

1
September
2018

iModBatt

OBJECTIVES

iModBatt is a Large Scale Collaborative Project within the H2020 leading to design and manufacture, with the minimum environmental impact, a high energy density modular Battery Pack, which is flexible enough to be used in automotive and small stationary applications

- Increase of battery pack energy density, based on an already existing breakthrough modular battery concept.
- Reduction of the battery pack integration cost by automated smart manufacturing unit & optimization of recyclability during manufacturing.
- Enhance the value of European SMEs and large industries by their leadership in the project.
- Battery pack design and manufacturing ruled by eco-design recommendations and defining a smart recycling methodology.
- Battery pack second life and/or reuse as a feasible option.

iModBatt: INDUSTRIAL MODULAR BATTERY PACK CONCEPT FOR AUTOMOTIVE APPLICATIONS

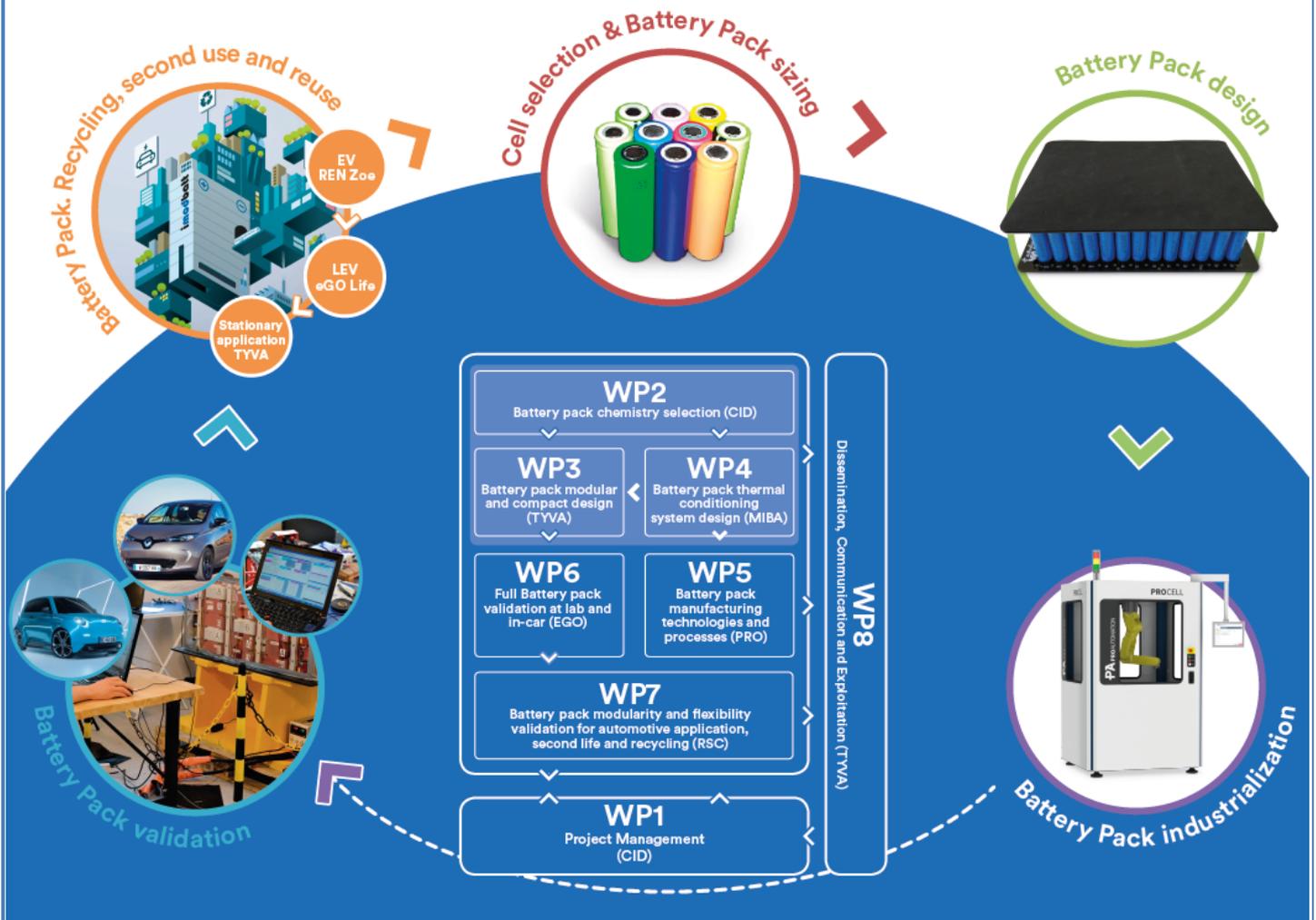
GV-06-2017

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770054



THE CONCEPT

- The project concept is built around an already existing technologically breakthrough, modular battery pack design primarily developed for specialty applications, that has proven excellent performance and cost efficiency in such a manner that higher ambition, wider spread electric vehicle applications seem the natural next developmental step for such a concept.
- The project focuses into maximization of the energy density of a lithium ion pack through the optimization of the structural design and components of a battery pack for a given cell form factor. In this sense the strategy is to increase the energy density by reducing the weight of the battery pack while keeping structural integrity and easy assembly and manufacturing. Chemistry and BMS work is beyond the scope of the project, which focuses in the structural design and manufacturing.



