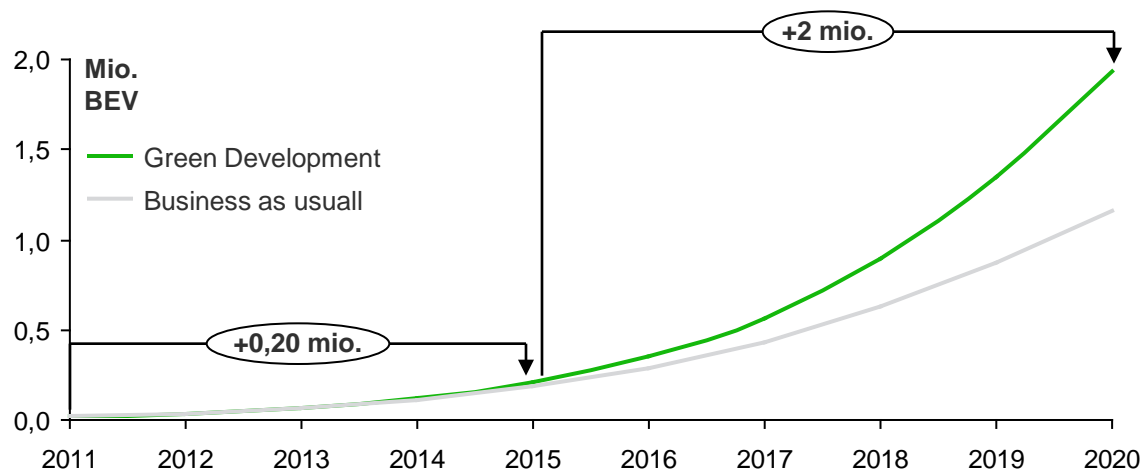
ENEVATE: Project Lay-Out and First Results

Dr. Kord Pannkoke, Christian Ernst

**Accelerating E-Mobility**

- ENEVATE, why and how did it start.
- Project Layout
- First Results
  - Electric vehicle supply chain development (WP1)
  - Sustainable energy supply infrastructure (WP2)
  - Market drivers and mobility concepts (WP3)
  - Pilots (WP4)
  - Enabling / Innovation Accelerator (WP5)

## EU BEV Market development



A **vehicle fleet of 270 million** in total in Europe is expected in 2020 (2009: 225 million).

The **new vehicle registrations** in the **European Market** stagnates. BEV hold a share of 2-5% in 2020.

The **stock of BEVs** grows to about **1.2 to 1.9 million**.

