



#100 INNOVATIONS

Innovation Book 2016





ENGIE develops its businesses (power, natural gas, energy services) around a model based on responsible growth to take on the major challenges of energy's transition to a low-carbon economy: access to sustainable energy, climate-change mitigation and adaptation and the rational use of resources.

The Group provides individuals, cities and businesses with highly efficient and innovative solutions largely based on its expertise in four key sectors: renewable energy, energy efficiency, liquefied natural gas and digital technology. ENGIE employs 154,950 people worldwide and achieved revenues of €69.9 billion in 2015.

The Group is listed on the Paris and Brussels stock exchanges (ENGI) and is represented in the main international indices: CAC 40, BEL 20, DJ Euro Stoxx 50, Euronext 100, FTSE Eurotop 100, MSCI Europe, DJSI World, DJSI Europe and Euronext Vigeo (Eurozone 120, Europe 120 and France 20).

Key figures*



No.1
independent
power producer
in the world.

154,950
employees throughout
the world.

€69.9
billion in 2015
revenues.

Operations in
70 countries.

€22 billion
of investments
over 2016-2018.

1000
researchers and experts
at **11** R&D centers.

* All figures apply at December 31, 2015. They take into account 100% of the capacity of assets held by the Group regardless of the actual holding rate.

Editorial

Our company project encourages risk taking and innovation: two values that support the transformation of ENGIE.

This is the mission of our innovation teams, who have launched several initiatives over the past two years, including investments in innovative startups, an incubation program for employee projects, and calls for projects. We develop an ecosystem by connecting people inside and outside our Group. This enables faster integration of new territories to the core of ENGIE's activities.

This new dynamic springs from an internal culture of innovation built through 30 years of ENGIE's Innovation Trophies.

In 2015, we decided to communicate more broadly about the event, which is a testimony of ENGIE's employees inventiveness and demonstrates their commitment to transforming the daily lives of millions of people. We set up fruitful cooperations with startups, integrated several innovations to address our client's needs, took into account local markets, and benefited from new algorithms efficiency and digital uses to enhance the technical and technological creativity of our teams.

The 2016 Innovation Trophies met with a record participation, with 580 entries submitted from 62 countries! 52 of these were nominated to appear before a Grand Jury, who commonly selected the 15 award winners. In this book you will discover the hundred internal innovations that mark 2016 and the diversity of our approaches and achievements.

Isabelle Kocher
CEO



“
Innovations
Trophies are a
testimony of
ENGIE's employees
inventiveness.
”



Innovation at ENGIE

A major utility for over 150 years, ENGIE is convinced that the world of energy is undergoing a profound and lasting transformation. In this context, the Group has set itself the goal of becoming Europe's leader in energy transition, in particular by focusing on innovation. This drive is at the core of the Group's efforts to transform good ideas into operational services for the benefit of its customers.

So far, four key sectors have been identified:

- Decentralized Renewable Power Generation, Demand-side Management and Energy Storage ;
- Smart Home ;
- Cities of Tomorrow and Urban Mobility ;
- Digital Management of Energy Efficiency.

The Group's internal organization also evolved to boost entrepreneurial creativity. New tools and processes have also been developed so that innovation can contribute sustainably to the Group's growth.

ENGIE New Ventures, a €115 million corporate venture capital fund, has been launched to support innovative startups. An incubation process for employees' projects has been set up, supporting 20 projects so far. Calls for projects are also regularly launched to get innovative proposals from start-ups.

Key figures in innovation



€115 million

current investment budget of ENGIE New Ventures, the Group's Corporate Venture Capital Fund, which has

invested **€31 million** in startups so far.

Close to **20** employee-led projects incubated in **12** partner incubators.

A network of more than **50** innovation managers across the Group.

30 calls for projects launched since 2014, with gathered **550** propositions from startups.

10,000

employees are members of innov@ENGIE, the Group's internal hub for innovation.

More than **450** ideas of innovations proposed by employees on innov@ENGIE.

2016 Innovation Trophies

The Innovation Trophies have been rewarding innovations by ENGIE employees for 30 years.

Projects are selected over the course of several months and go through several phases, to end with a list of nominated projects. These shortlisted projects are then presented to a Grand Jury, who selects the final winners. This year, for the first time, participants were given the opportunity to present their projects in person to the panel. Another evolution was in the composition of the panel of judges, who welcomed three members from outside the Group.

The projects in this catalog are divided into six categories, each representing different aspects of innovation at ENGIE.

