eVolution2Grid

Vehicle to Grid model and prototype solution

Enjoy reading the eVolution2Grid newsletter!

"V2G-eVolution 2 Grid" is a research innovation project funded under the Programme Electric Mobility Europe 2016 and coordinated by IREN, and with the participation of 3 more partners from 3 European countries. The overall objective of the project is to contribute to a zero CO2 emissions future, developing testing and optimizing an integrated V2G solution composed by a light quadricycle enabling V2G, a bidirectional V2G – enabling charging infrastructure and an Energy Management and Control System (EMCS).

Twice a year the project will publish a newsletter to inform the public about the main progresses and results achieved. In this first issue of the eVolution2Grid newsletter, an overview of the partners involved and their role in the project is provided.

PROJECT SUMMARY

The V2G consortium is composed by 3 companies (1 large company and 2 SMEs) and a university, all coming from European countries and regions directly participating to the EME Programme. In particular, the partners are: IREN (coordinator, Large company, ITA), MECAPROM (SME, ITA), CTC (SME, GER) and Aalborg University (university, DEN).

During the project, partners will test the novel V2G integrated solution in real simulated conditions of two case studies (public and household), evaluating benefits and obstacles at technological and regulatory level, assessing its business potential and creating awareness about the results of the project, engaging stakeholders, public administrations, car owners, etc.

The main project objectives are the following:

1. **To develop, test and optimize an integrated V2G solution composed by:**

- A prototype light quadricycle enabling V2G (from a construction, Battery and Battery Management System point of view) with an innovative patented body which allows significant weight and consumption reduction compared to traditional vehicles of the same size,
- A bidirectional V2G-enabling charging infrastructure designed and implemented in both residential and public contexts,
- An Energy Management and Control System (EMCS) able to properly manage the energy exchanges with the grid satisfying at the same time users and network/market needs.

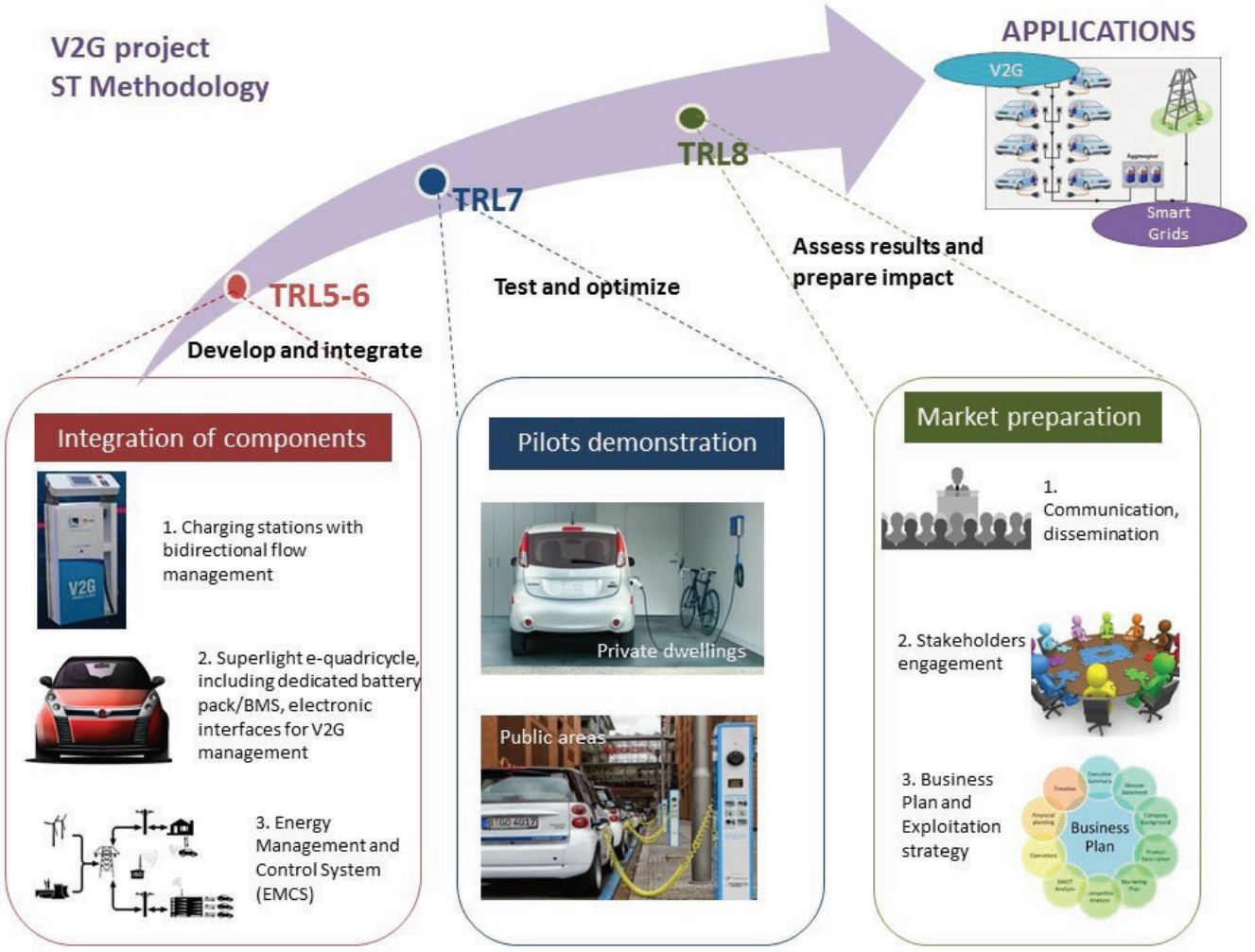
2. **To test the solution in real simulated conditions**: The pilots for both the application contexts, considered in the project, will be set up at IREN premises.

