



a project designed to accelerate the deployment of electric vehicles

Paris, September 18, 2014 –. The Eco2charge project aims at supporting the development of electric vehicles (EV) by accelerating the deployment of EV charging infrastructures in buildings, campuses and eco-districts by the end of 2016. These facilities will thus complement roadside charging stations and enable users to charge their EV's at their workplace, in their neighbourhood or at public or private charging points (at railway stations, supermarkets, public parking areas, etc.). The project is coordinated by Bouygues Energies & Services and brings together the expertise of eight partners from various industries, including Actility, Alstom, Bouygues Energies & Services, CEA (French Alternative Energies and Atomic Energy Commission), Embix, Nexans, Renault, and the University of Versailles Saint-Quentin-en-Yvelines (UVSQ).

Eco2charge also aims at developing and marketing the components of the solution within three years. The project, with a budget of 13.2 million euros, is implemented with the support of the "Vehicle of the future" programme. "Vehicle of the future" is part of the "Investment for the Future" Programme (*Programme des Investissements d'Avenir*, or PIA) run by ADEME (French Agency for Environment and Energy Control) on behalf of the French government.



Eco2charge fits in all respects with the objectives of the Energy Transition government bill, currently under discussion in the French parliament. This project focuses on energy efficiency through smart energy management, the ease of deployment of electric vehicles, the development of a circular economy based on second-life batteries, and the integration of local renewable energy generation.

The project's distinctive goals include:

- Meeting the expectations of both EV users and building owners in order to create an easy-to-use system providing a high level of service and making users increasingly confident
- Integrating charging infrastructures into the overall power management system of a building, campus or eco-district, so as to limit electricity subscription costs as well as peak loads on the national grid
- Designing innovative solutions to minimize investment costs

A collaborative innovation to turn locations equipped with EV charging facilities into full-fledged energy ecosystems

This collaborative innovation, coordinated by Bouygues Energies & Services, aims at turning locations equipped with EV charging facilities into full-fledged energy ecosystems in which power generation, storage and consumption constantly balance each other.

The system thus enables interaction between all components involved in energy management for a building. Smart energy management on premises is achieved by combining the following aspects:

- Various power supply sources, whether local (renewable energy) or external
- Power storage capacity
- Needs of the building and its occupants
- Disparate expectations of EV drivers

The objective is to provide users with the best EV charging service possible, while limiting the costs and energy impact of the building. Eco2charge project aims at demonstrating the relevance of this “SMART GRIDS” local loop for industrial and office buildings. At the same time, it can be directly transposed to an eco-district mesh.

What challenges does Eco2charge meet?

