

# Battery training

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## Introduction

This training seeks to give the participants the main notions about the batteries of electric vehicles that are in the manufacturing process within the framework of the SOLUTIONSplus project. Some examples of producers and suppliers of battery packs of different types will be presented. Likewise, fundamental notions about the sizing and selection of batteries will be presented, where technical aspects such as connectors, communication, and technical aspects about the elements of the electric vehicle that are linked in some way to the battery pack will be included.

**Dates:** May 16<sup>th</sup> – 20<sup>th</sup>, 2022

**Target audience:** SOL+ start-ups & battery researchers

**Language:** English

## [Registration Link](#)

### Structure of the training – preliminary agenda

#### Unit 1: Battery options

**Date & hour:** Monday May 16<sup>th</sup> at 14:00 CEST

**Duration:** 1h30

**Lead & moderation:** FIER

**Description:** Battery options (swapping, modular, 2nd life, etc.). This will include the presentation of different battery providers / solutions that could help the start-ups understand the different options available in the market.

Topic	Panelist
SOL+ Star-up incubator (10 min)	Lidia Buendía Peña <i>Support Manager Innovation &amp; Deployment</i> ERTICO
Battery overview (15 min)	Edwin Bestebreurtje <i>Partner</i> FIER
2 <sup>nd</sup> life batteries, the case of Betteries (15 min)	Dr. Núria González-García <i>Head of Research and Technology</i> Betteries
Battery swapping, the case of Swobbee (15 min)	Sinah Truffat <i>International Expansion Manager</i> Swobbee
Q&A session	30 min

## Unit 2: Battery selection parameters

**Date & hour:** Tuesday, May 17<sup>th</sup> at 14:00 CEST

**Duration:** 1h30

**Lead:** UEMI / WI

**Moderation:** Reyhan Safari (FIER)

**Description:** This module will include the main concepts about battery parameters such as the type of cells (lithium-ion) and battery pack. The battery BMS communication with other vehicle components will be presented as well as the requirements for battery connectors.

Topic	Panelist
1) Selection and technical features of on-board battery chargers (15 min) 2) Communication between BMS and VCU (15 min)	Vittorio Ravello <i>Automotive Research &amp; Advance Engineering Centro Ricerche Fiat (CRF)</i>
Integrating Batteries into E-quads: Key Technical and Practical Considerations (15 min)	Dr. Jose Bienvenido Biona <i>Technology Advisor Tojo Motors – The Philippines</i>
Second life batteries for light electric vehicles purposes (15 min)	Juan Carriquiry <i>Researcher Faculty of Engineering (UDELAR) - Uruguay</i>
Q&A session	30 min

## Unit 3: Interactive training with the start-ups on battery sizing

**Date & hour:** Wednesday, May 18<sup>th</sup> at 14:00 CEST

**Duration:** 1h30

**Lead & moderation:** IDIADA

Topic	Panelist
Sizing 1: Setting the vehicle targets: <ul style="list-style-type: none"> <li>- Business model impact on target setting</li> <li>- Business model example. DST</li> <li>- Use case identification and data acquisition</li> <li>- Use case example. Barcelona bus line electrification</li> <li>- Definition of vehicle targets</li> <li>- Competitors benchmarking</li> <li>- Minibus Use Case</li> <li>- Handout work</li> </ul>	Didac Sabria <i>Virtual Development Team IDIADA</i>

#### Unit 4: Interactive training with the start-ups on battery sizing

**Date & hour:** Thursday, May 19<sup>th</sup> at 14:00 CEST

**Duration:** 1h30

**Lead & moderation:** IDIADA

Topic	Panelist
Sizing 2: Vehicle targets cascading for battery sizing: traction requirements <ul style="list-style-type: none"> <li>- Estimate vehicle running resistance</li> <li>- Calculate vehicle traction requirements for the different targets</li> <li>- Define tractive force and power at wheel</li> <li>- Define battery target power</li> <li>- Competitors benchmarking</li> <li>- Handout work</li> </ul>	Marina Roche <i>Powertrain Integration Team</i> IDIADA

#### Unit 5: Interactive training with the start-ups on battery sizing

**Date & hour:** Friday 20/May. 14:00 CEST

**Duration:** 1h30

**Lead & moderation:** IDIADA

Topic	Panelist
Sizing 3: Vehicle targets cascading for battery sizing: energy requirements <ul style="list-style-type: none"> <li>- Pre-process user cycles</li> <li>- Calculate tractive power demands from user cycle</li> <li>- Calculate electric power demands considering driveline efficiency and regenerative brake</li> <li>- Additional consumers</li> <li>- Define battery target capacity</li> <li>- Energy requirements validation</li> <li>- Competitors benchmarking</li> <li>- Handout work</li> </ul>	Marina Roche <i>Powertrain Integration Team</i> IDIADA

## **Unit 6 - Follow-up session**

**Date & hour:** May 25<sup>th</sup> at 14:00 (CEST)

**Duration:** 2h00

**Lead & moderation:** IDIADA

Final session to present the final homework of the startups with the sizing activities and share Q/A.