Accelerated Introduction of Electric Vehicles in North-West Europe

ENEVATE: Project Lay-Out and Results

Dr. Kord Pannkoke
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ENEVATE – Accelerating E-Mobility

European Network of Electric Vehicles and Transferring Expertise

- Introduction of ENEVATE
- Electric Vehicle Supply Chain Management  
  dr. Kord Pannkoke - Bayern Innovativ
- Sustainable Energy Supply Infrastructure  
  Matthew Lumsden - FTS
- Market Drivers & Mobility Concepts  
  Huw Davies - Cardiff University
- Pilot experiences
- SWOT & Policy Recommendations  
  Edwin Bestebreurtje - FIER Automotive
- What’s next: ENEVATE 2.0  
  Harm Weken - EASN
Why a NW-European Networking 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
- 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 the Vehicle Manufacturers
- Electric energy / infrastructure & automotive are historically isolated from each other
ENEVATE aims to facilitate and support an accelerated and well-informed introduction of electric mobility in North-West Europe through structured transnational co-operation between public authorities and business representatives.

And at same time to boost innovation and competitiveness of the rapidly developing electric vehicle sector in NW Europe.
Work Packages

- **Electric Vehicle Supply Chain Development**
  Lead: AutoCluster.NRW, GER

- **Sustainable Energy supply infrastructure**
  Lead: Future Transport Systems, UK

- **Market drivers and mobility concepts**
  Lead: Cardiff University, UK

- **Pilots**
  Lead: Automotive NL

- **Enabling / Innovation Accelerator**
  Lead: Bayern Innovativ, Regionalmanagement Nordhessen, GER
Work Packages and Results
Electric Vehicle Supply Chain Development

Lead: AutoCluster.NRW, Germany
Methodological approach with following steps

| WP1.1 | Analysis of the conventional supply chain |
| WP1.2 | Technical analysis of electric vehicles |
| WP1.3 | Conception of a supply chain for electric vehicles |
| WP1.4 | Comparison of ICE and BEV supply chain |
| WP1.5 | Validation of findings |
| WP1.6 | Database generation and analysis of the European BEV competencies map |
| WP1.7 | International benchmark to leading regions |

Analysis report

**Online portal** for the EV industry and related sectors

**Training sets** for target audiences on EV technology and supply chain

**Information packages** for target audiences on EV technology and supply chain
The valued added distribution will change significantly and makes a change in the minds of OEMs and suppliers mandatory:

- A BEV comes along with ~63% more value added. Especially suppliers of battery cells and systems profit.
- Around 75% of the ICE drivetrain production value is falling away.
- The product portfolio of suppliers may be endangered and makes a deeper analysis of the future compliance with the electrified drive trains necessary.

A make or buy analysis for all BEV components gives an insight on the future task sharing – but multiple strategies will be seen in the next years:

- OEMs will most likely focus on brand shaping and strategic relevant components.
- Attractive chances for suppliers are shown in interchangeable components and systems.

Often, xEV & ICE vehicles will be produced on the same flexible production lines:

- Therefore the same process structure will be applied, but experience in the supply relations needs to be build up especially within the electronics industry.
- Sophisticated know-how in production technology is therefore a strategic asset for OEMs.
There are competencies all over Europe as basis for a strong EV supply chain.

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

Source: Database - www.enevate.eu
There are competencies all over Europe as basis for a strong EV supply chain.

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

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

The EV supply chain database allows a ‘white spot analysis’ for competencies in each region.
There are competencies all over Europe as basis for 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**

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

**Evaluation**

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.**

<table>
<thead>
<tr>
<th>Field</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research and Development</td>
<td>Fully covered</td>
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<tr>
<td>Testing and validation</td>
<td>Fully covered</td>
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<tr>
<td>Manufacturing (Low / High volume)</td>
<td>Nearly all important BEV components are available within NWE</td>
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<tr>
<td>Reuse &amp; Recycling</td>
<td>Recycling for electric components is a white spot</td>
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</table>
Exemplary recommendations for action:

- **Policy Makers**
  - Improve networking of industry across all sectors
  - Support of know-how transfer from research and development to market ready products

- **Vehicle Manufacturers**
  - Develop the fitting vehicle for the current and future customer requirements:
    - BEV are especially suitable for vehicle fleets driven in inner cities. This includes light commercial vehicles.
    - PHEV are the fitting technology solutions for customers with an additional demand for long distance drives.

- **Vehicle Suppliers**
  - Orientation towards the right strategic business partner, since the supply chain structure will change over the next years with increasing volumes.