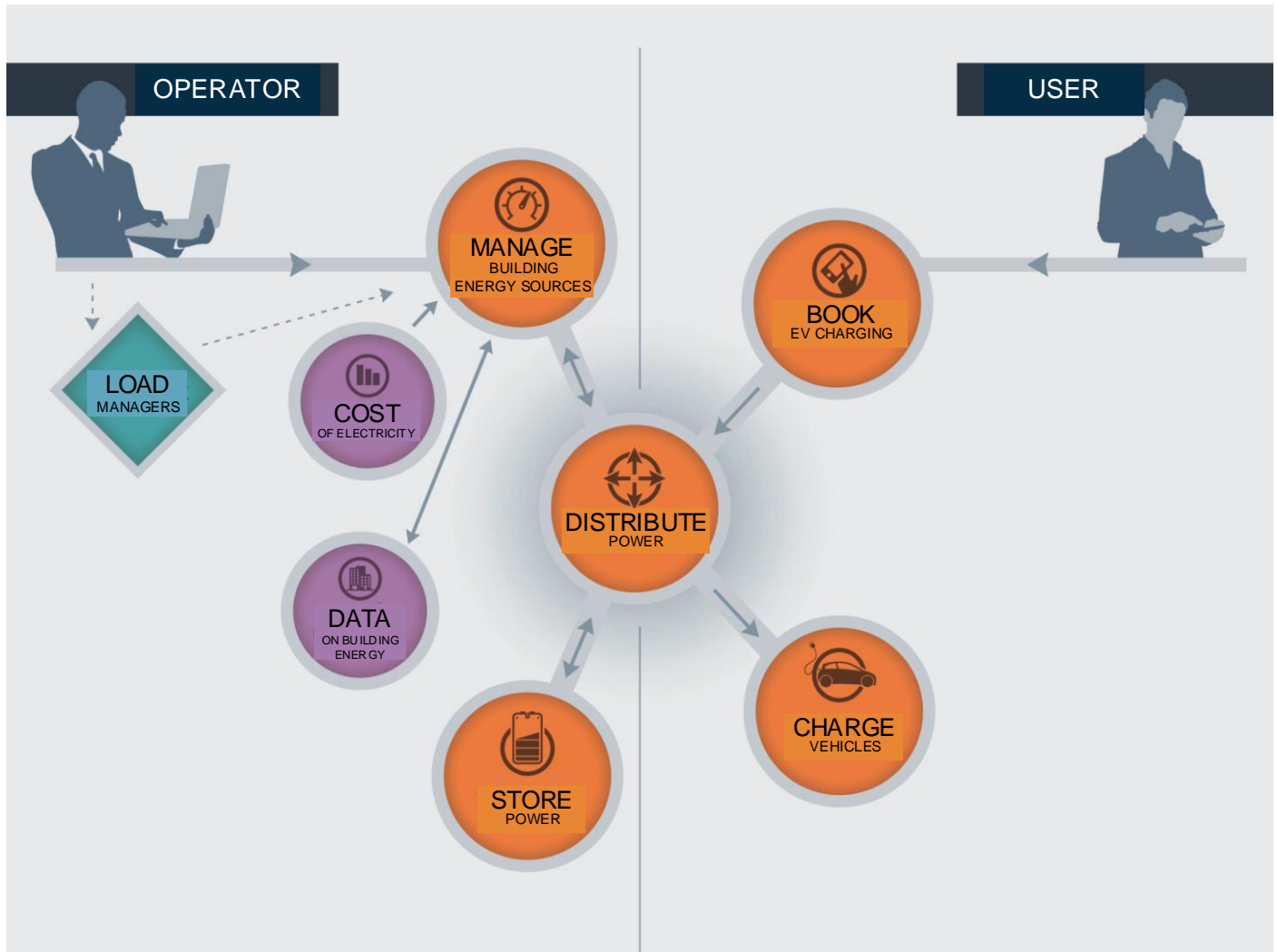
- **Usage challenge** – The number of currently available EV charging stations and the conditions of use are not adequate to make drivers confident.
- **Financial challenge** – How to make the installation of charging stations easy and affordable to encourage investment?
- **Energy challenge** – The standard charging of an electric vehicle consumes about 3.7kW in 4 hours. The full and simultaneous charging of 100 EV's would require doubling the total power capacity of an office or commercial building (to 670kW instead of 300kW for a building with 600-1,000 occupants), thus entailing a more expensive subscription cost and a high impact on the electrical grid, only for 2-3 hours a day.

Eco2charge's answers

To meet these challenges, the Eco2charge project will allow the following:

- Ensuring a high level of service for EV users and building/eco-district operators.
- Minimizing infrastructure and electricity costs through:
 - The use of an innovative solution for local power storage
 - The modular deployment of smart charging facilities (using a connection solution that can be gradually extended without any civil engineering work)
 - Smart energy management for power consumption smoothing based on economic interest, grid stability requirements and, especially, users' needs
- Reducing the environmental footprint of a building by promoting:
 - The transition towards electric vehicles
 - The development of self-consumption
 - A circular economy in which EV batteries are reused to store power

Eco2charge infrastructure



Focus on 3 key points

- **Smart energy distribution** to regulate usage and avoid peak loads and oversizing of the electric infrastructure of the building. The project will offer a solution of charging stations' management to allow the EVs to be charged at various times of day depending on users' needs (times of arrival and departure, charge level on arrival and required charge level for departure based on the distance to be travelled...). This solution will also be consistent with the overall energy management of the building (including power generation and consumption). The smart charging stations will in fact be connected to a central control system designed for overall energy optimisation in a building, in conjunction with local power consumption and renewable energy generation.
- **The development of a local energy storage system reusing "second-life" batteries** after their primary use in an electric vehicle. In addition to the environmental value of extending battery use, this solution offers the advantage of leveraging advances in the automotive industry to make such systems affordable.
- **The design of a smart and scalable charging station system** to ensure access to all types of electric vehicles. This solution is extensible thanks to a modular architecture which allows more charging stations to be added cost-effectively, without any additional civil engineering work.

Furthermore, the collected **usage data** will allow the adjustment of EV charging modes and the development of new service offerings for users (including creation of customer accounts, information and booking, billing, etc.), in order to facilitate the adoption of electric vehicles through ease of use and confidence in charging systems.

Experiments in two office buildings in Yvelines

An Eco2charge project demonstrator will be implemented in two major office buildings near Saint-Quentin-en-Yvelines: Renault's Technocenter and Bouygues Construction's Challenger headquarters.

New job opportunities

The development of EV charging facilities and the emergence of industrial and service markets will generate new job opportunities and service activities as a result of this need (including on-premises and multi-site energy management, storage flexibility management, EV charging station fleet management, power storage system operation and maintenance, etc.).

