EDF

SPARKS INNOVATION

EDF PULSE AWARDS 2015

PRESS KIT

APRIL 2015

EDF launched the EDF Pulse Awards to promote innovation and be actively involved in tomorrow's future. It has set a goal for itself: to showcase and provide tangible support to initiatives and projects that unleash electricity's tremendous potential and help advance the world around us.

On the heels of the success of the first edition in 2014, EDF remains as committed as ever this year with EDF Pulse 2015 to spotlight and foster innovative projects, start-ups, scientists and researchers, all joining forces together to create and invent today the world of tomorrow.

Following a challenging and rigorous selection process, the second edition of EDF Pulse is now heading into a decisive phase: on 10 March 2015 six highly innovative and promising projects were short-listed by a jury. It is now in the hands of the general public to voice its opinion and vote.

EDF is encouraging the on-line community to cast their votes by logging on to its website www.pulse.edf.com from 7 April to 3 May 2015. On-line users can choose their favourite project from each of the three distinct categories: Smart Living & Electricity, Health & Electricity, Science & Electricity.

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EDF Group, one of the leaders in the European energy market, is an integrated energy company active in all areas of the business: generation, transmission, distribution, energy supply and trading. The Group is the leading electricity producer in Europe. In France, it has mainly nuclear and hydropower generation facilities where 97.6% of the electricity output is CO2-free. EDF's transmission and distribution subsidiaries in France operate 1,285,000 km of low and medium voltage overhead and underground electricity lines and around 100,000 km of high and very high voltage networks. The Group is involved in supplying energy and services to approximately 37.8 million customers, of which 28.3 million in France. The Group generated consolidated sales of €72.9 billion in 2014, of which 45.2% outside of France. EDF is listed on the Paris Stock Exchange and is a member of the CAC 40 index.

EDF PULSE AWARDS 2015 EDITION

THREE AWARD CATEGORIES REWARDING INNOVATION

In 2015, three EDF Pulse awards will honour electricity-related projects and innovations developed by start-ups and research laboratories based in Europe. There will be one winner from each distinct category:

- **Smart Living and Electricity:** projects related to housing, mobility, urban planning, sustainable cities/towns, etc.

- **Health and Electricity:** innovations related to improving health and boosting overall well-being both individually and collectively (smart medicine, connected health care, etc.)

- **Science and Electricity:** energy-storage related research and projects

The EDF Pulse Awards provide the winners with tangible and operational support: a financial grant as well as EDF's assistance in heightening their visibility and publicizing their projects (mass media campaign). This combined support will drive the development of the project and spark the interest of investors, customers and partners.

MORE THAN 200 PROJECTS SUBMITTED

From September to November 2014, **more than 200 start-ups and research laboratories submitted applications in the hopes gaining attention for their projects.**

To encourage candidates to submit applications and identify potential projects, EDF called upon the assistance and expertise of:

- **the EDF R&D teams** such as its scientific department, the experts in energy storage and the Open Innovation team, which is specialised in spotting out and providing guidance to the most innovative start-ups in the energy sector,
- **Electranova Capital, EDF and ID Invest's investment** fund dedicated to providing financial support to innovative high techs in the new energy and environmental sectors,
- **Faber Novel, a consulting agency specialised in innovation.**

Networking with the incubators of the top-ranking universities also helped in picking out promising projects via certain innovation platforms such as at Saclay, Lyon/Grenoble and foreign universities: Imperial College (UK), the University of Manchester (UK), Politecnico di Milano (Italy) and the University of Krakow (Poland).

The first phase of the selection process was held in December 2014. After reviewing all of the applications, 100 projects were selected with a breakdown of 55 French projects and 45 European ones.

6 FINALIST PROJECTS SHORT LISTED

On March 10, 2015, a jury, chaired by Bernard Salha, EDF Group Research & Development Director with distinguished members from both within and outside of EDF, selected the six finalist teams (two for each Award category).