3. **To assess the Legislations and Standards development**: The project will monitor the legislative aspects for V2G deployment in EU and project partner countries.

4. **To assess and evaluate the benefits and obstacles** of integrating the needs and purposes of the involved stakeholders in the future dispatching market open to aggregated consumers, prosumer storages and production.

5. **To assess the business potential of the novel V2G solution** based on the evolving European EM market, with the aim of fostering market introduction.

6. **To create awareness and communicate** about the results of the project, engaging all the involved stakeholders: industrial and utility players (automotive industry, charging point operators, Aggregators, DSOs, etc.), public administrations and car owners, citizens and end users.



PROJECT IMPACT

The V2G project will create substantial impacts in Europe, in line with the Objectives of the EMEurope Call 2016, i.e.:

- Accelerate the time to market for solutions for integrating electric mobility in Europe's (sub-) urban mobility systems.
- Establish and activate a network of policy decision makers and stakeholders for exchanging know-how and experiences on electric mobility solutions for European urban areas.
- Support industry, service sector, politics, authorities and users in their efforts to develop suitable and feasible solutions for electric mobility (EM); Link policy, science and industry.
- Contribute to the EU White Paper objective to promote zero emission mobility in EU cities.
- Anticipate information/research trends and policy demand needs in 2020 and beyond.
- Focus on passenger transport while considering urban freight and logistics.
- Consider issues of interoperability and compatibility.
- Provide new knowledge on efficiency, social aspects, regulation and conditions for market uptake.
- In addition, the deployment of Smart Grids provides an opportunity to boost the future competitiveness and worldwide technological leadership of EU technology.

THE KICK OFF MEETING (Turin, Italy) AND GENERAL ASSEMBLY (Böblingen, Germany)

eVolution2Grid: Kickoff Meeting

On June 18th 2018, the project partners gathered in Turin for the official Kick-off Meeting of eVolution2Grid.

The meeting focused on partners and project presentation, work packages presentation, project dissemination activities, and the project milestones.

PARTICIPANTS

Iren: Federico Boni Castagnetti, Gabrio Moresi, Viviana Persico, Giuliana Galofaro, Andrea Stefano

Mecaprom: Michele Pennese, Francesco Giordano

CTC: Alexander Kohs, Wolfgang Zerweck

Aalborg University: Erik Schaltz

Ciaotech (subcontractor): Andrea Rausa

eVolution2Grid: General Assembly Meeting

On January 15th, 2019 the project partners gathered in Böblingen, Germany at CTC premises for the 1st GA Meeting of eVolution2Grid.