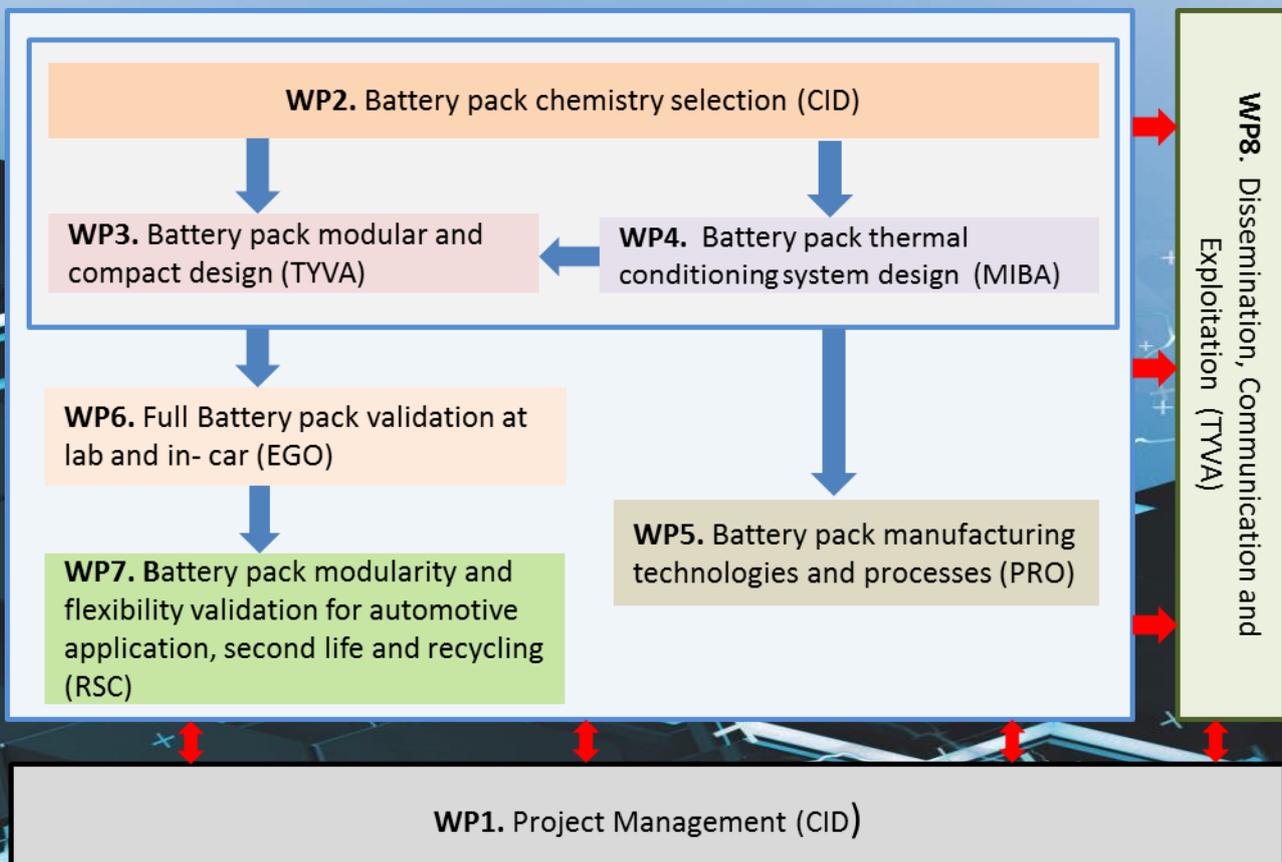
GV-06-2017

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770054



BACKGROUND & CHALLENGES

- It is known that lithium ion (Li-ion) battery technology, with all its advantages in performance, is nevertheless still far from preventing the range anxiety effect on vehicle users. Several challenges are being addressed in the state of the art at cell electrochemistry and BMS development levels but these approaches are out of the scope of this project. The challenge is, then, to maximize the energy density of Li-ion packs through the optimization of the structural design and components of a battery pack (BP) for a given cell form factor. In this sense the strategy is to increase the energy density by reducing the weight of the BP while keeping structural integrity and easy assembly and manufacturing.
- On the other hand, vehicle manufacturing is one of the most important businesses worldwide and specifically for Europe is one of the pillars of our economy, both for all the direct and indirect labour generated around automotive industry. European industry must offer a product whose life time is optimized for the intended application and can be easily extended. Besides the cell, a BP is composed of structural materials to keep the safety of the BP, electrical components to drive the energy and power of the battery and the cooling system to thermally balance the BP. All the knowhow to design and manufacture them is available within European SMEs and large industries.