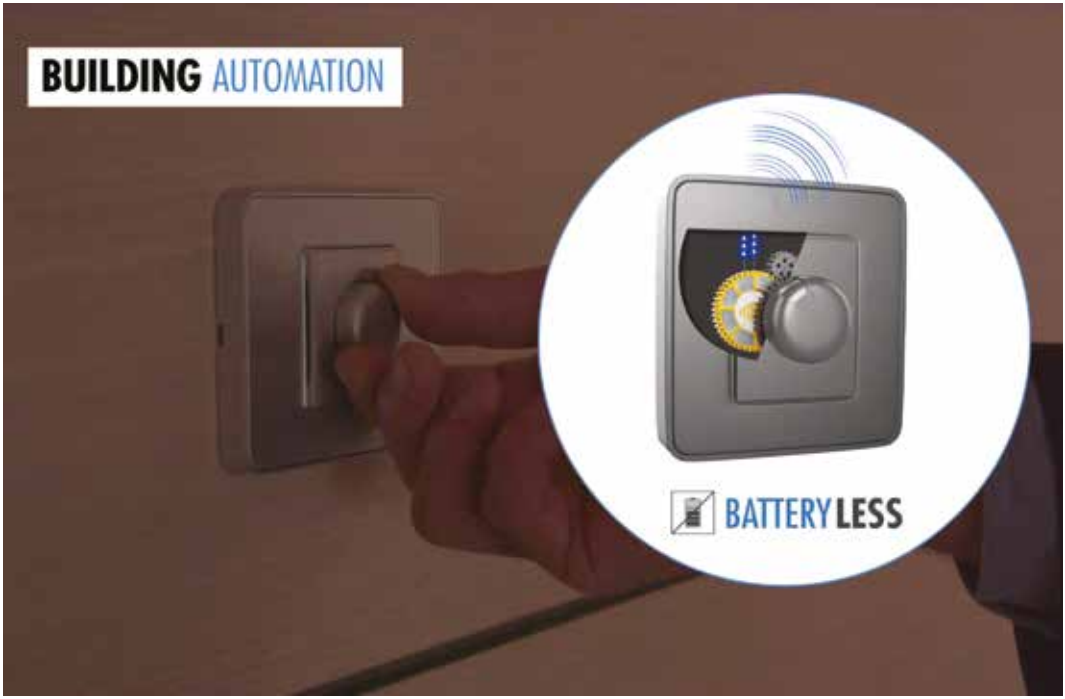
Jury members:

- **Robert Armstrong,** Director of the MIT Energy Initiative (USA)
- **Bruno Bonnell,** Director of Robopolis, a French company specialised in personal robotics
- **Francesca Gulminelli,** Scientist and member of the Institut Universitaire de France
- **Claudie Haigneré,** Scientist and astronaut, Chairwoman of Universcience
- **Nick Leeder,** Managing Director of Google France
- **Thomas Guillochon,** Development Director of HelloAsso, a crowdfunding platform dedicated to the French non-profit sector
- **Dominique Marrec,** Partner at the ECDM architect firm
- **Bertin Nahum,** CEO and founder of Medtech, company specialised in designing and developing new-generation surgical robots
- **Laure Reinhart,** Director of partnerships and innovative systems at BPI France
- **Pascale Santi,** Science journalist for «Le Monde»

The EDF Pulse Awards is now embarking on the final phase with the on-line community vote taking place from **7 April to 3 May** (www.pulse.edf.com). The winners will be announced during the Awards Ceremony to be held on 4 June 2015 and presided over by Jean-Bernard Lévy, Chairman and CEO of the EDF Group.

THE
6 FINALISTS

SMART LIVING



ENERBEE

The French start-up EnerBee has developed an energy generator that both produces and stores energy by using detected movements. By combining piezoelectricity and magnetism, the EnerBee system transforms slight movements at nearly any speed into energy with amplitude ranging from a few millimetres to one centimetre.

The long-term aim is to replace batteries in smart devices used for widely diverse purposes. All small and medium-sized electronic devices can benefit from this technology: smart watches and wristbands, locks and switches as well as parking remote controls, smart automotive sensors, etc.

In addition to generating and storing energy, the EnerBee sensors also use the self-generated energy to transmit data remotely without using a battery or cable.

The 10-member EnerBee team is specialised in electrical engineering, energy, exploitation of innovation and product development. The system is based on the research and patents developed by laboratories and research institutes in Grenoble, France.

A pilot series is currently being tested out and the marketing phase is scheduled for end-2016. With such promising prospects, the start-up raised M€2,6 to finance the necessary capital expenditures and commission the industrial manufacturing of its products.

SMART LIVING

TWIDO

The company 2&GO has developed a connected, modular water heater powered by solar energy and electricity to help people use hot water and energy more responsibly.

