

Battery Integration Workshop

SmartBatt: Introduction

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- Objective:
 - Development of an electric vehicle battery focusing on
 - Minimization of weight
 - Optimization of safety (all kind of possible hazards to be considered)
 - Minimization of costs
 - Design capable for series production

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- 9 Partners from 5 European countries:

- Arsenal Ges.m.b.H (AIT Mobility)
- LKR Ranshofen (AIT LKR)
- Axeon Technologies Limited
- Fraunhofer-Gesellschaft
- Impact Design Europe
- Ricardo UK Limited
- SP Sweden
- Graz University of Technology
- Volkswagen AG



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- Estimated overall costs:
 - 3 M€
- Funded budget
 - 2.25 M€

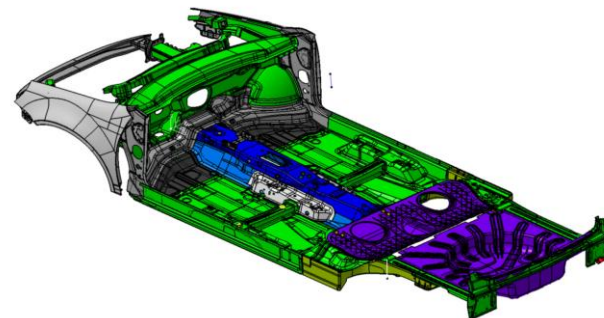
- Timeframe:
 - Started January 2010
 - Ends in December 2012

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- 8 Work Packages:
 - WP 1: Project Management
 - WP 2: Specification Analysis / Requirements
 - WP 3: Concept & feasibility Study
 - WP 4: Risk Assessment
 - WP 5: Design & Development
 - WP 6: Hardware Build-Up & final Validation ← Current WP
 - WP 7: Assessment
 - WP 8: Exploitation

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- WP 2: Specification Analysis and Requirements
 - Definition / analysis of system constraints (Details will be presented by VW)
 - platform of SLC car used
 - 20 kWh energy content
 - 15 % lighter than comparable systems
 - Crashworthiness
 - Identification of existing standards / regulation
 - IEC/ISO
 - FMVSS
 - SAE
 - ECE R100

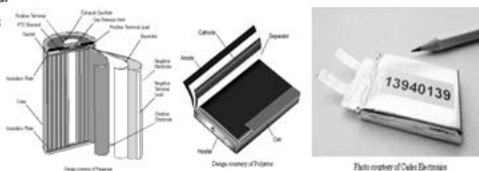


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- WP 3: Concept & feasibility Study
- Definition of interfaces / Battery management System
- Cell selection
- Package room / Battery housing

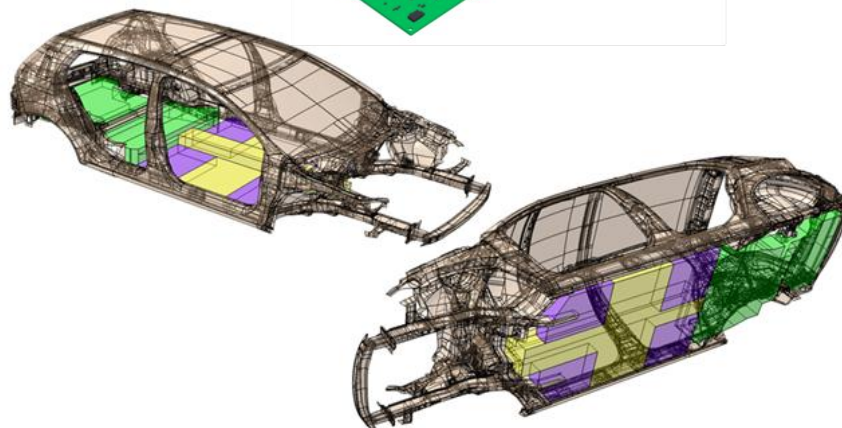
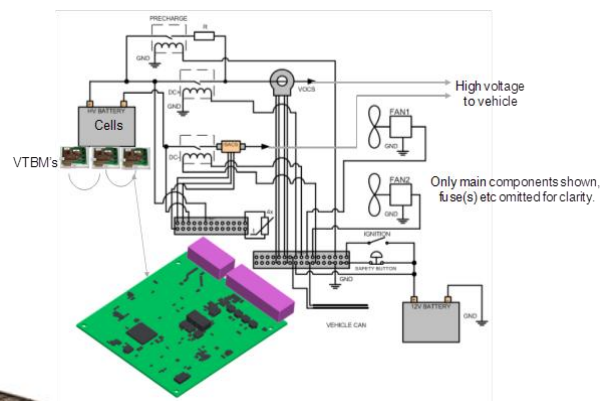
- Cells are available in a variety of packages :

- Cylindrical
- Prismatic
- Pouch



	Cylinder	Prismatic	Pouch	Key:
Energy Density	Medium	High	Highest	■ Desirable
Mechanical Stability	High	Medium	Low	■ Acceptable
Thermal Performance	High	Highest	Medium	■ Undesirable
Space Utilization	Low	High	Highest	
Manufacturing cost	High	Medium	Low	
Pressure Withstand	High	Medium	Low	