580
entries submitted.

153
entries selected
by **25** of the Group's business units.

52
projects nominated, including
5 Success Stories.



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To find any file on the ENGIE intranet, use the full file no. preceded 2016, i.e.:
2016-0000**426**.

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CSR



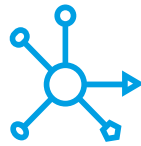
HANDY



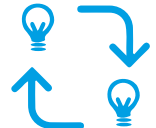
LNG



BIOMASS



INTEGRATED OFFERING



KNOWLEDGE MANAGEMENT



DATA ANALYTICS



NEW CUSTOMER RELATION



NUCLEAR POWER



MINI & SMART GRIDS



AIR QUALITY



IOT



SITE RECOVERY



DRONES & ROBOTS



ENERGY STORAGE,
BATTERIES AND HYDROGEN

Flourishing through Success

Success Stories

The biggest value-generating innovations from previous publications.

01



Reloading and Transshipment

Innovative services to adapt to the new LNG logistics.

In 2012, Montoir-de-Bretagne and Fos Cavaou LNG Terminals (France) developed a new reloading service for vessels. Since then, this offering has seen major success with 39 transactions and a long-term contract signed in Montoir. Since the 2013 Innovation Trophies, the value created has jumped from €2 M to €40 M.



THE TEAM

Jean-Marc LE GALL, Raphael PUJOL, Mehdi BENMENI, Pierre BERNOUX

SST-01 // Elengy

SSINERGIE

Development of a smart energy monitoring service called Vertuoz for B2B, B2B2C and B2T market.

Many managers of public and private real estate contracts are keen to improve their buildings' energy performance. They hope to create a consolidated, flexible overview of their estates' consumption based on relevant, real-time information (multi-fluids, multi-purpose, multi-site).

Vertuoz offers a flexible customer dashboard which can make this a reality across ENGIE contracts.

The solution was initially focused on energy and environmental performance measurement, but thanks to early successes (70,000 buildings), its scope was expanded in 2015, and now Vertuoz is available to industrial contracts, too with the Vertuoz Circle.



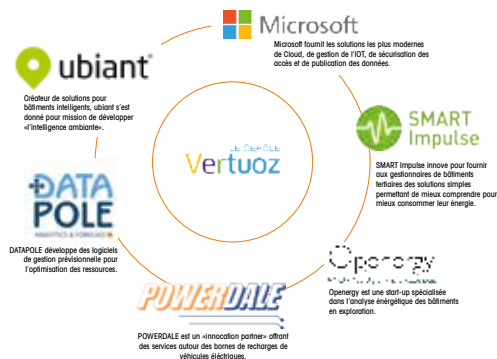
Another big data industry platform has been added :



THE TEAM

Olivier GRESLE,
Thierry BOUZIGUES,
Valérie BEAUDICHON,
Tanguy MATHON

SST-02 //
France B2B



NIALM

An innovative technology to boost new businesses in Energy Efficiency.

Relying on non-intrusive technologies, NIALM determines the consumption of a building based on a single point of consumption. ENGIE incorporated this breakthrough technology in its offers to develop numerous business models that have generated €100M in 3 years.

SST-03 // France B2B

THE TEAM

Mathieu CHARBONNIER,
Carole LE GALL,
Maxence BUREAU,
Karine LE BOURG,
Jean-Luc BILLIANI,
Vincent GASCHIGNARD

Ammonia thermosyphon free cooling system

ENGIE Axima has bundled extensive knowledge and refrigeration expertise to build a new cooling system reducing energy consumption up to 40% .

ENGIE Axima's revolutionary refrigerant solution integrates two new valves into a standard ammonia plant setup. This makes it possible to put the compressor on standby and switch to thermosyphon-free cooling. Thermosyphon-free cool-

ing uses the natural circulation of ammonia, removing the need for a compressor or additional components. The power consumption required is limited to the condenser fans, saving substantial amounts of energy.

THE TEAM

Jim GELDHOF,
Gert TIMMERMANS,
Joachim HOUTEKIER,
Peter CAMERLINCK

SST-04 // France B2B

MES-Toolbox

THE TEAM

Siem BROERSEN,
George GEERVLIET,
Tjeerd MANUSSEN

SST-05 // BENELUX

Increasing plant production capacities.

Launched in 2002, MES-Toolbox increases and optimizes the production capacity of multiple production plants (such as industrial bakeries and chemical manufacturers) using an open-source web app.