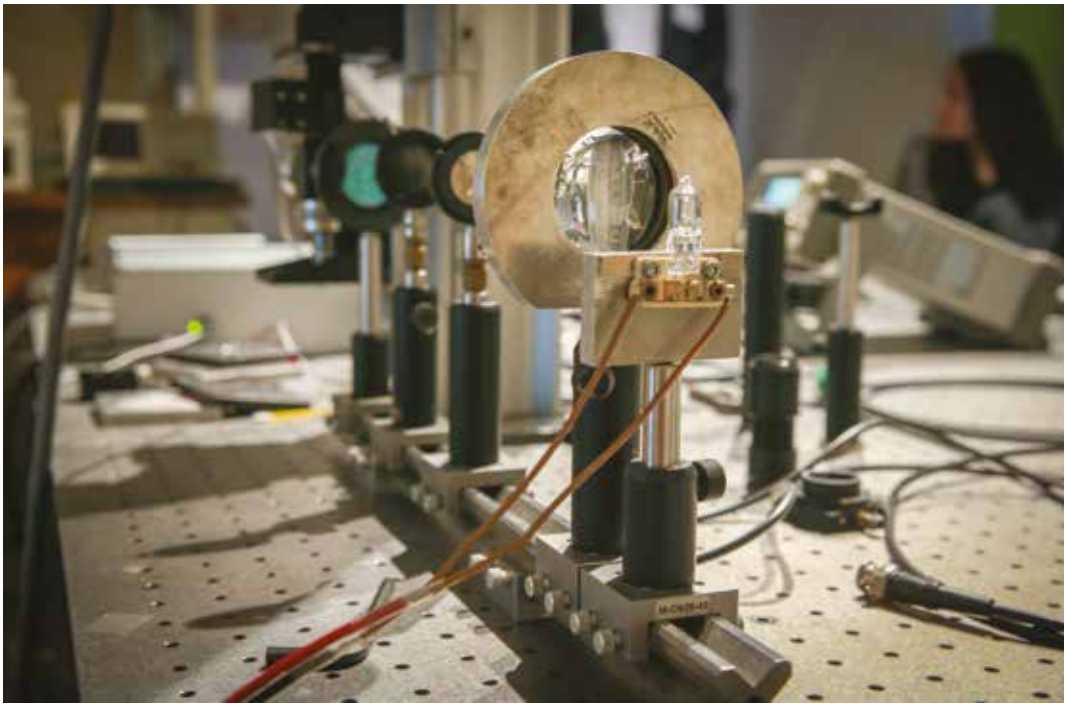
Users can accurately control their energy consumption by using an on-board computer system. The water heater is fitted with a WI-Fi connection and on-board computer system to transmit and receive data via a dedicated Internet application. Its features help you simulate your consumption, provide a monthly energy consumption overview, determine your optimal water volume, plan your water consumption and trigger an email alert in the event of overconsumption or insufficient water supply, etc.

It also boasts an embedded machine learning module that automatically adapts the daily amount of heated water in relation to household consumption habits.

In addition to the energy savings, Twido is also space saving giving you an extra 1m2 of floor space in the bathroom. It is designed using green and recyclable materials and its tank is extremely long-lasting compared to conventional water heaters.

2&GO has entered into a scientific and technical partnership with the French CEA (Alternative Energies and Atomic Energy Commission) in Cadarache. Various models are currently available for sale and 2&GO is seeking to step up even further its development.

HEALTH



DAMAE MEDICAL

DAMAE Medical has developed a new device to analyse different types of skin cancer using a non-invasive imaging solution.

The device carries out real-time diagnoses of malignant tumours through simple contact with the surface of the skin. It also avoids the patient having to undergo an invasive procedure leaving scars while significantly reducing the turnaround time for results.

Dermatologists will now be able to conduct an in-depth skin analysis and detect potentially cancerous cells, using an optical biopsy that works through simple contact with the skin. DAMAE Medical's imaging is twice as accurate as the current technology, thereby simplifying medical procedures in the event of a tumour.

DAMAE Medical has partnered with Institut d'Optique, the CNRS (National Scientific Research Council) and Hôpital Saint-Louis (Paris), which will conduct the pre-clinical and clinical trials for the device.

After the clinical trials, the pre-manufacturing phase and the CE certification process will be launched. DAMAE Medical received an award in 2014 in the Worldwide Innovation Challenge in the personalised medicine category.

HEALTH

NEURONAUTE

The company Bioserenity has developed a line of smart garments that can carry out electro-physiological measurements for neurology. The primary application of this garment is to speed up the diagnosis for epilepsy and carry out the relevant measurements necessary to treat this disease.

Currently, the diagnosis for epilepsy often takes as long as two to three years and is cost-consuming. As testing is conducted over a short period of time in specialized facilities, it is quite rare to observe an epileptic seizure as it is happening. Neuronaute clothing was therefore designed to considerably streamline and optimise diagnosis while safeguarding the patient's comfort.

The hat and T-shirt are smart networked garments that carry out electro-physiological tests in real time, take measurements by collecting physiological parameters and store them in the Cloud via a smartphone. Patients wear the clothing at home for several days in order to find out what is really causing the seizures with diagnosis being made in just a few weeks. As the treating practitioners can consult patients' data at any time, they have a reliable and regularly updated basis on which to make an accurate diagnosis. They can also analyse any reactions to treatment and alter dosage in real time.

This project, led by a 14-member cross-disciplinary team, is currently in the working prototype phase. Testing was conducted at the French Brain and Spinal Institute at the Hôpital de la Pitié-Salpêtrière (Paris). The CE certification process is also under way.

