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Battery Hardware in the Loop

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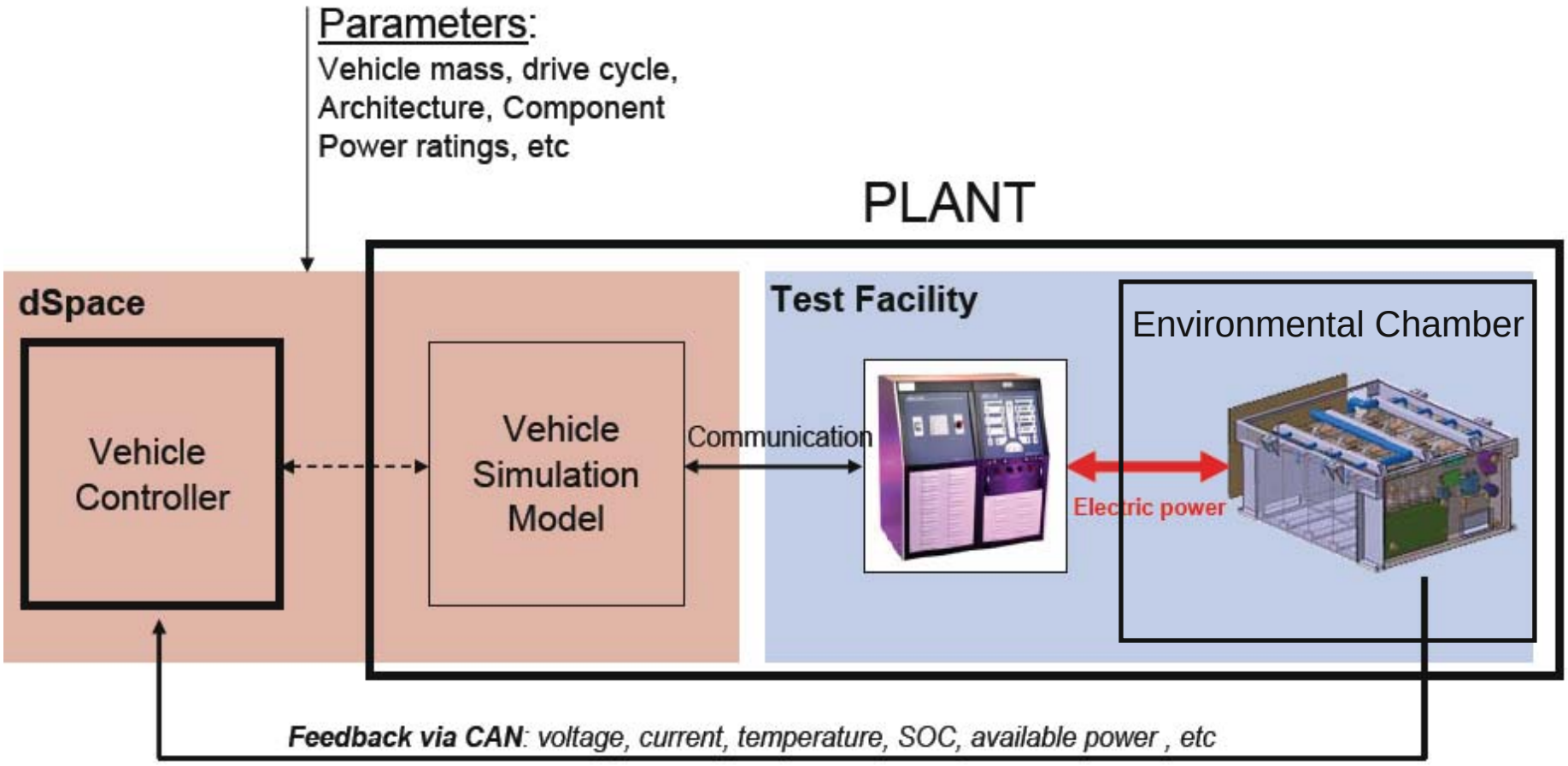
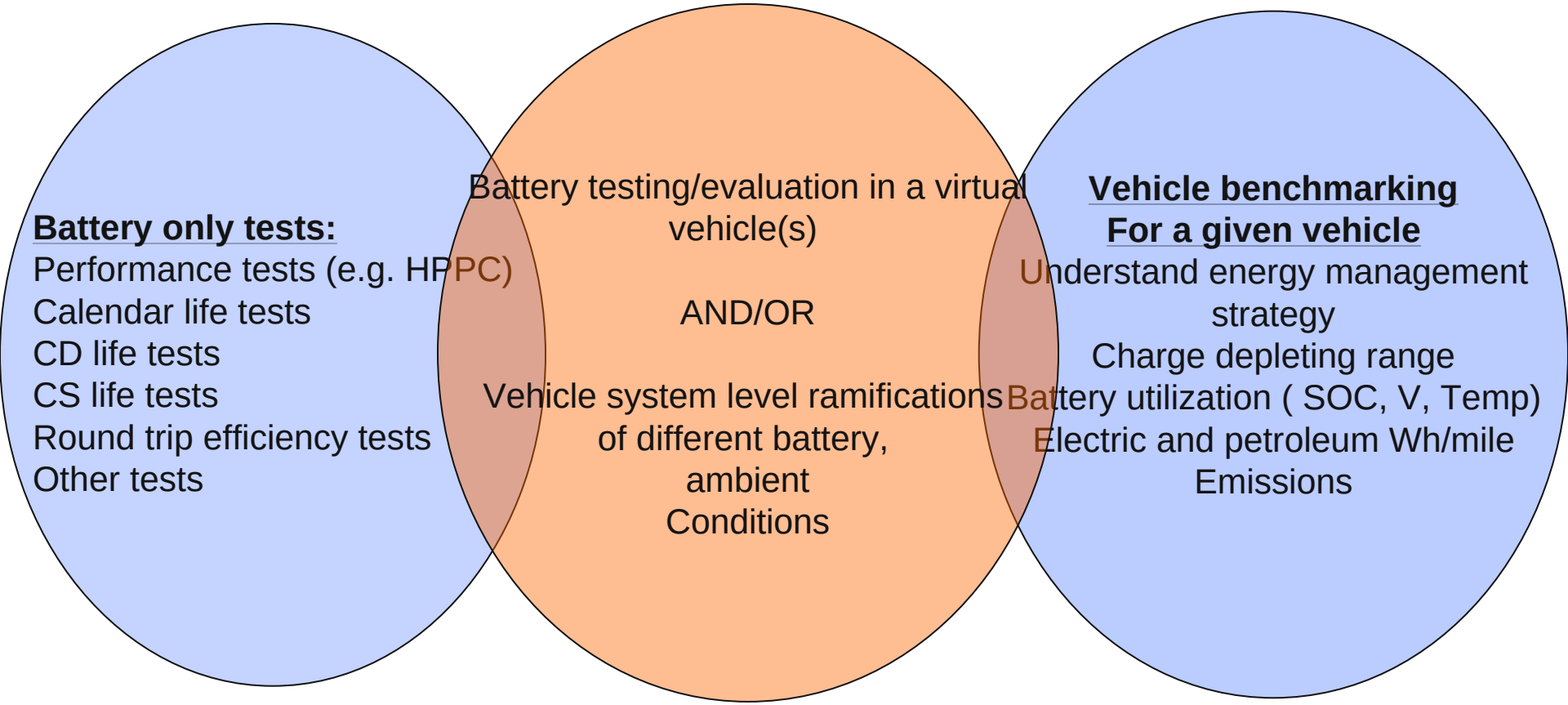
- What is Battery HIL.
- Battery HIL – unique capabilities to complement ‘battery only’ testing and vehicle benchmarking.
- Component (battery) evaluation using HIL.
- Systems integration with Battery HIL
- Current investigations.

Battery hardware in the Loop/Vehicle Simulation in the Loop



Battery Hardware in the Loop capabilities – component evaluation and systems integration



Component evaluation :Battery evaluation in a virtual vehicle

For different vehicle platforms, BHIL can perform

- All Electric range tests at cold, normal and hot ambient conditions
- Interact with battery manufacturer to evaluate blended mode control strategies with a focus on battery life (based on SOC swing, temperature rise, current usage , etc).
- Round-trip efficiency calculations based on dynamometer driving cycles
- Ideal tool for Battery Management System development, tuning and validation
- Ideal tool for battery to battery comparison.

Systems integration: Vehicle level impact of different battery , ambient conditions

- Investigate energy management strategies at low temperature , and restrict battery usage at high temperature
- Impact of the above energy management strategies on petroleum displacement
- Impact of vehicle operation in charge sustaining modes at different SOCs on vehicle fuel economy
- Impact of battery life on vehicle fuel economy, performance etc

Battery hardware in the Loop – current investigations

- SAFT VL41M – liquid cooled.
- 3rd party prototype Li-ion pack for the Prius.
- ‘Active’ power sharing between ultra capacitors and batteries.