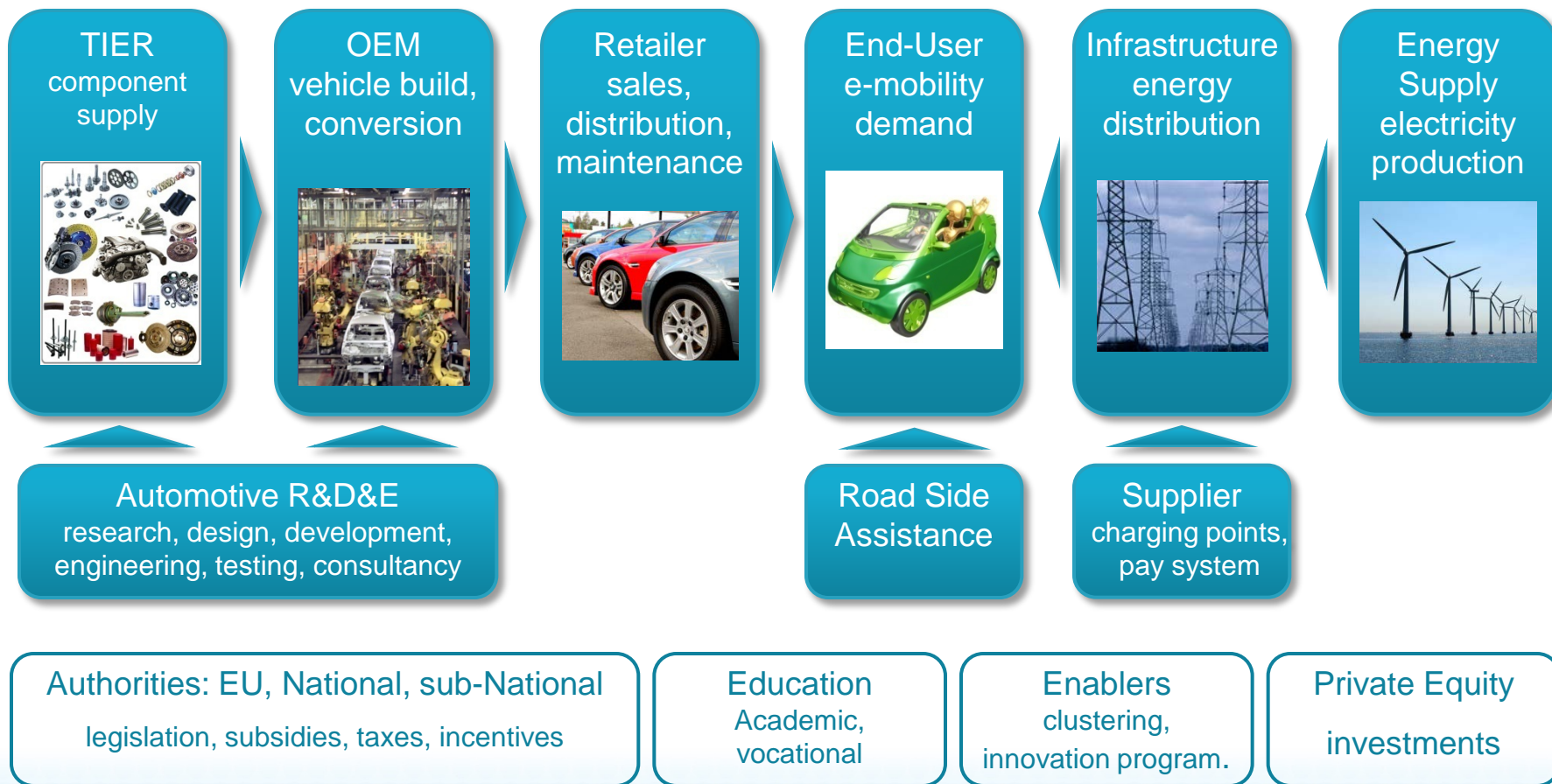
**Starting around 2015** we expect the market development to rise higher than average.

**New vehicles and their components** have to be developed and production lines have to build up to that point.

**The ‘electrification of the vehicle’ has begun.**

**The pure battery electric vehicle is one out of many options...**

**Accelerating E-Mobility**



## Accelerating E-Mobility

# Why NW-European project on E-Mobility

- Most regions spend large public funds on EV & E-Mobility programs, pilots & stimulation → with no learning effects over the regional borders
- Europe is scattered in strategy, programs and implementation.
  - The competition comes from China, Japan and even US
  - With a much more coherent approach
- Integral approach is absent.  
On national, regional and city level



# Why NW-European project on E-Mobility

- **User acceptance is the question mark.**  
Should be driver for mobility concepts and industry development.
- The many promising **SME companies** working on EV, are not to be found by VM.
- **Electric energy / infrastructure & automotive** are historically isolated from each other.



**Accelerating E-Mobility**

## ENEVATE aims to

facilitate and support an accelerated and well informed introduction of electric mobility in North West Europe through structured trans-national co-operation between public authorities and business representatives.