All actors need to set the right course to establish a strong electric mobility value chain.
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Future Transport Systems

Connecting systems
- EV charging
- Vehicle 2 Grid (mobile storage)
- Energy storage (static storage)
- Energy management system integration
- Grid support – micro & macro
- Intelligent, integrated mobility management

Business models
- Managed charging
- Demand response
- Electricity trading
- Time of Use tariffs
- Local network management
- Multi-stakeholder value streams
- Fleet management – facilities management
- Car clubs
- Multi-modal mobility

Behavioural influence
- Vehicle purchasers
- Drivers and fleet managers
- Inhabitants of the built environment
- Facilities managers
- The role of infrastructure
- The role of experience
- Interaction, knowledge, communication
## Typical projects

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Regional strategies</th>
<th>SWITCH EV (TSB)</th>
<th>ENEVATE (EU Interreg)</th>
<th>EVALU8 (OLEV – PIP)</th>
<th>Infras’t’ure partnership</th>
<th>V2G</th>
<th>Managed Charging</th>
<th>Everest (DECC)</th>
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<tbody>
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<td>2009</td>
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### Partners/clients
- Various UK regions
- Nissan, SEV, Peugeot, Newcastle Uni, AVID
- Partners in UK, NL, GR, B, IR, F
- Herts Uni
- Major Industrial Blue Chip
- 4 UK Distribution network operators
- Major global energy company
- Automotive supply chain

### Value
- £250k
- £10m
- €5m
- £7.5m
- £100k
- £2.5m
- Confidential
- £3.6m

### Objective
- Develop EV charging network & e-mobility strategies
- Flagship TSB vehicle trial 43 vehicles, 24 months
- Researching EU EV infrastructure landscape, developing tool kit
- East of England Plugged in places EV charging network
- Commercial partnership to develop and operate EV charging network
- Develop V2G conversion feasibility and trial
- Create sophisticated managed charging trial within UK, US and Germany
- Develop and trial unique energy storage concept
Why develop the ENEVATE Tool Kit?

• Many EV infrastructure and e-mobility pilot projects
• Little sharing of knowledge
• E-mobility is still in the R&D phase we need to work together
• A big knowledge differential
The development process

• Insights from parties climbing the learning curve
• Borrowed their tools
• Combined their experience
• Created a Tool Kit guidance document
• Passed it on
• Trialled on several projects
Part of a set of documents

- Technical & strategic background information
- Detailed technical guidance on charge point installation
- Key components of the development and implementation process

Bespoke workshops
Structure

Strategy & design  Planning  Implementation  Operation
# Tool Kit Structure

<table>
<thead>
<tr>
<th>Start</th>
<th>Strategy &amp; Design</th>
<th>Planning</th>
<th>Implementation</th>
<th>Operation</th>
<th>End</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start</td>
<td></td>
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<tr>
<td></td>
<td><strong>Project strategy &amp; design</strong></td>
<td><strong>Project planning</strong></td>
<td><strong>Project implementation</strong></td>
<td><strong>Infrastructure operation</strong></td>
<td><strong>End</strong></td>
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<tr>
<td></td>
<td>What are the objectives and scope?</td>
<td>How will the project be delivered?</td>
<td>Are all the key components understood?</td>
<td>How will system operation be managed?</td>
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<tr>
<td></td>
<td>How will the scheme be funded?</td>
<td>How much will the project cost?</td>
<td>Has an appropriate delivery process been developed?</td>
<td>How will the hardware be serviced and maintained?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Where should charge points be installed?</td>
<td>How will sites be recruited?</td>
<td>Have appropriate technology and service providers been sought?</td>
<td>On-going investment management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>What strategic partners will be needed?</td>
<td>What will be the technology strategy?</td>
<td>How will stakeholder involvement be maintained?</td>
<td>Infrastructure user engagement</td>
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<tr>
<td></td>
<td>What policies will need to be adhered to?</td>
<td>How will interoperability be assured?</td>
<td>How will stakeholders join the operating system?</td>
<td>Infrastructure owner engagement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>What business model will be adopted?</td>
<td>What functionality will be required of the operating system?</td>
<td>Is the critical path understood?</td>
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</tr>
<tr>
<td></td>
<td>How will the project be structured contractually?</td>
<td>High level timing plan</td>
<td>Is the capability and capacity available?</td>
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</tr>
<tr>
<td></td>
<td>Is the project future proofed?</td>
<td>What are the major risks?</td>
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</tbody>
</table>
Use of the Tool Kit

Existing EV infrastructure projects