M1-3 M4-6 M7-9 M10-12 M13-15 M16-18 M19-21 M22-24 M25-27 M28-30 M31-33 M34-36 WP1: Project management D1.1 ♦ D1.2 ♦ D2.2/3 🔷 *D2.1* ♦ D3.5 ♦ D3.3 ♦ *D3.4* ♦ *D3.1* ♦ *D3.2* ♦ D4.1 ♦ D4.2/3/4/5 • D4.6 ♦ D4.7 ♦ D5.2/3 ♦ D5.4/5/6 ♦ D5.1 ♦ D6.1 ♦ D6.2/3 ♦ D6.4/5 ♦ D6.6 ♦ $D7.1 \blacklozenge D7.2 \blacklozenge D7.3 \blacklozenge D7.6 \blacklozenge$ D7.6 ♦ D7.6 ♦ D7.3/4/6 ♦ D7.5/6 ♦

WP1.1: Project coordination

WP2: Requirements Specification & Overall System Modelling Strategy

WP2.1: Define the HEP

WP2.2: Set up requirements for the HEP-Twin

WP2.3: Map out the faults and degradation

WP2.4: Creating guidelines on maintenance procedure for HEP

WP2.5: Requirement for life assessment for digital twin

WP3: Smart in-flight battery sensing

WP3.1: Specifications for sensors on energy storage system

WP3.2: In-operando monitor of the battery cell

WP3.3: Characterization and validation of the monitoring systems for energy storage

WP4: Integrated intelligent sensing for electric power distribution

WP4.1: State of the Art sensing systems for power electronics and electrical machines

WP4.2: Development of degradation and fault analysis models for multi-level inverters and associated components

WP4.3: Online temperature mapping with novel acoustic sensors

WP4.4: High voltage cables diagnostic and prognostic evaluations

WP4.5: Fault's progression and degradation analysis of electrical machines and development of sensors

WP4.6: Development of AI and MBSA for fault detection and identification

WP4.7: Offline and online stochastic reliability model deployment and system-level PHASED research impact assessment

WP5: Integrated HEP ground tests

WP5.1: Defining the specification of the test rig based on sizing and selecting the component

WP5.2: Design the demonstrator and demonstrator preparations

WP5.3: Create test cases, testing, and validation

WP5.4: Degradation emulator with Software and Hardware in the Loop

WP6: Digital-twin driven central decision making

WP6.1: Review existing standards

WP6.2: Data standards for CDM and communications

WP6.3: Create a design methodology for the CDM

WP6.4: Integrated real time virtual load sensors development for the engine

WP6.5: Machine learning models to create the CDMS

WP6.6: Processing resources

WP6.7: Characterisation and validation of the models adopted for CDMS through case studies

WP7: Dissemination, communication & exploitation

WP7.1: Dissemination & Communication Plan and Activities

WP7.2: Exploitation Plan and Activities

WP7.3: Event organization