

SUSTAINABLE MOBILITY INSTITUTE: A SHARED PLATFORM THAT HAS WORKED TO CO-BUILD THE FUTURE OF MOBILITY IN THE LAST FIVE YEARS

Renault, the Renault Foundation and ParisTech celebrated the fifth birthday of the Sustainable Mobility Institute on November 27th, 2014.

Renault, the Renault Foundation and ParisTech decided in 2009 to create a multi-disciplinary platform to co-lead research work on the future of transport and mobility solutions.

The aim of the platform is to carry out academic analysis and test innovative solutions while ensuring real-life outlets for innovations and their wide-scale rollout potential. The overarching goal is to meet the global challenges currently facing carmakers, including global warming, ecosystem re-organization adapted to electric mobility, growing urbanization and the corresponding traffic congestion problems, and the conditions for success for new mobility solutions.

By harnessing the skills of academia and operational players in mobility, the platform seeks to support and further understanding on the transition phase towards electric mobility and enlighten decision-making.

Collaborative work between Renault engineers and ParisTech professor/researchers and students was initiated primarily to:

- **foster research on the design of innovative mobility systems, particularly those based on electric vehicles;**
- **train top-level managers and scientists with the skills required to address the needs of transport-sector manufacturers and the scientific and technological challenges involved in the long-term development of sustainable transport systems.**

Over the years, the Sustainable Mobility Institute has opened up to other French and international academic and industrial partners seeking to contribute to the work.

The Sustainable Mobility Institute has over the last five years coordinated research programs and developed training in four main areas, involving ten ParisTech research laboratories and seven schools:

- **“Electric Mobility System”:** to more fully understand the interactions between the mass circulation of electric vehicles, territories, the social and economic aspects of households in those territories, and infrastructure needs.
- **“Business model”:** to gain more understanding on the economic and organizational issues of electric vehicles (EVs) for each player in the ecosystem on the basis of field tests, with a view to identifying the drivers that will speed their adoption.
- **“Global vision”:** to objectively appraise the impact of new global and structural trends on Renault (environment, energy, raw materials and new industrial ecosystems) using strategic analysis tools and economic modelling.

- **“Technologies”**: to carry out upstream work on disruptive technologies to further advances in battery technologies (increasing energy density to increase EV range) as well as work on reducing mass.

Five years' work for future mobility: a few examples.

“Electric mobility system”

- **A study of the behavior of communities in reaction to innovations in mobility services. How to take account of the desire of communities to play a part in defining and designing these services so as to better appropriate them? The emergence of web communities interacting on environmental, automotive and EV topics is an example of this trend.**
- **A study of the capacity of information technologies in India to assemble the discontinuous resources for access to electricity and the way basic players are organizing to link up micro-grid components so as to offset the random distribution of electricity. A full 40% of Indian households have no access to electricity (2008). Isolated ecosystems with high levels of autonomy and development are being formed, paving the way for EVs to naturally gain a foothold in neighborhoods and activity areas with a strong focus on renewable resource solutions.**

“Business Model”

- **The characterization of a new “implementation engineering” for electric vehicles, which, in addition to product development, is able to handle the design of the corresponding electric mobility system.**
- **Quantification of the contribution of taxi fleets and car sharing services to EV development through their prescriptive impact.**
- **The development of tools to assess the electrification potential of cities, regions and countries and the identification of the priority drivers for stepping up the development of EVs.**
- **Two laboratories involved: CRG École Polytechnique and SES Télécom ParisTech.**
- **Team: three senior researchers and three doctoral students.**
- **Publications: two books, six scientific articles, six chapters in collective works, fourteen participations in conferences and speakers invited.**

“Global vision”

- **Analysis of the macro-economic and environmental benefits of the electric vehicle population [Revue de l’Energie, 611 (2013)].**
- **Impact of the inertia in the development and distribution of a new automotive technology on the marginal abatement cost of CO2.**
- **Macro-economic and energy contexts of the emergence of EVs in Europe and China. Analysis of China and EV market.**

Some figures:

- **3 thesis papers**
- **15 scientific publications (including an article awarded by the French Association of Energy Economists and several articles published as Working Papers by the World**

Bank)

- 7 talks at international conferences.

“Technologies”

- **Work on the shaping of materials such as silicon, state-of-the-art “challengers” (graphite) and strategies for increasing their lifespan (through the use of additives).**
- **Prospective research on compounds with the potential to be used at higher voltage, the energy of an element being directly proportional.**
- **3 patents.**
- **Scientific community: 8 publications (peer-reviewed journals) and 25 conference participations.**
- **8 theses defended, in process or at post-doctoral level.**
- **A minimum 20 researchers and six laboratories involved.**

In 2010 the Sustainable Mobility Institute created a “Mobility and Electric Vehicles” Masters in which young engineers are trained on the design, production and recycling of electric vehicle. Some 65 students from 16 countries with grants from the Renault Foundation have already benefitted from the program.

Thierry Bolloré, Member of the Executive Committee, Executive Vice President, Chief Competitive Officer of the Renault group: *“The Sustainable Mobility Institute upholds a global approach conducive to preparing for technological disruptions, changes in use and the economic impact of those changes. The platform enables us to go beyond the objects in themselves to take better account of geopolitical influences and the speed with which new mobilities are accepted in different markets. It brings us a firmer grasp of all the complexity of this major transition, which will impact everyday life in urban and rural environments.”*

About [Renault](#)

The Renault group has been making cars since 1898. Today it is an international multi-brand group, selling more than 2.6 million vehicles in 128 countries in 2013, with 37 manufacturing sites, and employing nearly 122,000 people. To meet the major technological challenges of the future and continue its strategy of profitable growth, the Group is harnessing its international development and the complementary fit of its three brands, Renault, Dacia and Renault Samsung Motors, together with electric vehicles, the Alliance with Nissan, and its partnerships with AVTOVAZ, Daimler and Mitsubishi. With 12 world championship titles in 36 years, Renault’s expertise in Formula 1 is equally remarkable, as a vector of innovation, image and awareness.

About the [Renault Corporate Foundation](#)

The Renault Corporate Foundation, founded in 2001, expresses Renault’s real-life commitment to further education. The role of the Foundation is to create lasting ties between business and academia in France and internationally by designing and backing original training programs in multicultural management and sustainable mobility. The Renault Foundation also endeavors to spot talented individuals destined to take the helm at major global groups in the future, thereby creating, together with the Foundation’s best partner universities around the world, a unique network of over 650 professionals enhanced every year with some 80 new students.

About [ParisTech](#)

ParisTech is a consortium of prestigious higher education institutions that work together on joint training, research and innovation projects in the fields of science, technology and management.

ParisTech, short for Institut des Sciences et Technologies de Paris, was established as a public scientific cooperation organization (EPCS) in 2007.

The ParisTech brand is based on two cornerstones: French further education as exemplified by the Grandes Écoles and a multi-disciplinary approach at the service of business. Paris Tech comprises 12 member schools and enjoys strong interaction at international level through numerous partnership agreements.

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