## Netherlands

1 Automotive Netherlands

## Belgium

2 Campus Automobile de Francorchamps  
3 Flemish Institute for Technical Research (VITO)

## Germany

4 Regionalmanagement Nordhessen  
5 Bayern Innovativ  
6 Inno Germany  
7 Forschungszentrum Jülich

## United Kingdom

8 Coventry & Warwickshire Chamber of Commerce  
9 European Automotive Strategy Network (EASN)  
10 National Renewable Energy Centre(Narec)  
11 Future Transport Systems (FTS)  
12 Cardiff University

## Ireland

13 Electricity Supply Board (ESB)

## France

14 Pôle Véhicule du Futur  
15 Institut de Recherche en Systèmes Électroniques Embarqués (IRSEEM)







## Electric Vehicle Supply Chain Development

Lead: North Rein-Westphalia, Germany



## Sustainable Energy supply infrastructure

Lead: Future Transport Systems, UK



## Market drivers and mobility concepts

Lead: Cardiff University, UK



## Pilots

Lead: Automotive Netherlands



## Enabling / Innovation Accelerator

Lead: Bayern Innovativ, Regionalmanagement Nordhessen, Germany



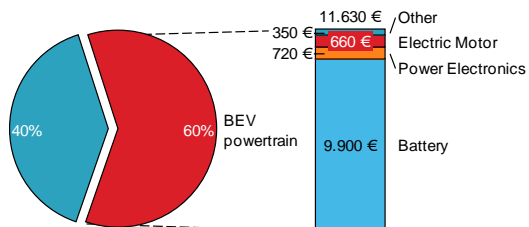


## Electric Vehicle Supply Chain Development

Lead: North Rein-Westphalia, Germany

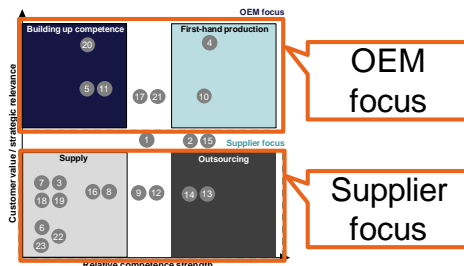
The aim of WP 1 is to **analyze the conventional supply chain** and to **define the future supply chain for battery electric vehicles** based on the OEM to supplier network in Europe.

### Value added



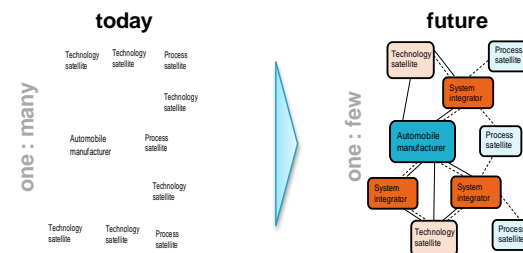
- A BEV comes along with ~63% more value added. It is especially generated at the suppliers dealing with battery cell prod..
- Around 75 % of the ICE drive train production value is falling away.
- The current product portfolio of suppliers may be endangered.

### Make or buy analysis



- OEM's: engine mngt, Integration of batteries & electric systems, software, thermal & battery mngt.
- Suppliers: take over development & manufacturing of key components of electric drive train: transmission, battery modules & cells, climate systems, engine & power electronics, high voltage wiring etc.)

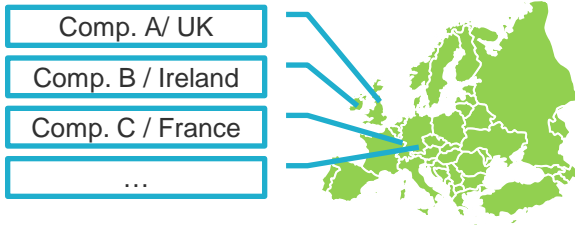
### Production structure



- Production structures will develop and restructure.
- System integrators will become a major role in future (offering the full electric drivetrain as integrated solutions).
- SMEs will have to orientate towards them.

# Competencies all over Europe need to be found and connected to develop a strong EV supply chain

## North West Europe NWE



In whole North West Europe more than 900 companies are active in the automotive industry, but distributed over many locations.