MES – Toolbox increases production capacity by more than 10%. This solution, which is available in eight languages, is installed in more than 80 plants worldwide.

Building sustainable solutions

Operational, Techniques,
and Technology Performance.

02





Smart Facility Concept

THE TEAM

Philippe BOUCHY,
Eric SAUNIER,
Stéphane DECHIPRE,
Fabian RUPIN,
Philippe MOREL

319 // Elengy

Radio-based LNG leak detection at the Montoir-de-Bretagne LNG terminal.

French law requires two independent leak detection systems on LNG terminals along the LNG pipelines.

Elengy decided to set up a detection system at the Montoir-de-Bretagne LNG terminal, based around the “RF Max” technology which allows long-distance radio communication between objects over a secure private network, and meets the regulations governing Instrumented Risk Management Measures for Seveso sites (MMRi).



This innovation is based on the design of a connected, energy self-sufficient “ATEX” sensor (EXplosive ATmo-sphere) that is able to withstand extreme temperatures (-180°C). ENGIE Ineo Energy & Systems was given responsibility for developing the system.

Due to the simplicity of the roll-out and installation of the system, commissioning times are considerably reduced.



HOMEMADE LNG TRUCK LOADING STATION

GNL Mejillones has constructed an LNG terminal built entirely on site and using their own resources for engineering, construction and exploitation to increase the availability of LNG in the north of Chile. GNL Mejillones will become a LNG hub in this large, narrow country where energy needs are widely spread. This innovative solution means that mines and industrial sites can now be supplied with LNG in the place of diesel, currently used, and benefit from the lower cost and reduced environmental impact of LNG.

THE TEAM

Eric ROA TOLEDO, Silvana CARDENAS
COMICHEO, Germán TAPIA VASQUEZ,
Daniel GARCIA HERNÁNDEZ

333 // Latin America



AMAZONIA

The Amazonia project revolutionizes buildings by attributing them with a new function: effectively removing pollutants in the air using disruptive innovation technology and in a way that suits everyone, in order to help purify air and improve living conditions.

THE TEAM

Marianne GALLARDO, Charles-Edouard
DELPierre, Elvia MARCELLAN,
Cristian MURESAN

009 // NewCorp

Chemical free cleaning



The Aqueous Ozone system enables cleaning operatives to clean and sanitize buildings without the use of harmful chemicals.

This chemical free cleaning system cuts costs, increases productivity, eliminates health and safety issues and provides a sustainable solution for ENGIE’s clients. It has already been successfully implemented with 4 UK clients at 10 sites.

THE TEAM

Holly STOCKBRIDGE

055 //

UK

Biopolymers

THE TEAM

Marianne GALLARDO,
Philippe BOUCHY,
Mailys PALE

199 // NewCorp

An unprecedented “green” treatment to combat biofouling on underwater structures.

Biofouling, the spontaneous colonization of submerged structures by aquatic organisms, is a serious problem for vessel hulls but also for pipelines or heat exchangers. The corresponding global cost increase is estimated at over \$4 billion per year. Treatment with chlorine and chlorine derivatives remains the most common approach.



The use of biopolymers as anti-biofouling agents is a world first. They are more environmentally friendly (70% of the biopolymers degraded in a fortnight) and achieve greater societal acceptance of LNG terminal sites.

Two patents have been filed on the biotechnology involved, and more specifically on the use of exopolysaccharide biopolymers (sugars) derived from bacterial strains of marine origin. This green and original solution can be applied for any submerged industrial structure.

Gjøa Inclination test

Performing Gjøa semi-submersible platform inclination test “on site” during full production to document Gjøa weight reserves.

The management of the Gjøa platform (situated off the coast of Norway) required specific space and weight allowances to ensure the structure remained afloat.

This challenge was due to the fact that the platform had sufficient space but limited weight reserves. These reserves are usually determined by an inclining test near shores. The inclination test on site during full production is a first for a semisub.

Thanks to this test, weight reserves of 2,000 Tonnes have been evidenced and are welcoming new production.



THE TEAM

Ingrid R. DEVOLD
TORJUSSEN,
Hans C. RENTSCH,
Åse B. ANDERSEN,
Ørjan MIDTTVEIT,
Linda LØVERSEN

203 // EPI

A NEW APPROACH IN EXPLORATION - PRODUCTION

ENGIE has developed an advanced DVR (data validation and reconciliation) application, which allocates the oil, water and natural gas production to individual wells. The application offers an inexpensive and very accurate model for allocation in real time, enabling better knowledge of oil fields. It is based on a mathematical model which collects data from over 1000 measurements, from oil rigs to meters, and compares them with material reports.