Learn more at www.eco2charge.com

About Actility

As part of the Eco2charge project, Actility brings its expertise in the field of smart energy distribution. In order to minimize infrastructure costs when deploying EV charging stations, Actility offers solutions for measuring and analysing load demand in relation to the grid capacities. Within the Eco2charge framework, this analysis allows the power grid to be optimally sized. Actility simulates the operation of the grid which supplies each station with power, enabling grid managers to detect any under-capacity in the distribution grid and assess any civil engineering work required. Actility also helps identify users, the various types of EV charging as well as the corresponding billing modes.

Actility is an industry leader in Machine to Machine (M2M) large-scale infrastructure with ThingPark®, the next-generation standard-based M2M communication platform and ThingPark Wireless, the long range low-power wireless network for the Internet of Things (IoT). Actility also provides Smart-Grid services around demand optimization and management, including Demand Response, Load Shifting and large-scale Admission Control for electric vehicle (EV) charging infrastructures.

For further information, please contact communication@actility.com

About Alstom Grid

Within the Eco2charge framework, Alstom Grid brings its expertise in the field of distributed energy resources management and optimisation (production, storage, use) for a smarter grid. Alstom Grid has one clear vision: to develop innovative solutions for a flexible, reliable, affordable and sustainable electrical grid, everywhere. We design, manufacture, install and service the power transmission and distribution products and systems that empower the planet's low-carbon economy. for now and for the future.

Alstom Grid has over 130 years' experience and ranks among the top three in the electrical transmission sector with an annual sales turnover of €3.8 billion. Alstom Grid's 17,000 employees are spread across 87 manufacturing and engineering sites worldwide and have one common mission: be our customers' trusted partner, from the source to the city. We are energising a smarter world... with Alstom.

Alstom is a global leader in the world of power generation, power transmission and rail infrastructure and sets the benchmark for innovative and environmentally friendly technologies. Alstom builds the fastest train and the highest capacity automated metro in the world, provides turnkey integrated power plant solutions and associated services for a wide variety of energy sources, including hydro, nuclear, gas, coal and wind, and it offers a wide range of solutions for power transmission, with a focus on smart grids. The Group employs 93,000 people in around 100 countries. It had sales of over €20 billion and booked €21.5 billion in orders in 2013/14.

About Bouygues Energies & Services

Bouygues Energies & Services coordinates the Eco2charge project, bringing in particular its experience in designing and operating office and commercial buildings and electric infrastructures. Bouygues Energies & Services also take an active part in the development of the battery second-life component and provides one of the two test buildings for the project demonstrator.

Bouygues Energies & Services designs, installs, maintains and operates technical systems (power grid infrastructures, digital infrastructures, electric and thermal engineering, public lighting, etc.) and field services (facility management, industrial maintenance, urban services, etc.). Bouygues Energies & Services is committed to future-proofing its technical solutions and the performance of its services for the sustainable quality improvement of people's living and working environment. Bouygues Energies & Services supports public and private customers in the fields of energy, manufacturing, services, transportation and telecommunications.

Both in France and abroad, Bouygues Energies & Services relies on the expertise, commitment and responsiveness of its 12,000 employees to offer innovative, high value-added technological solutions to its customers. With 200 locations in France and a presence in over 20 countries worldwide, Bouygues Energies & Services generated sales of €1.6 billion in 2012.*

**contributing €1.5 billion to Bouygues Construction's turnover.*

Website: www.bouyguesenergieservices.com

About CEA

In the frame of the Eco2charge project, CEA is responsible for the definition and development of the energy management algorithms, in collaboration with the project partners who integrate these algorithms into their equipment. CEA develops energy management algorithms at different levels:

- at the campus level, for the energy management of the whole campus, and the optimization of the economic profits related to flexibility offered to electricity markets. These algorithms are optimization algorithms which are then deployed to the campus energy management system;*
- at the EV charging station level, for the power and energy management of EV charging. These algorithms are both optimization algorithms for EV charge planning, and real-time control algorithms deployed in local controllers.*

CEA (French Alternative Energies and Atomic Energy Commission) is a public research organisation operating in four main areas: low-carbon energy, information and healthcare technologies, management of massive experimental research facilities (TGIR), and defence and global security. With 16,000 researchers and employees, CEA plays a leading role in the European research community and its international presence is constantly growing. Within the Technological Research Division, two institutes, LITEN and LIST, contribute to the development of smart energy technologies.