## Systematic Determination

Kompetenz	Komponenten							
	Gesamtfahrzeuge	Exterieur	Karosserie	Chassis	Motor & Antriebssatz	Elektrik & Elektronik	Interieur	
Forschung & Entwicklung		X						
Testen und Validierung	X	X				XX		
Kleinserienfertigung	X					X		
Großserienfertigung						X		
Vertrieb & Marketing								
Service & Reparatur								
Recycling								

The competencies of all identified companies have been systematically determined for each field (electric motor, suspension ...)

## Database Analysis

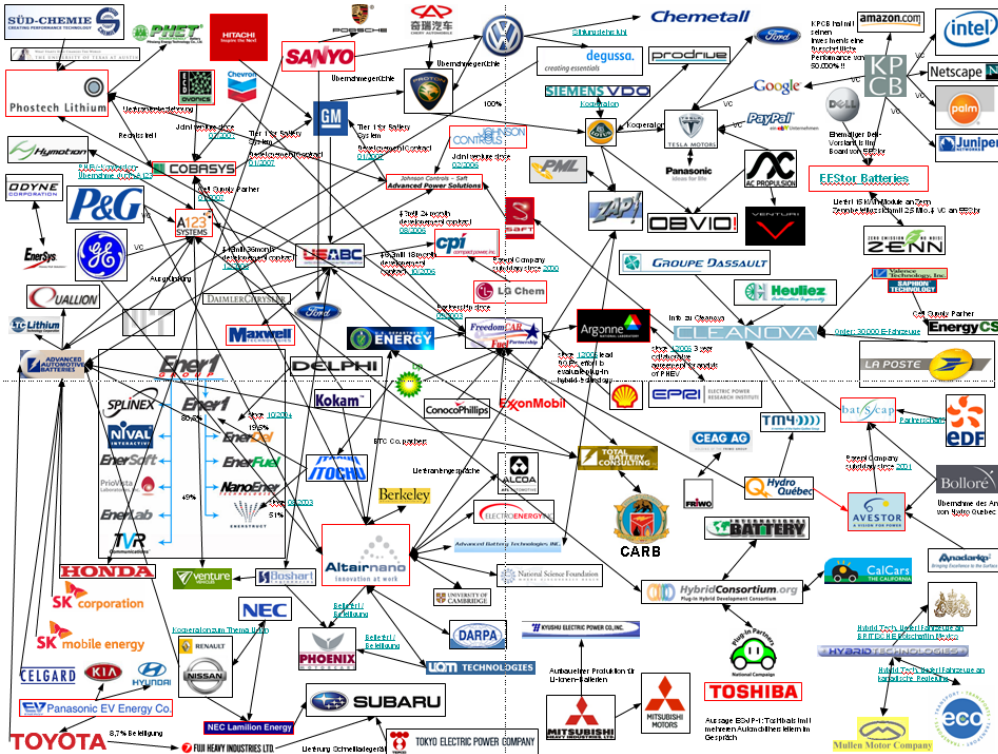


The EV supply chain database allows a 'white spot analysis' for competencies in each region

Each separate region doesn't cover all competencies required to build a BEV. **The white spot analysis shows the lack of competencies and capacities in the regions.**

	North West Europe (>900)	
Research and Development	●	Fully covered
Testing and validation	●	Fully covered
Manufacturing (Low / High volume)	◐	Nearly all important BEV components are available within NWE
Reuse & Recycling	◑	Recycling for classic components is available but still a white spot for electric components

- All technologies are present in NW Europe.
  - Advanced level
  - Mainly at R&D status and not yet application / commercial
  - Recycling is still lacking (but is in development)
- Present EV technology suppliers (small niche players) are not connected to OEM's and their suppliers, are not to be found (by VM and others).



