

## Electro-Mobility Battery Standardization



**Alfons Westgeest**  
**Secretary General EUROBAT**  
Battery Day – 30 November 2010

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- **Energy Storage Applications**
- **Battery Standardization**
- **Battery Standardization for EVs**
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**The Association of European Automotive and Industrial Battery Manufacturers**

- Promotes the interests of European manufacturers and supply chain of automotive and industrial batteries
- Represents the industry on European Institutions level, as well as on national and international level
- Provides expert information to decision-makers, customer, stakeholders and media

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**Actively Engaging with Stakeholders**

**European and international battery associations**

**Customers' associations (Automotive)**

**Platforms / Forums / NGOs**

**Suppliers' associations**

**Customers' associations (Industrial)**

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### **Batteries – Main Applications in Stationary, Motive and Automotive Applications**

- Autonomous and well proved electro-chemical energy storage systems
- Enabling new technologies for future sustainable energy systems
- Commitment to viable technical solutions for combating climate change and reduce CO2 emissions in transport
- Know-how and cross-fertilization towards innovation of battery technology in transport, renewable energy and other applications such as the batteries for sustainable energy grid-integration to support the pHEV and EV infrastructure



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## Electrification Concept of the Power Train:

**Contributing to the car platform**

- Stop & Start Applications already in mass market
- Mild and full Hybrids
- Plug-in Hybrid Electric Vehicles (pHEVs)
- Electric Vehicles (EVs)

**EUROBAT contributing to the infrastructure**

- Renewable energies: photovoltaic, wind...
- Electricity grid functionalities

► BES being a sustainable way to transport RES

Plug-in-HEV: Idem as full EV but battery can be charged from the externally from the power supply network  
 Battery EV: Electric motors only. Battery recharged by a high power connection from the electricity grid  
 (Battery technology: Lead based, Li-Ion, NiNaCl2, NiMH etc.)

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## Sample Forecast 1: EU Hybrid Vehicle production 2008-2015:

Source: Industry


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### Technical Committees IEC TC21 and Cenelec TC21x

1) Responsible for all standards for all secondary cells and batteries, irrespective of type or application.

2 °To support other technical committees standardizing application oriented systems using secondary cells and batteries:

- IEC TC 9 Railways,
- IEC TC 69 (EV),
- IEC TC 82 (photovoltaic),
- IEC TC 88 (wind),
- **ISO** TC 22 (car manufacturers), labo (UTE), ...
- IEC TC 35 ships
- IEC TC 34D (emergency lighting)
- IEC TC 57 (Data communication for distributed energy)

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### **EUROBAT Evaluating the Standardization Efforts which are necessary to Boost Electro-Mobility**

- Not to limit the scope to components for plug-in HEV & EV only
  - To keep the door open for improvements of other technologies such as start-stop, mild and full hybrids
    - improved recovering energy from regenerating braking
    - not connected yet to the power grid but important
- But today already to contributing considerable to the further efficiency and electrification of road vehicles.

- **Automotive future = variety of technical solutions**
- **Different battery technologies co-exist and complement each other**

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**Most of the European Standards are of IEC Origin:**

- IEC TC21, SC21A and Eurobat experts **engaged** in the process to **update the standards** according to the need of the **HEV and HEV**
- Closer **cooperation** with other Committees, such as
  - IEC TC 69 (Electric road vehicles and electric industrial trucks)
  - ISO TC22 (Road vehicles) has been initiated specially for the project on “**Lithium standards for EV and HEV**” (IEC 62660 series). This cooperation is now very efficient and will ensure consistency within IEC, and also with ISO standards.
- **Cenelec Project EN 50342-6** to focus on Start-Stop Micro battery. Ad hoc working group is preparing a draft on new cycle procedures and tests for AGM type batteries. Call for experts end 2010 to discuss results
- Status of the battery standardization for EV and HEV is summarized in the following tables:

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**Situation of the Battery Standards Necessary for the EV/HEV Markets – part 1 (Today – 2010):**

IEC	CENELEC	Battery Element	Application types
<b>For batteries (products)</b>			
<b>IEC 61982-1</b> (2006-09) Secondary batteries for the propulsion of electric road vehicles - Part 1: Test parameters	<ul style="list-style-type: none"> <li>• <b>EN 61982-1</b> (2006)</li> <li>• [IEC 61982-1]</li> <li>• Secondary batteries for the propulsion of electric road vehicles - Part 1: Test parameters</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Pb, NiCd</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>EV</b></li> </ul>
<b>IEC 61982-2</b> (2002-08) Secondary batteries for the propulsion of electric road vehicles - Part 2: Dynamic discharge performance test and dynamic endurance test	<ul style="list-style-type: none"> <li>• <b>EN 61982-2</b> (2002)</li> <li>• [IEC 61982-2]</li> <li>• with <b>corrigendum</b> to cover editorial correction</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Pb, NiCd</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>EV</b></li> </ul>
<b>IEC 61982-3</b> (2001) Secondary batteries for the propulsion of electric road vehicles - Part 3: Performance and life testing (traffic compatible, urban use vehicles) + <b>Correction sheet (21/582/INF)</b>	<ul style="list-style-type: none"> <li>• <b>EN 61982-3</b> (2001)</li> <li>• [IEC 61982-3]</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Pb, NiCd</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>EV</b></li> </ul>