- Additionally, iModBatt addresses eco-design of the BP, environmentally friendly considerations towards the BP manufacturing process and use of automated manufacturing from the perspective of minimizing the ecological footprint of the product to be developed and improving the current method of BP parts recovery in the recycling process.



GV-06-2017

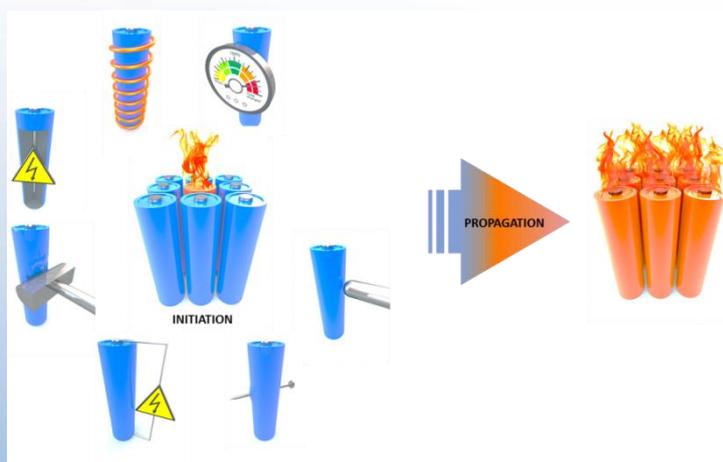
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770054



Workshop: Safer Li-Ion Batteries by Preventing Thermal Propagation?, Petten (NL), March 2018

Within the context of the Directorate-General Joint Research Centre (JRC) Exploratory Research Activities, a Workshop was organised entitled "Safer Li-Ion Batteries by Preventing Thermal Propagation?". This 2 day workshop discussed the current state-of-the-art of thermal propagation testing:

- Thermal runaway: mechanisms and influencing factors
- Thermal propagation
- Thermal runaway initiation methods, fit-for-purpose testing related to external and internal abuse triggers
- Safety strategies; methods for detecting, mitigating and preventing thermal propagation; anti-cascading strategies
- Cost and performance penalty of mitigating thermal propagation
- Impact of avoiding thermal runaway propagation on the current safety testing landscape



Among participating experts, CEA and Cidetec were invited and contributed to the debate since analysis on thermal runaway is one of the chapters analysed in the project.