The participants introduced and discussed the main activities of their work packages, the status of their work and the plan for the next steps.

PARTICIPANTS

Iren: Federico Boni Castagnetti

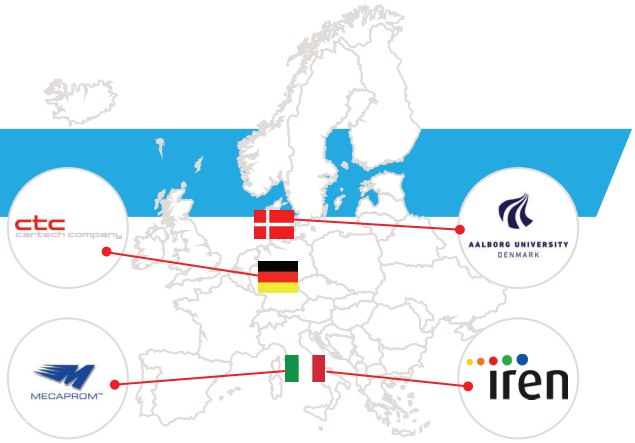
Mecaprom: Enrico Bianconi

CTC: Hisham AL Ashkar, Oliver Schmalbach, Praveen Kuppusamy, Thaer Allahham, Alexander Kohs, Wolfgang Zerweck

Aalborg University: Erik Schaltz

Ciaotech (subcontractor): Andrea Rausa, Fortunato Palma Esposito

V2G PROJECT PARTNERS AND ROLES



IREN

IREN, a Multi-utility Company listed on the Italian Stock Exchange, operates in the sectors of electricity (production, distribution and sale), thermal energy for district heating (production and sale), gas (regasification, distribution and sale), the management of integrated water services, environmental services (collection and disposal of waste) and energy services.

IREN is structured as an industrial parent company with its main corporate offices in Reggio Emilia, operating units in Genoa, Parma, Piacenza, La Spezia and Turin, and separate companies in charge of the individual business lines. Iren S.p.A. handles strategic, development, coordination and monitoring activities, while the four operating companies ensure the coordination and development of the business lines:

- IREN Energia in the electricity and heat energy production sector and the technological services sector;
- IREN Mercato as regards the sale of electricity, gas, district heating and innovative services (eg. E-mobility and New Downstream));
- IRETI in the gas and electricity distribution business and in the integrated water service;
- IREN Ambiente in the waste collection, in the design and management of waste treatment and disposal plants and in the renewable energies sector.

Role played in the project

The company will be involved into the following activities:

overall project management, coordination and reporting about technical, administrative and financial aspects; evaluation of future regulation and technical requirement for V2G; design, optimization and pre-validation at advanced prototype level of the system interface for managing the electricity exchanges with the grid (EMCS – Energy Management and Control System); Analysis of the future impact of a V2G on electric networks and future energy markets. Moreover, in collaboration with other project partners, IREN will deploy the integration of the different components (e-quadricycle, charging station and EMCS) in two pilots (for domestic and public applications), testing and optimization of the solution.

CTC

CTC develops and manufactures customised electronic devices and applications for the automotive industry in general and specifically for electric vehicles, controllers, test and measurement devices. The present product range includes control systems for drive units, solutions for automated testing, sensors, controllers for electric motor driven actuators, test and measurement systems, solar and mains powered charging systems as well as cable harnesses and electromechanical components. The company is fully certified according to DIN EN ISO 9001:2015. Company's headquarters are situated in Böblingen and in Esslingen in Germany.

CTC permanently works on innovation within research and development projects and invests in technologies and qualification of its employees as well electrical drive trains, measurement and testing procedures, sensors, controls and automation define the strategic approach which couples the company within the megatrends of mobility and energy technology. CTC develops algorithms and tools for the analysis of battery cells, modules and stacks, covering all domains along the entire battery lifecycle: development, production, logistics, integration, operations, 2nd use applications and recycling

Role played in the project

The strategic market scenarios, which will be covered by the project, require fully adapted energy systems, in terms of saving and transferring the energy bidirectionally. CTC will develop an adapted Battery Management System, which ensures proper functionality of the battery by monitoring important cell parameters, by determining specifications and developing HW and SW as well as prototyping the BMS component and charging interfaces. Additionally, CTC will participate to the test's evaluation, and will lead techno-economic assessment and support business evaluation. On the side, CTC, a company with high European and international footprint, will coordinate the exploitation and dissemination activities to ensure the proper valorization of project's results, with the collaboration of all partners.