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<b>Situation of the Battery Standards Necessary for the EV/HEV Markets – Part 2 (Today – 2010):</b>			
IEC	CENELEC	Battery Element	Application types
<b>For battery installation</b>			
<b>IEC 62485-3 (2010)</b> : Safety requirements for secondary batteries and battery installations – Part 3: Traction batteries	<ul style="list-style-type: none"> <li>• <b>EN 50272-3 (2002)</b></li> <li>• Safety requirements for secondary batteries and battery installations – Part 3: Traction batteries</li> </ul>	<b>Pb, NiCd, NiMh and other alkaline secondary batteries</b>	<ul style="list-style-type: none"> <li>• <b>EV</b></li> <li>• (can be used as a Guide for HEV)</li> </ul>
•ISO	•CEN	•Battery Element	•Application types
<b>For battery system in cars</b>			
<b>ISO 6469-1 (2009)</b> Electrically propelled road vehicles -- Safety specifications -- Part 1: On-board rechargeable energy storage system (RESS)			<ul style="list-style-type: none"> <li>•<b>EV, HEV</b></li> </ul>

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<b>Situation of Battery Standards for the EV/HEV markets (Tomorrow – 2012):</b>			
IEC	CENELEC	Battery Element	Application types
<b>• For batteries (products)</b>			
<ul style="list-style-type: none"> <li>• <b>IEC 61982 (2012)</b> Secondary batteries (except lithium) for the propulsion of electric road vehicles - Performance and endurance tests</li> </ul>	<ul style="list-style-type: none"> <li>• <b>EN 61982 (2012)</b> Secondary batteries (except lithium) for the propulsion of electric road vehicles - Performance and endurance tests</li> </ul>	<b>Pb, NiCd, NiMh, Na/NiCl2</b>	<ul style="list-style-type: none"> <li>• <b>EV, HEV</b></li> </ul>
<ul style="list-style-type: none"> <li>• <b>IEC 62660-1 (01-2011):</b> Secondary batteries for the propulsion of electric road vehicles - Part 1: Performance testing for lithium-ion cells</li> </ul>	<ul style="list-style-type: none"> <li>• <b>EN 62660-1 (end 2010):</b> Secondary batteries for the propulsion of electric road vehicles - Part 1: Performance testing for lithium-ion cells</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Lithium</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>EV, HEV</b></li> </ul>
<ul style="list-style-type: none"> <li>• <b>IEC 62660-2 (01-2011):</b> Secondary batteries for the propulsion of electric road vehicles - Part 2: Reliability and abuse testing for lithium-ion cells</li> </ul>	<ul style="list-style-type: none"> <li>• <b>EN 62660-2 (end 2010):</b> Secondary batteries for the propulsion of electric road vehicles - Part 2: Reliability and abuse testing for lithium-ion cells</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Lithium</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>EV, HEV</b></li> </ul>

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ISO	CEN	Battery Element	Application types
<b>•For battery system in cars</b>			
<b>ISO 6469-1</b> (2009) Electrically propelled road vehicles -- Safety specifications -- Part 1: On-board rechargeable energy storage system (RESS)	•If needed		•EV, HEV
<b>ISO 12405-1</b> (2011?) Electrically propelled road vehicles-Test specification for Lithium-Ion traction battery packs and systems - Part 1: high power applications	•If needed	•Lithium	•EV, •HEV
<b>ISO 12405-2</b> (2011?) Electrically propelled road vehicles-Test specification for Lithium-Ion traction battery packs and systems - Part 2: high energy application	•If needed	•Lithium	•EV, •HEV
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<p><b>Key Findings</b></p> <ul style="list-style-type: none"> <li>➤ <b>Battery standards necessary for EV/HEV markets exists and/or are in a revision process and will be finalized in 2012</b></li> <li>➤ <b>Most of the standards developed at worldwide level (IEC/ISO)</b></li> <li>➤ <b>Start-Stop battery standardization is EU driven (pr EN50342-6)</b></li> <li>➤ <b>Cenelec Focus Group on Electrical Vehicles standardization</b> EU should consider existing standards and regulations before taking decisions for new European projects related to electro-mobility, to ensure that no double work would need to be carried out.</li> </ul>
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**CENELEC** **Focus Group EV**

- **Includes all major stakeholders (50)**
- **6 (soon 7) Project Teams to take account all aspects for internal market**  
1. Terminology; 2. Connectors; 3. Batteries; 4. Communications; 5. Charging Modes; 6. Regulations and Standards; 7. EMC / EMI to be decided
- **PT 3 Information exchange on current EU rules in Battery Directive, End-of-life Vehicle Directive; and also how to support Battery Exchange**
- **Concern on timely delivery /** mediation on key aspects for Connectors and Charging Modes – what choices to make for Europe; Mandate in March 2011 ?
- **Meetings are held every 6 weeks** in plenary and with PT's in between time to move forward in a difficult environment – but batteries are not the key issue.

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**Key Events**

**IEC Standardization meeting for electric vehicle batteries:**

- Brussels, Belgium, on 31 January – 1 February 2011
- Merger of 3 parts related to propulsion of electric road vehicles
- Discuss performance testing, safety, reliability and 'abuse' tests

**Cenelec Focus Group on Electrical Vehicles standardization**

- Started May 2010: delivery of report March 2011 what and how to standardize

**Cenelec Standardization meeting for Start-Stop batteries:**

- February-March 2011 related to performance and cycling tests at EU level

**Other:** ISO committees for vehicles  
And EU-US Vehicle Workshop on EV and Grid Connectivity (Nov 2010)

**EUROBAT Annual Forum: Barcelona, Spain 26-27 May 2011**

- Battery technologies and case studies electro-mobility

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**EUROBAT Requesting Support on Batteries:**

- **Standardization** of battery systems and components, development processes, performance testings, After Market identification, increase compatibility, EU internal market
- **Research fundings** automotive compliant; for all possible solutions
- **Development** of integration, electronics & monitoring
- **Industrialization:** production processes and supply chains
- **Regulatory Support** investment security End of Life solutions

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**Thank you !**

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