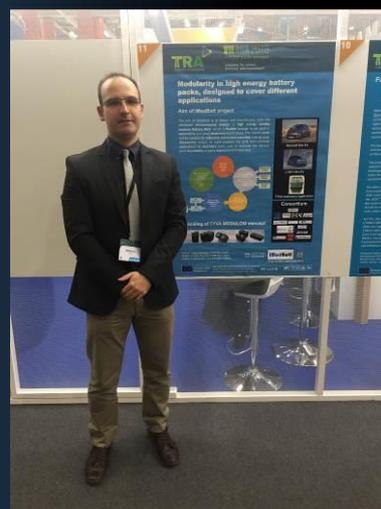
<https://ec.europa.eu/jrc/en/event/workshop/workshop-safer-li-ion-batteries-preventing-thermal-propagation>

iModBatt presented in the 7th European Transport Area (TRA), Vienna (AT), April 2018

iModBatt first participation in a public event was in the TRA 2018, celebrated in Vienna, on last 16-19th of April. <https://www.traconference.eu/>

iModBatt was represented by its coordinator, Iosu Cendoya (Cidetec), who shared the aim of the project in a poster format.

iModBatt was launched in October 2017, so the main target of this event was to present our core idea to the audience and meet interested partners and stakeholders in order to find common goals in coming months.



GV-06-2017

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770054



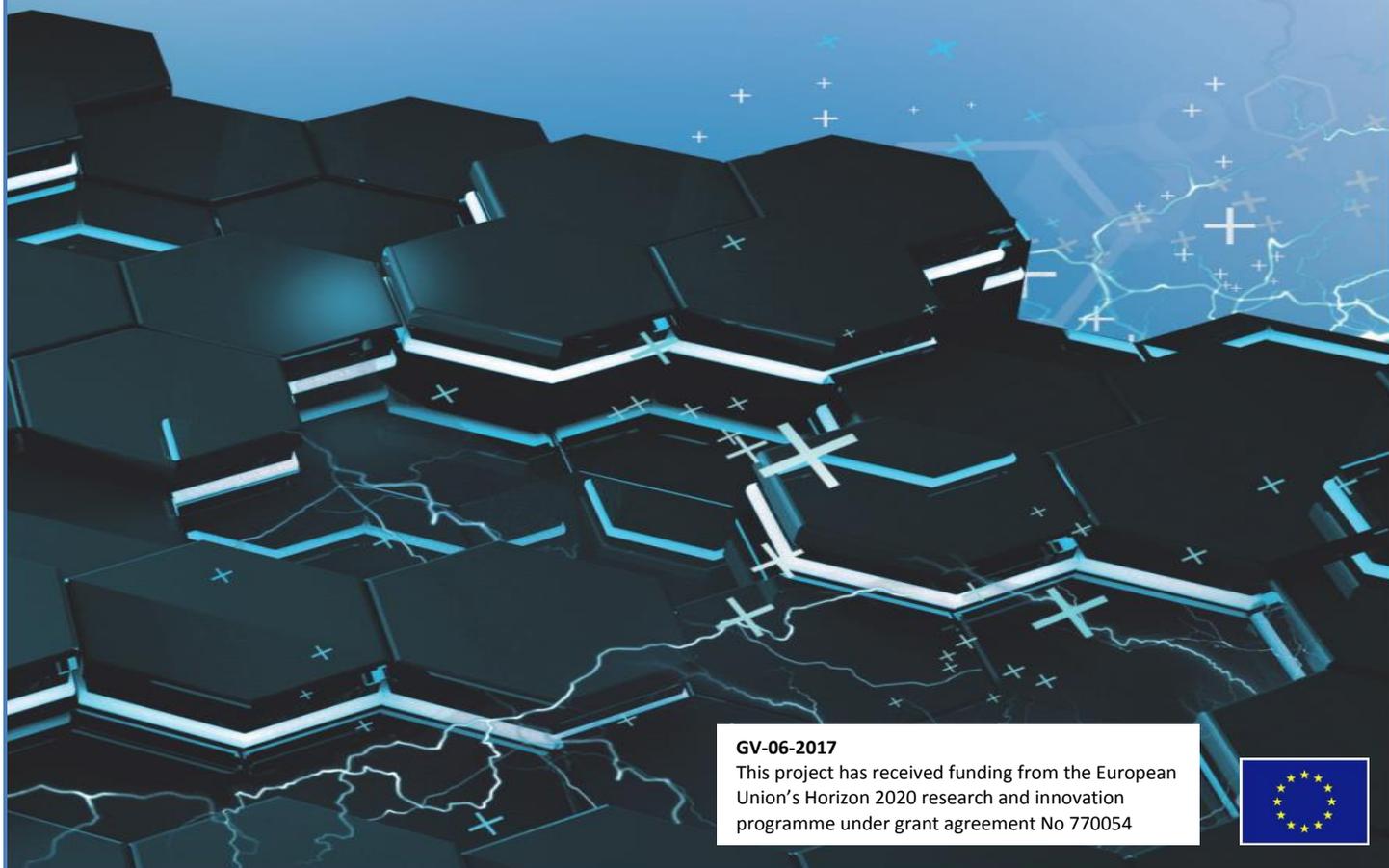
M6 iModBatt progress meeting, Guyancourt (FR), April 2018