SCIENCE

REVERSIBLE ELECTROLYSIS

As electricity produced from renewable sources is dependent on weather conditions, its production is therefore sporadic. As a result, it requires efficient storage solutions to «absorb» the surplus energy at certain periods to be used at a later time when the weather is less favourable or during a peak. The German company Sunfire has found a solution for this dilemma with its highly-innovative energy storage solution based on a reversible electrolysis system.

The surplus electricity generated from renewable sources is first stored and converted to hydrogen using the Sunfire system operating as an electrolyser. This hydrogen can be used as a chemical energy vector, for example as raw material combined with carbon dioxide to create a clean fuel or as an energy source for a «hydrogen» car. In this case, the hydrogen powers a fuel cell that provides electricity to the engine. The system can also run on gas or hydrogen to produce electricity and to heat homes. Sunfire is therefore offering a reversible system converting electricity into clean fuel and producing energy from it all at the same time.

The Sunfire team has over 70 engineers, technicians and project managers, all of whom are experts in their respective fields. The company has filed 30 separate patent applications for its reversible electrolysis process. The product marketing phase has been scheduled for the near future.

SCIENCE

VOSS

The French company Energiestro has developed both a highly-performing and cost-efficient energy storage solution using flywheels made from pre-stressed concrete. The use of pre-stressed concrete, a highly performing yet low cost material, sets the VOSS flywheel apart from conventional ones that use materials like steel or carbon fibres, making their upfront and usage costs too high.

Energiestro has developed a one-of-a-kind procedure combing the seemingly incompatible pair of a wheel and concrete: the wheel operates only in tension and the concrete resists only on compression. The device casts the concrete in the conventional manner and then compresses it heavily such that when it is spinning fast the concrete is still under compression. It is therefore possible to rotate the concrete at very high speeds without it going in tension in order to store large quantities of energy at a cost ten times less than current flywheels.

The VOSS project simultaneously offers reduced costs and extended product life cycles. Its efficiency is 80% upon conversion. It greatly reduces the potential expense of storing electricity and makes using intermittent renewable energies more appealing by offering a low-cost and accessible solution.

The VOSS project boasts six filed patents and was the winner of the World Innovation Competition in March 2014. The team expects to market its invention in the upcoming year or two. Several prototypes are currently being deployed and tested at pilot sites.

YEAR-IN-REVIEW OF THE FIRST EDITION OF THE EDF PULSE AWARDS

EDF Pulse awards 2015 edition

SIX WINNERS

In its first edition, EDF awarded prizes to six electricity-related projects thanks to the support and votes cast by over 260,000 on-line users.

- **Hybrid Lighting System – Echy,** a lighting system recovering natural sunlight and transporting it to light the indoors by using fibre-optic cables
- **Wandercraft,** the company that invented the robotic exoskeleton that is both intuitive and easy to use for people with reduced mobility
- **Stigo,** the fold-and-carry scooter (17 kg) that can drive 40 kilometres before it needs recharging
- **SIEL,** a new high-performance lithium polymer battery that is safer to use
- **Nelson Mandela Bay Project,** a public street lighting system for the Nelson Mandela Bay Municipality in South Africa using LEDs in the townships
- **TERI (Energy and Resources Institute)** in India invented new technology using a double-stage gasifier to improve electricity production and make access to it safer

Throughout the course of this year, the winners of the first edition of EDF Pulse were able to move ahead with developing their products and take advantage of the high visibility offered by the EDF Pulse programme.

«The EDF Pulse award really put us in the spotlight and we raised €500K in financing. We have since signed a trade and development partnership with Philips, entered into a R&D partnership with the CEA, opened the doors to our greater-Paris showroom at the graduate engineering school, Ecole des Ponts et Chaussées, and launched the development of Echy worldwide.» Florent Longa, Echy founder

«Since we won the EDF Pulse Award, our development is moving forward. We have created a walking robot in order to test out our algorithms before implanting them in the exoskeleton. We are also in the middle of raising financing.» Alexandra Rehbinder, Development Manager, Wandercraft

As innovation and progress are embedded in the Group's DNA, EDF has also established the **EDF Pulse In-house Awards.** Goal: showcase and recognise initiatives and innovative projects led by our employees both in France and abroad regardless of their position or rank within EDF Group.

In 2015 with close to 140 submitted projects, **EDF Pulse In-house Awards** honoured 13 winners.

— CONTACT —

PRESS OFFICE

+ 33(1) 40 42 46 37

SERVICE-DE-PRESSE@EDF.FR

EDF SA — 22-30, avenue de Wagram — 75382 Paris cedex 08
Capital de 930 004 234 euros — 552 081 317 R.C.S. Paris