## Implications on the automotive industry??

# Strategies of current and new actors in the automotive industry need to be adapted to the next challenges ...

## Challenges for OEM and suppliers



- **Intense competition** (more than 900 competitors in NWE)
- **Lack of knowledge transfer from R&D to production**
- **High investment demand** referring to electric mobility
- High economic risk by insecure development of electric mobility
- Classic **business models** for OEM have to be modified respectively developed from scratch

## Short-term strategy in reference to challenges



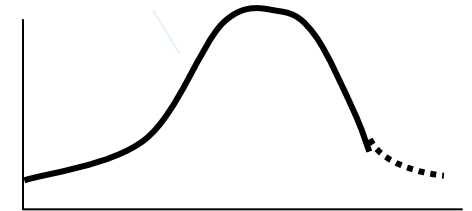
- Strengthen **the companies visibility** and competence profile to fit the EV s.c.
- Where own competencies are not sufficient, collaborations are established to face the new challenges as strategic alliances
- Possible collaboration types:
  - OEM A – OEM B
  - OEM – Tier X
  - Tier 1 – Tier 2
  - **Industry – university**
  - ...

## Mid- to long-term strategy

Consolidation of key component suppliers



Number of collaborations/suppliers of key components



An early strategic orientation of corporate activities is highly important to achieve a well-established market position.

**New and innovative business models** are expected with the integration of BEV in the automotive market. Especially, if **fleet operators** become increasingly successful, the rules in the industry may change dramatically:

- The strengthened end-customer shifts towards “**Pay for Use**” rather than “**Pay to Own**”
- New (**aviation industry type**) **business models** may come up: OEMs build cars to Fleet Operators.
- Fleet operators will push the **standardisation** of vehicle interfaces.
- Fleet operators may dictate the **battery market**. Hence, the battery technology by itself may be of less importance.



## There are strategic chances to...

- **... capture sustainable fields of added value in the automotive industry, i.e.:**

- Positioning as a system integrator or technology specialist
- Adoption of significant decision and manufacturing areas
- Occupation of new downstream business possibilities for OEM



**Field of action**  
Added value strategy

- **... benefit from synergy effects and know-how advantages by linking with excellent players and regions, i.e.:**

- Exploit economies of scale with modular products (e.g. e-motors)
- Make use and expand long-time competencies in electric engineering with automotive know-how
- Build up cooperation with experts in the nearby region along the value chain up to the transfer of know-how



**Field of action**  
Regional added value /  
production network

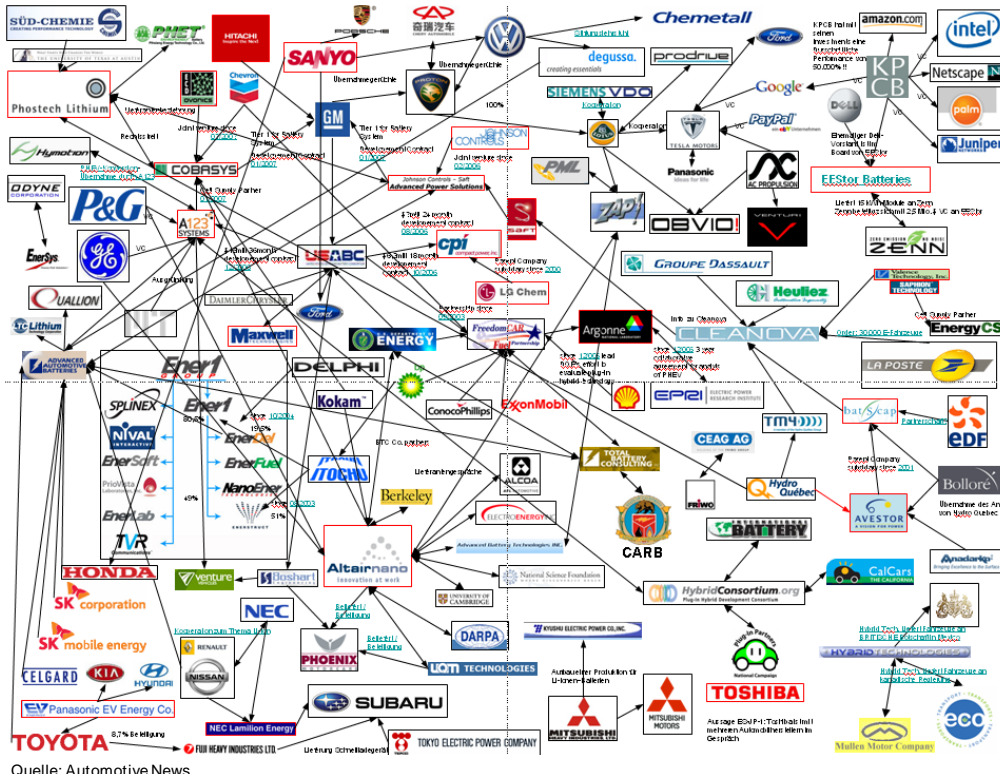
- **... step ahead by introducing leading innovations. Therefore the international link between researchers needs to be tightened, i.e. in the following fields:**