THE TEAM

Stephan DEN BLEKER, Diederik WESTERHOF

381 // EPI

CARTESOM

CarteSom analyzes uncertainties concerning structural maps of underground natural gas storage reservoirs or deposits in exploration-production. CarteSom was developed internally and maintains the geological coherence of the model in order to calculate accurate forecasts for the performance of the reserves. A patent was filed for this model in 2013.

THE TEAM

Frédéric HUGUET

066 // Storengy

ULTIM

Bottom/surface simulation tool for the operation of a underground natural gas storage site.

One of the major challenges faced by Storengy is to improve the short-term technical performance of its underground natural gas storage sites.

ULTIM has several interesting features: accurate imaging of the operating and technical performance of assets, tool flexibility, achievement of ample savings through better leveraging of short-term performance and a consolidated catalogue offering.

This new tool, thanks to its simulation capacities and its connection with production data, provides not only simulation but also a short term underground storage site management solution. ULTIM can also test configurations and train site operators. It is currently undergoing international deployment.

THE TEAM

Emmanuel FREITAG,
Gregory LEBRUN,
Arnaud LANGE

026 // Storengy





Precision 3-axis aligner

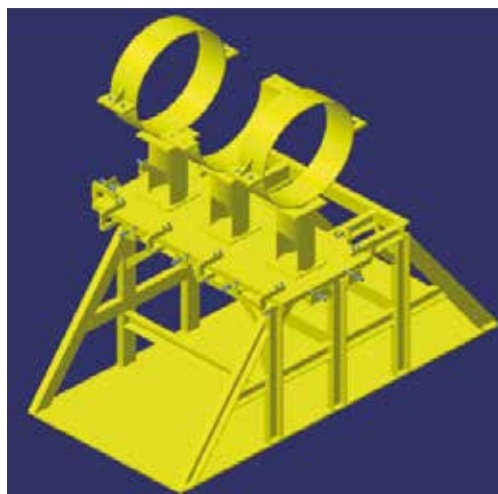
A system to allow very accurate positioning of propeller shaft brackets on ships.

The solution developed by ENGIE Endel allows very accurate alignment (to 1/10th of a mm) on an ortho-normal frame while also offering time savings (of about 25%) on the duration of repairs and improving the safety aspect (operation performed without hoists).

THE TEAM

Stéphane LE BRIS, Florian SIMON

091 // France B2B



Repair robot for embankment dams

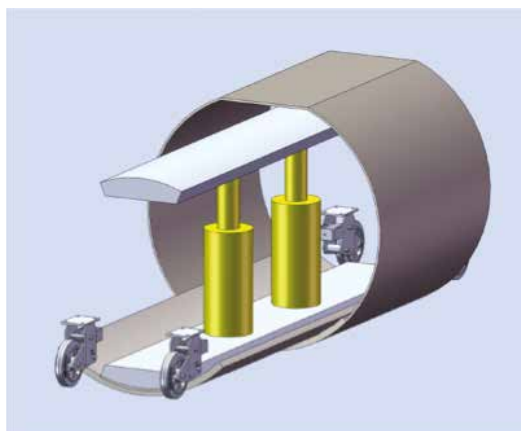
Repairs drain pipes on partially damaged hydroelectric dams without having to work on the whole conduit and limits the exposure of operators during reconstruction work.

Following the 2013 discovery of local penstock buckling 1100 mm in diameter at the Titaaviri 2 dam (Tahiti), traditional repair solutions were rejected for reasons of cost, time and security. So EDT ENGIE's operating teams developed a repair robot to reconstruct the penstock in situ over one or two meters' length.

THE TEAM

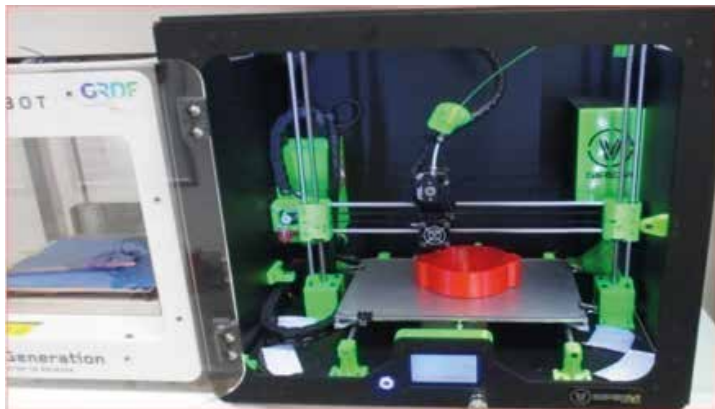
Yann WOLFF, Laurent AROMAITERAI,
Mike ARUTAH

084 // France Networks



The “valve stop”

A universal device to shut off water and natural gas valves.