LITEN (Laboratory for Innovation in New Energy Technologies and Nanomaterials) focuses on developing new energy technologies (such as solar energy, biomass, technologies for electric and hybrid vehicles, applications for hydrogen, energy storage, independent energy), ranging from the design of new materials and processes to the manufacturing and functional testing of prototypes. Research activities related to solar energy are carried out at the National Solar Energy Institute (INES), which is the French centre of reference in the field of solar power, based in Bourget du Lac.

LIST (Laboratory for Integration of Systems and Technologies) is a technological research institute which focuses on smart digital systems. R&D programs carried out at LIST are related to major economic and social issues, and are dedicated to interactive systems (ambient intelligence), embedded systems (architecture, system and software engineering), sensors and signal processing (industry control, healthcare, security, metrology). LIST is located on the Saclay Plateau in Ile de France close to Paris, and its main academic partners are part of the Digiteo network and "Association des Instituts Carnot". Regarding technological transfer to industrial partners, the projects carried out at LIST are managed in the frame of industrial partnerships and competitiveness clusters, such Systematic Paris-Région.

About EMBIX

As part of the Eco2charge project, EMBIX brings its expertise in the field of Smart Grids to optimise energy flows (production, consumption and storage) within the two experimentation sites: Renault's Technocenter and Bouygues Construction's Challenger headquarters.

EMBIX offers a wide range of services with high added value, around two main activities: Consulting services & software development.

Smart Grids & Smart City Consulting – Through its Smart Grids & Smart City Consulting division, EMBIX provides consultancy services and works together with its partners (local authorities, city council, urban planners) to design and build Smart Grids and Smart Cities projects.

Software development – EMBIX develops a software solution intended to provide energy management services for eco-districts, featuring the latest advances in Smart Grids technologies.

EMBIX is designing the energy management system, a cloud-based platform integrating real time data (energy data, users needs, demand-response needs, etc.) to manage energy flows more efficiently within the neighbourhood.

Website: www.embix.fr

About Nexans

Nexans is involved in the Eco2charge project through its Smart Grids Competence Centre, Nexans Power Accessories France, based in Ardennes.

Leveraging its expertise in connection equipment, Nexans develops a smart and modular connection and charging infrastructure solution which can interoperate with the systems designed by other Eco2charge partners.

Nexans brings energy to life through an extensive range of cables and cabling solutions that deliver increased performance for our customers worldwide. Nexans' teams are committed to a partnership approach that supports customers in four main business areas: Power transmission and distribution (submarine and land), Energy resources (Oil & Gas, Mining and Renewables), Transportation (Road, Rail, Air, Sea) and Building (Commercial, Residential and Data Centres). Nexans' strategy is founded on continuous innovation in products, solutions and services, employee development, customer training and the introduction of safe, low -environmental- impact industrial processes. In 2013, Nexans became the first cable player to create a Foundation to introduce sustained initiatives for access to energy for disadvantaged communities worldwide.

We have an industrial presence in 40 countries and commercial activities worldwide, employing close to 26,000 people and generating sales in 2013 of nearly 6.7 billion euros.

Website: www.nexans.com

About Renault

Renault will bring the Eco2charge project and its partners its own expertise and know-how in the fields of electric vehicles and Li-ion batteries which equip its vehicles but can also be used off-board in stationary mode (Renault takes an active part in the development of this activity within the project).

The Renault Group is active in 118 countries and designs, develops, manufactures and markets passenger cars and light commercial vehicles under three different brands: Renault, Dacia and Renault Samsung Motors. To rise to the new environmental and economic challenges faced by today's automobile industry, Renault focuses on two priorities: improving existing technologies through new-generation engines featuring low CO2 emissions and its ground-breaking 'Zero Emission' programme. Renault introduced its 'Zero Emission' range with Fluence Z.E. and Kangoo Z.E. in 2011, followed in 2012 by Twizy, an innovative urban quadricycle, and ZOE in 2013. Together, these vehicles form a range which makes innovation a reality for ordinary motorists. Through its partnership with Nissan, Renault aims to become the global leader in mass marketed zero-emission vehicles.

Website: www.media.renault.com

About the University of Versailles Saint-Quentin-en-Yvelines (USVQ)

As part of the Eco2charge project, the research laboratory in ecological economics, eco-innovation and sustainable development engineering (REEDS) will bring its sociological competencies in order to analyse the users' implicit and explicit expectations about charging infrastructures.

With more than 19,000 students, UVSQ offers an elite multidisciplinary training programme through its 33 international labs.

Involved in a number of "Investment for the Future" projects (including IdEx Paris-Saclay, LabEx, IHU, EquipEx, cohortes, IRT, and IEED), our labs are unique in their ability to establish bridges between various research fields. They conduct state-of-the-art research in several innovative fields such as Materials Sciences, Patrimony Sciences, Cryptography, Sustainable Development, Climate & Environment and Innovation Management.

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