- Cell package selection is a trade-off, no one package is universally best



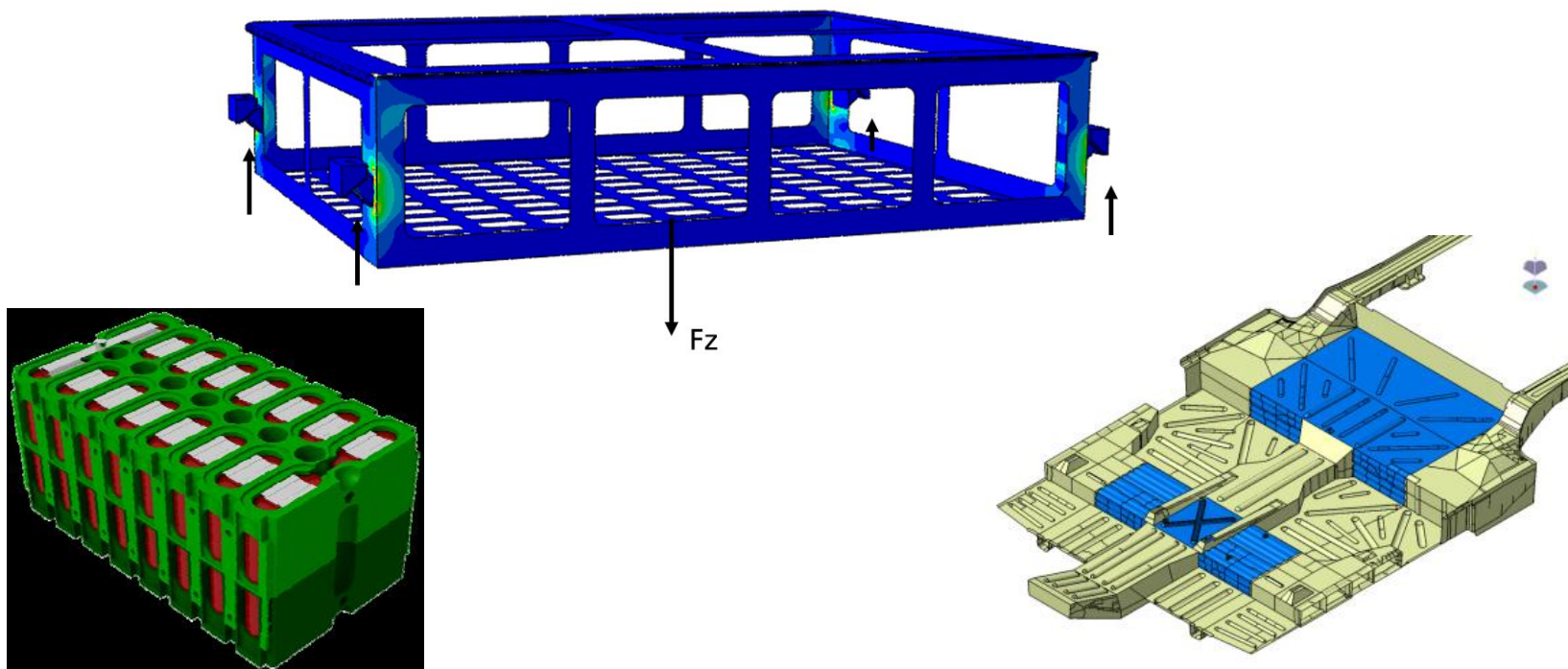
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- WP 4: Risk Assessment (Details will be presented by Ricardo)
- Theoretical Risk and Failure Analysis (e.g. FMEA)
- Experimental Analysis (e.g. Safety tests)



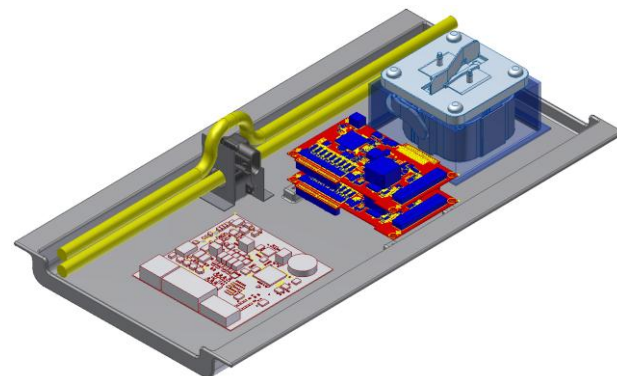
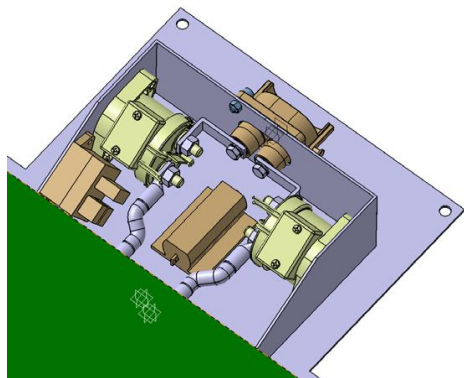
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- WP 5: Design & Development (Details will be presented by VW)
- Design of Housing & Mounting / Simulation based optimization
- Design of modules
- Total weight of 160 kg reached (goal was 169 kg)



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- WP 6: Hardware Build-Up & final Validation (Current WP)
 - Build-up of evaluation model
 - Testings on pack level
 - Mechanical and electrical safety tests
 - Performance tests
 - EMC tests



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- WP 7: Assessment
 - Range improvement
 - Cost savings
 - Impact on standardization (e.g. new materials)
 - Impact on replaceable-energy-storage-system concepts