Several thousand natural gas valves located inside buildings must be closed and sealed off to be isolated from the external network. These valves have multiple forms, operating principles, and installation types (wall, buried, aerial).

This valve stop is first and foremost a device that can shut off all of these types of valves, both gas and water, preventing any possible operation of the closed valves. Furthermore, it is the 1st result of GRDF's use of the “FabLab” in France's Mediterranean Region and of its new technologies (3D scanner and 3D printer) that accelerate the cultural transformation of the teams, and allow for innovation via rapid prototyping.

THE TEAM

Florence CORLAY,
Romuald CARRE,
Philippe FRONTERO

163 // GRDF



COOLING VEST

This simple solution improves conditions for workers during activities in a high ambient temperature. Certain tasks, such as laying biological protection or removing asbestos from functioning equipment, require specific precautions to be taken against the dangers of dehydration or loss of concentration. This vest limits the negative impact on workers' health and safety.

THE TEAM

Jean-Marc LEFIEVRE, Bastien GASNIER

115 // France B2B

SAFETY ACCESS POINT WARNING SIGN

A removable warning sign allows access to Safety Access Points Taps in parking areas during work on gas networks. The removable yellow bollard, identified through the wording “natural gas works”, is physically attached to the tap window via a hook. Made of aluminum due to the low weight and robustness of this material, its optimized design limits the burden placed on staff members.

THE TEAM

Patrice BUSCHINSKI, Bruno GOURLIN

020 // GRDF

Multi-function Catalysts

Allowing the reduction of the environmental impact of activities while increasing the operating revenues and decreasing the investment and maintenance costs.

THE TEAM

François GRESSIER,
Neal COFFEY,
Andrew ARRUDA,
Marie WHITTAKER

348 //

North America

Catalysts are used to decrease the concentration of pollutants going into the atmosphere. In North America, 27 ENGIE units contain a NOx catalyst and 11 units also contain a CO/VOC catalyst.

Competitive bids were opened amongst the major Original Equipment Manufacturers (OEM) during which a new product (concept) was introduced : a multi-function catalyst to replace a NOx and a CO/VOC catalyst at the same time.

In November 2015, Ennis was the first electricity plant to successfully install and operate this multi-function catalyst in ENGIE North America fleet. Its advantages include: a wider load flexibility, reduction of the pressure drop through the HRSG, reduction of the gas consumed and reduction of the CO/VOC emissions going to the atmosphere.



ELHOM® SOLUTION

Elhom® Solution provides services for maintenance work on public lighting. Based on a mobile application, it provides time savings for ENGIE Ineo teams and improves the traceability of equipment. Technicians can geolocalize equipment, have direct access to technical data (maps and 3D models) and fill in visit reports directly on site. Implementing Elhom® Solution has transformed working conditions for maintenance workers.

THE TEAM

Maman IDI-CHEFFOU, Jean-Luc GODON,
Jean-Pascal HENROTTE, Eddy LEVY,
Pascale DELLEUR, Frédéric PEDRO
(Singularity Insight)

587 // GRDF

THE TEAM

Sophie FROMONT, Sandrine ORIA,
Mohamed BENABDALLAH, Bastien
COLOMINE, Eric ELAIN

283 // France B2B



Great Minds...

Successful restart of Belgian Doel 3 and Tihange 2 Nuclear Power Plants after approval of the world's first Safety Case on hydrogen flaking in the Reactor Pressure Vessel.

During the 2012 outage at Doel 3 and Tihange 2 nuclear power plants, specific ultrasonic in-service inspections revealed thousands of potential defects in the Reactor Pressure Vessel, a key component which can't be replaced. The two NPPs had to stay shut down, causing a loss of about €40M per month on EBIT.

Research confirmed the presence of hydrogen flakes in the vessel. An innovative approach had to be developed covering complex destructive investigations on flaked material to demonstrate the capability of the applied ultrasound technique to fully detect and characterize flakes.