The first technical progress meeting of iModBatt took place in the Technocenter Renault, Guyancourt on last April 24-25. The project was launched in October 2018 and a Kick-off meeting organized by Cidetec in their main site, in San Sebastian, Spain.



The activity in these first 6 months of the project was focused on commercial cells selection under technical, economic and ecological criteria (WP2). First steps for the electrical, thermal and mechanical design of the battery pack were given (WP3, WP4), but the core of this activity would be developed in following months.

Recyclability, second use and reuse concepts (WP7) were launched but the development of those topics would be accelerated as soon as the battery pack design would be closed. In the same way, it was still too early to discuss in detail the concerns related to the module automated assembly (WP5). Some discussion on the protocols to integrate the battery packs into the Renault Zoe and e.GO Life vehicles was launched, whose steps will be defined along the project.



GV-06-2017

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770054



UPCOMING EVENTS

Batteries Event, Nice (FR), October 2018

For 19 years, the Batteries event still remains one of the World's most attractive event and the meeting place of technologies (lead acid, NiMH, Li-ion, Post Li-ion), applications (from micro batteries to large format batteries) and of the value chain (chemists OEMs and end users)... Batteries 2018 will focus on battery market issues, latest trends.
<https://www.batteriesevent.com/>

TYVA ENERGIE will participate in this event with the oral communication "The ultra light, modular and affordable Lithium-ion battery for automotive and home storage applications", in which the approach of iModBatt to modularity and flexible design concept will be explained.

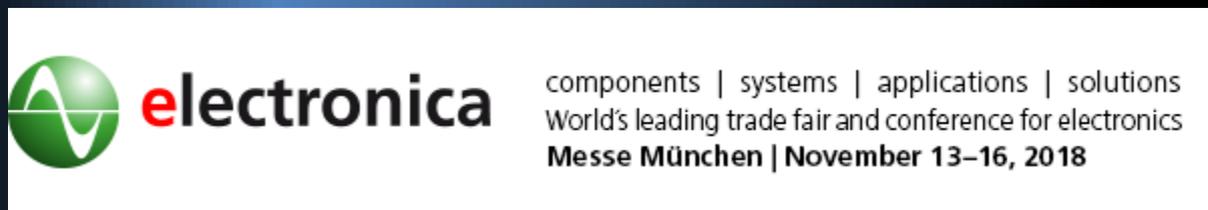


The banner features a globe on the left with icons for various battery types. The main text reads: "20TH EDITION", "October 2nd - 5th 2018", "Nice Acropolis, France". It also includes the website "www.batteriesevent.com", the tagline "The International Energy & Power Supply Conference and Exhibition", and the sponsor "Created & Chaired by avicenne ENERGY". At the bottom, it says "Business Meeting & Networking - www.batteriesevent.com".