- Electric motor: electric reluctance motor
- Energy storage: metal-air-batteries
- Integrated modules, e.g. a combination of power motors



**Field of action**  
Innovation

# Opportunities for the automotive industry



- New technologies
- New markets
- Global partner networks
- Opportunities for new suppliers

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## Sustainable Energy supply infrastructure

Lead: Future Transport Systems, UK

Development of a practical Tool Kit to assist project managers is developing sustainable recharging infrastructure for E-mobility.

Bringing together lessons learned from partners in the UK, Ireland, Belgium, Germany, France and the Netherlands the Tool Kit is designed to help accelerate the development of EV charging infrastructure.

Whilst describing approaches to policy development and technology deployment it primarily focuses on the process that needs to be followed in developing charging infrastructure so that time and cost can be minimised.



## Market drivers and mobility concepts

Lead: Cardiff University, UK

The intermediate objectives of this study are to identify:

- impacts of the introduction of EVs on user and market behaviour
- potential for new e-mobility concepts.
- market drivers that will influence the acceptance of the different EV mobility concepts and the conditions needed for realising this acceptance.

The definition of integrated sustainable e-mobility concepts and scenario building for future concepts are also being undertaken.

The aim is to explain the impacts of the introduction of electric vehicles on user and market behavior. Interviews of regional stakeholders will allow to find out how public policies can influence user acceptance by information, taxation and regulations.

As a result, we may be able to identify regional differences and similarities,

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## WP 4: Pilots

Lead: Automotive Netherlands

**Major objective:** mapping of existing EV pilots in NEW,  
visiting, knowledge exchange



## WP 5: Enabling / Innovation Accelerator

WP lead: Bayern Innovativ, Regionalmanagement Nordhessen, Germany

### Aims and objectives:

- Stimulating technology partnerships and establishing transnational co-operations.
- Communication and documentation of project content

## First results:

- Already a total of 81 pilots mapped in the ENEVATE region ([online database](#))
- [Study trips](#) to various pilots in the NWE region that are open to all interested stakeholders and different sectors to learn and benefit from them.
- [Pilot visits](#) to: North East England, Montbéliard ; NRW; Noord-Brabant; Ireland and Bavaria.

## Deliverables:

- [Guidelines](#) for pilot “owners” how to design and implement their EV pilot in an effective way.

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The screenshot shows the ENEVATE website interface. At the top, there is a navigation bar with links for 'ABOUT', 'NEWS & ARTICLES', 'EVENTS', 'ACTIVITIES', and 'DATABASE'. Below the navigation bar, there is a header section with the ENEVATE logo and the tagline 'Accelerating E-Mobility'. A yellow car is featured in the header. The main content area includes a map of Europe with several red dots indicating pilot locations. A red arrow points to a specific location in North East England, which is highlighted with a green box labeled 'SWITCHEV'. To the right of this box, the text reads 'Pilot name: SWITCHEV'. The website also features a search bar and a sidebar with various filters and search options.



