D1.3 System architecture specification

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1. Publishable Executive Summary

The aim of INCOBAT[1] is to provide innovative and cost efficient battery management systems for next generation HV-batteries. To that end, INCOBAT will propose a platform concept in order to achieve cost reduction, reduced complexity, increased reliability as well as flexibility and higher energy efficiency.

Target of this deliverable is (a) to explain the rationale for systems engineering and SysML method, (b) to describe the advances performed within INCOBAT for SysML modelling for BMS (method and model), (c) to describe the advances performed within INCOBAT for tool interface and tool integration, and finally (d) to conclude with the activities performed toward industrialization of the results achieved.

Main target of systems engineering is to manage complexity, serving as a technical umbrella over the technology domain to identify the cross-dependencies and address these consequently. The three fundamental ingredients to achieve seamless model-based development are identified as:

- a comprehensive modeling theory as semantic domain for formal definition of models
- an integrated architectural model that describes the detailed structure and a process to develop such a model
- an integrated model engineering environment which guarantees a seamless tool support

During the scope of INCOBAT, the BMS system as well as its direct environment (HV battery, powertrain and vehicle elements as appropriate) were modeled. This resulted to 1132 model artifacts in total and 2206 connections between these elements, including and mapping functional, architecture and safety information.

A key aspect was the tool integration – in our case mapping the system information with the SW development framework. During the scope of the project, different tool interfaces for generating AUTOSAR aligned SW information where generated, e.g., for the operating system (OIL file), for the BSW configuration or for the automated generation of HW-SW interface (HSI acc. to ISO26262).

Finally, an industrial deployment has been started, highlighting the impact of systems engineering for AVL.

[1] INnovative COst efficient management system for next generation high voltage BATteries, www.incobat-project.eu