HELIOS

High energy Li-ion storage solutions

Helios

Motivation and Objectives

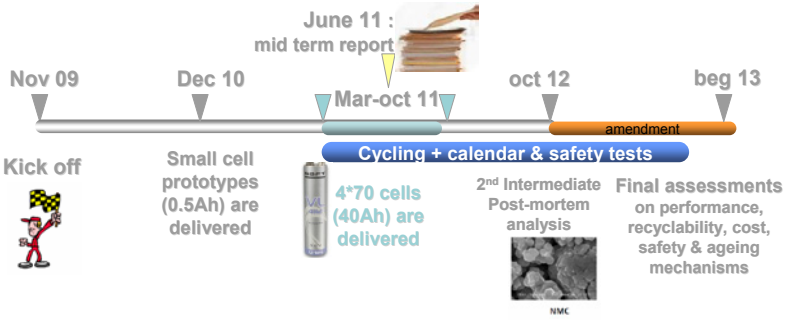
A large consortium including six car manufacturers, laboratories and test institutes, one recycler and battery manufacturers will combine their efforts to understand the causes of ageing of cells and determine among four chemistries the most safe & reliable, the least expensive & the best for recycling efficiency.

The objectives of the HELIOS project are to:

- **Evaluate the performances** of representative large cell formats (**~40Ah cells**) using 4 different positive electrodes for **Electric Vehicles, Plug-in Hybrid Electric Vehicles (PHEV) and Hybrid Heavy Duty trucks applications**,
- Propose safety and cycling test **procedures** for high energy battery cells used in European context,
- Analyse the cell samples "post-mortem" before and after ageing tests to identify for each technology the **ageing and safety mechanisms**,
- Estimate the **recyclability** & perform the **cost evaluation** on the whole battery pack.

Project Plan, Milestones and Deliverables

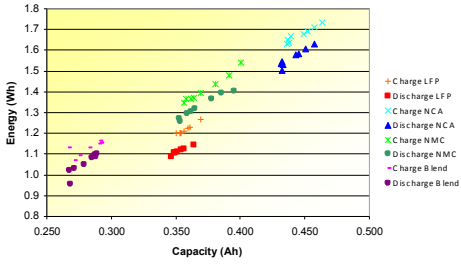
The mid term report has been submitted in June 2011.



Technical Approach

- Select, develop and test four different electrochemical technologies (LFP/C – NMC/C – NCA/C – LMO-NCA/C).
- The project is divided into eight work packages with a lot of interactions.
- Manufacturing and evaluation of 40 large cells (performances, cycling, safety and post-mortem analysis).
- The key issue is the evaluation of performance, safety, life, recyclability and global cost.
- Proposition by OEMs of an European standard for safety and life tests.

Achievements



WP2: Bibliography review on ageing and safety finalised (publication in progress) and characterisation of initial electrode materials.

WP3: Development of cycling & calendar ageing test procedures and safety test procedures by a cooperation of OEMs, research institutes and testing institutes.

WP4: Selection of the most promising cathode materials and manufacturing of 40 small cells (4/5 Ah) and large cells (70 NCA, NMC and LFP).

WP5: Initial characterisation (full check up) done on large cells and most of cycling tests have started.

WP6: Review on thermal reaction mechanisms and safety tests done.

WP7: Economical assessment for active materials.

WP8: Report on potential recycling process.

Budget	4.3 M€	Funding	2.8 M€
Duration	36 months	Start	November 2009
DG	Research / H4 – SST	Contract n°	233765
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Partners	18 partners, among them Renault, CRF, Ford, Opel, PSA, Volvo, CNRS, Uppsala University, RWTH, Umicore, INERIS, ZSW, EDF, Johnson-Controls, AIT, CEA, ENEA & SAFT		
Website	www.helios-eu.org		

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