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## Accelerating E-Mobility

ENEVATE aims to facilitate and support the accelerated introduction of electric mobility in NW Europe through structured transnational cooperation between public authorities and business representatives.

### TOP NEWS

#### Enevate Database available on 31. May 2011

The database will be used to bring companies together, to share knowledge on EV pilots and to start new projects.

[read on >](#)

#### Leoni delivers high-voltage electrical system for mia - mass production of electric Microbus

Source: LEONI AG, "Leoni startet Elektroauto mia mit HV-Bordnetz aus", 17 March 2011

[read on >](#)

### TOP EVENTS

17. May 2011

#### Enevate Launch Event

[read on >](#)

### ACTIVITIES



Electric Vehicle Technology >



Sustainable Energy Supply Infrastructure >



Market Drivers and E-Mobility Concepts >



Pilots >



Enabling / Innovation Accelerator >



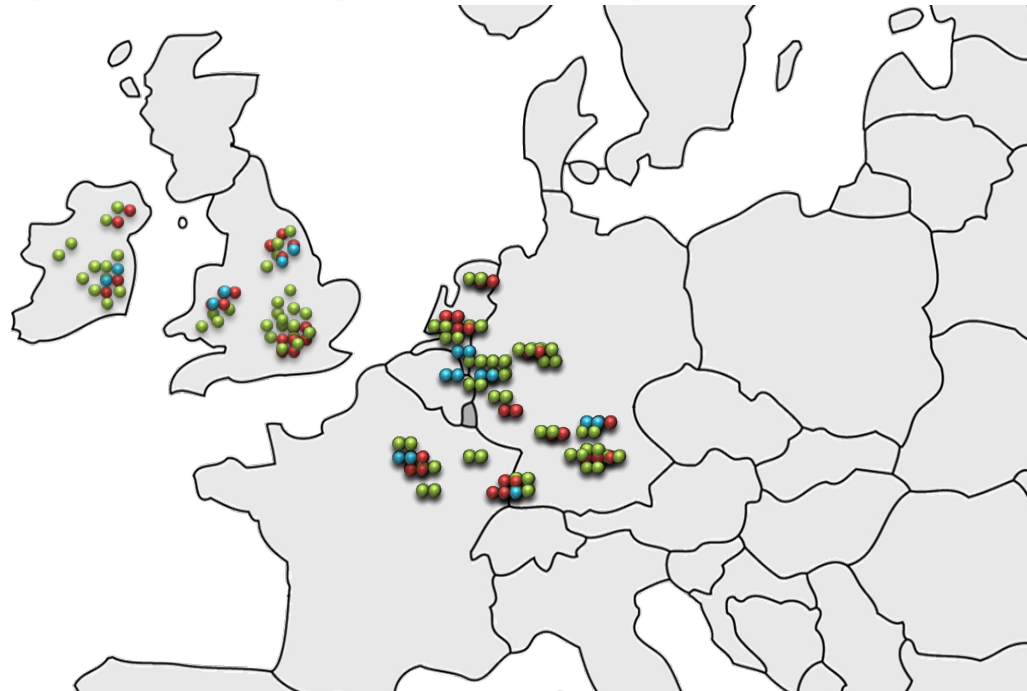
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## Accelerating E-Mobility

ENEVATE aims to facilitate and support the accelerated introduction of electric mobility in NW Europe through structured transnational cooperation between public authorities and business representatives.

● ENEVATE partners ● EV Stakeholders ● EV Pilots



**Databases**

- + Companies
- + Test-Facilities
- + Education

**Filter by letter**

- + Reset # A B C D E F G H I J K L
- + M N O P Q R S T U V W Z

**Search**

Company quickfinder:

- + VDA-Key search
- + Advanced search

**More**

- + Login Database
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- + automotive-industry.eu

- >> [Go to all ENEVATE partners](#)
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- >> [Go to all EV pilots](#)



# **ENEVATE**



European Network of Electric Vehicles and Transferring Expertise

**[www.enevate.eu](http://www.enevate.eu)**