MECAPROM

Mecaprom was founded in 1960 as a development company for automotive engineering and prototyping. The company is present in 9 countries with 12 operating units. In Italy Mecaprom operates in **Turin (Piedmont Region)**, Imola, Arese and Naples. Mecaprom is a company that operates in the domestic and international market as a leader in the development of powertrain and drive-line systems. Engines and transmissions have always been the center of attraction of our best resources: the core of an international group that has been able to develop meaningful innovations to achieve the highest levels of excellence in design and realization. The solutions and the conceptual proposals are made on the basis of inputs provided by customers, the reference standards of the final product, bearing in mind the reduction of costs and time-to-market. Mecaprom customers' portfolio include major automotive industry leaders who operate globally, such as Audi, FCA, GM, Iveco, Piaggio, Avtovaz.

Role played in the project

In V2G project, MEC will be mostly involved in:

Capture of the vehicle requirements for the assigned functionalities, specification, lead the development of the electrical powertrain unit and vehicle integration. MEC will support CTC in optimization of the electronic interfaces for managing battery cells balancing, on-board charger enabling and control and the electronic board for converting vehicle communication protocol to the stand-alone charging station included modelling of appropriate algorithms for estimating the battery cells critical parameters; moreover, MEC lead the definition of testing lists, protocols and standards and will support IREN in the integration of the e-vehicles and related components into the two pilots for testing. Finally, will support CTC in the analysis of results and techno-economic assessment.

AAU

Aalborg University is organized in five faculties of humanities, engineering and science, medicine, social science, and IT and design. According to US News World Ranking, Aalborg University ranks as no. 260 in the overall world university rankings and as no. 4 in the world, and best in Europe, within the field of Engineering.

The Department of Energy Technology, Faculty of Engineering and Science, Aalborg University, operates with energy technologies and solutions with focus on sustainable energy, thus largely contributing to future energy and climate challenges. The department was founded in 1987 and is located in Aalborg and Esbjerg, Denmark. Each campus offers both research and education.

The department's mission is to teach and carry out research at the highest level within the field of energy engineering in order to produce new knowledge and candidates for the benefit of both companies and Danish society. We produce graduates at Bachelor, Master and PhD levels at an internationally recognized standard. Research and results are characterized by a comprehensive collaboration with both national and international companies and universities.

Role played in the project

In V2G project, AAU will mainly perform test and characterization of the battery cells of the prototype vehicle of the V2G-project and develop algorithms for battery state estimation, e.g. state-of-charge (SoC) and state-of-health (SoH) estimation. The battery cells will be tested in the Battery System Tests Laboratory of AAU, which includes state-of-the-art equipment for electrical, thermal, and lifetime testing and characterization of batteries. Based on the tests, models and algorithms for battery state estimation will be developed. AAU will also participate together with all partners regarding integration of components into the pilots and subsequent testing and optimization of the V2G solutions.

PARTNERS

IREN

www.gruppoiren.it

MECAPROM

www.mecaprom.com

AALBORG UNIVERSITET

www.aau.dk

Cartech Company

www.cartech-company.com

KEEP INFORMED

If you want to learn more about the V2G project, please visit the V2G website or follow the project on Twitter and LinkedIn.
To get in touch with one of the V2G partners:

www.evolution2grid.eu

twitter.com/eVolutiontoGrid

info@evolution2grid.eu

www.linkedin.com/in/eVolutiontoGrid

The V2G website will be available soon and you will find there further communication and dissemination materials.

If you like our content subscribe to our newsletter and like, follow and share our social media accounts and posts to get the most recent news on events and results.

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For more info about the project visit the V2G website at:
www.evolution2grid.eu