



Optimization of scalaBle rEaltime models and functlonal testing for e-drive ConceptS

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Publishable Executive Summary

The document provides a detailed description of three industrial prospective use cases from OEM and Tier 1 supplier defined as the reference uses cases of cluster 1 “New e-drive concepts and component sizing in earlier design phase”. Main purpose of this cluster 1 is to support methods and tools development to enable a faster workflow for new electric powertrain concepts exploration, powertrain dimensioning and performance assessment for robust concept selection in early phase of the development process. This cluster targets to reach within objectives of OBELICS are: efficiency improvement by 20+% and reduction in development efforts by 25+%.

To support these developments, alternative electric powertrain concepts are explored in this cluster as possible candidates for the development of next generation of electric vehicle for passenger car or heavy duty commercial applications to the ones that are most commonly adopted today. From these powertrain concepts, common sizing process are proposed and derived requirement for models and virtual integration tools are listed supporting electric powertrain concepts analysis and targeting faster workflow execution, optimized powertrain system sizing, cost effective and more efficient EV design in the early phase of the vehicle development process.

To tackle energy efficiency improvement, several possibilities are explored: alternative powertrain architecture and new technology concepts integration enabling higher efficiency operation, components weight reduction through integrated system design to save energy and increase vehicle range; advanced energy management control strategy including thermal management could help to achieve an overall improvement of energy efficiency. Better sizing process can improve how the components are used in the complete system and adjust the operational points to fit in the highest efficiency region of each component. Some of these possibilities will be explored in the proposed use cases to show their potential impact on vehicle energy efficiency improvement.