Electronica Munich (DE), November 2018

Electronica is the international trade show for electronic components, systems and applications and shows as the world's leading trade fair the full range in all its diversity in width and depth: <https://electronica.de/index.html>

TYVA ENERGIE will represent iModBatt at Electronica from the 13th to the 16th of November 2018, with an exhibition booth and an oral communication.



The logo for Electronica features a green circle with a white waveform. To its right, the text reads: "electronica components | systems | applications | solutions", "World's leading trade fair and conference for electronics", and "Messe München | November 13-16, 2018".

GV-06-2017

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770054



UPCOMING EVENTS

International EV Batteries 2018: Cost-Effective Engineering for Hybrid and Electric Vehicles, London (GB), November 2018

International EV Batteries 2018 brings you cutting-edge technical updates from leading OEMs, international researchers and regulators. Benefit from this unique opportunity to hear from mechanical engineers on how they are cost-effectively increasing vehicle range, enhancing performance and improving battery durability. Hear about the latest developments in charging technologies, materials, thermal management and battery management systems. <http://events.imeche.org/ViewEvent?e=6622#>

Cidetec will talk on the "Selection of commercial cells to fit a multiple purpose modular battery pack concept: imodbatt". The talk will show the followed steps for the selection of cells, so that these cells are suitable for both a EV (Renault Zoe) and LEV (e.Go Life) application, keeping in mind the reusability and second life concepts through a modular battery pack.



International EV Batteries 2018: Cost-Effective Engineering for Hybrid and Electric Vehicles

Advanced Automotive Battery Conference, Strasbourg (FR), January 2019

Each year, AABC Europe brings together a global audience of battery technologists and their key suppliers for a must-attend week of development trends, breakthrough technologies and predictions of the market for years to come. Our 2018 event was the largest AABC event ever with 1,000 attendees from 35 countries taking part in interactive discussions on the development and future market trends for vehicle electrification. <http://www.advancedautobat.com/europe/>

ACCUREC will participate with an oral communication about "The role of battery recycling in raw material supply for EV application".



GV-06-2017

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770054



iModBatt

PARTNERS

- The Consortium includes industrial partners of every step of the battery pack value chain, including automotive OEMs, battery parts manufacturers as well as leading European research centres with ample experience in the field of batteries.

cidetec >
energy storage



iModBatt Project Coordination:
CIDETEC Energy Storage
Pº Miramón, 196
20014 Donostia-San Sebastián,
Spain
Tel.: +34 943 30 90 22
e-mail: imodbatt@cidetec.es
www.cidetec.es/imodbatt/en/
Iosu Cendoya (CIDETEC),
Coordinator

- ① CIDETEC
San Sebastián, Spain
- ② Rescoll
Pessac, France
- ③ Tyva Energie
Annonay, France
- ④ Miha
Laakirchen, Austria
- ⑤ Hexagon Studio
Besiktas Istanbul, Turkey
- ⑥ RWTH Aachen University
ISEA – Institute for
Power Electronics and
Electrical Drives
Aachen, Germany
- ⑦ Freemens
Grenoble, France
- ⑧ Austrian Institute
of Technology
Wien, Austria
- ⑨ Cleancarb Sàrl
Kopstal,
Luxembourg
- ⑩ e.GO Mobile AG
Aachen, Germany
- ⑪ Accurec Recycling
GmbH
Krefeld, Germany
- ⑫ Pro Automation
GmbH
Wien, Austria
- ⑬ CEA
Paris 15, France
- ⑭ Renault
Boulogne
Billancourt,
France

GV-06-2017

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770054