THE TEAM

Jean VAN VYVE,
Robert GÉRARD,
Philippe DOMBRET,
Valéry LACROIX,
Séverine DE VROEY,
Didier BOURDEAUX,
Michel DE SMET,
Steven GOEDSEELS,
Dominique MOUSSEBOIS

528 // BENELUX

After providing a convincing Safety Case to the Belgian Safety Authority and satisfying answers to all questions raised by external experts, ENGIE received the authorization to safely restart the plants in December 2015. The Group avoided €1.3 billion of cash and non-cash impairments. In addition, the Safety Case and its approach are becoming an international reference.

RE(T)PRO MOTORS

This project has been developed to creatively and successfully address emerging obsolescence issues for electrical motors in nuclear power plants. Instead of buying new motors and having them certified for use for nuclear technology, this innovative approach consisted in renovating the old motors according to the initial fabrication procedures and nuclear qualifications, and insourcing the most critical stages. This enables a considerable amount of time to be saved and a reduction in costs of at least €26.6 million for the nuclear power plants in Belgium, as well as new business for ENGIE Fabricom.

THE TEAM

Sam BODDAERT, Patrick VERLEY, Willy VAN EETVELD, Christian DELHAYE, Vic MEYKENS,
Eddy FRANCKEN, Philippe DENEVE

522 // Generation Europe



Cable unwinding by drone

Tools and method for cable unwinding with the use of drones to replace helicopters for the construction of very high voltage power lines.

A multirotor (rotary-wing) drone is equipped with a suspension system permitting it to secure a light synthetic cable with very high resistance. The drone is operated by a remote pilot. A puller/tensioner is set up on-site, on the ground. The tensioner controls the speed and tension of the cable based on the movement of the drone. The puller is then used in the following stage to pull large-diameter cables.

This technique is two to three times less expensive than unwinding by helicopter, and allows work to be carried out in protected areas.



THE TEAM

Jérôme AGUIHLON,
Geoffroy LEVY

121 //

France B2B



ANTI-DRONE SYSTEM - DRONE FENCE

A system for detection, alert and recording evidence against illegal drone flights. The solution is designed for sensitive facilities such as nuclear power plants, and is incorporated in a box which detects, alerts and collects evidence to fight more effectively against crimes committed by remote pilots.

THE TEAM

Pierre-Inti HEBRARD CAPDEVILLE, Joël MOMPO, Stéphane DECHIPRE

194 // France B2B



USING DRONES IN HYDROELECTRIC PROJECTS

Drone mapping provides astounding aerial views of dam projects, facilitates understanding of dam sites and enables rapid collection of topographic data. The use of drones for the fast analysis of a project area allows a more accurate topographic data collection than information currently supplied by usual cartography techniques. It also allows the possible options of a project to be assessed rapidly. The technique is perfectly adapted, modern and economical and shortens the decision making process.

THE TEAM

Benjamin COUTAND, Nicolas TROLONGE, Christophe DAUX, François HALGAND

189 // Tractebel



ENGIE "HACK THE DRONE", THE WORLD'S FIRST DRONE HACKATHON

From 24 to 26 April 2015, ENGIE organized the first hackathon devoted to drones, in order to invent the civil uses of the future. Four topics were addressed: distance measuring, analyzing points of corrosion or distortion on piping, neutralizing drones in flight without causing danger, and designing a light and inexpensive system against collisions. The event brought together over 200 participants who submitted 28 projects to develop applications for industrial usage.

THE TEAM

Ludovic PARISOT, Vincent CHAUVIN, Pierre-Inti HEBRARD-CAPDEVILLE, Pascal DELCEY, Andres GALNARES, Jean-Luc GODON, Philippe LOUVEL, Isabelle FONDIMARE, Patrick COMONT, Commandant GIGAN (French Air Force)

178 // NewCorp



TAKING MEASUREMENTS AND COLLECTING TOPOMETRIC DATA USING DRONES

Subsequent to the ENGIE "Hack the Drone" in April 2015 and to an open innovation project with one of the winning teams, an original solution was created. This innovative solution for the collection of topometric data is made from a remote meter placed on two axes and controlled by computer vision. It allows measurements and topometric data to be collected from a distance using a drone in complex and difficult environments, such as the EPR in Flamanville (France).

THE TEAM

Vincent CHAUVIN, Isabelle FONDIMARE, Ludovic PARISOT, Pascal DELCEY

097 // France B2B



Modernization of the biomass intake chain

Joint development and implementation of a rapid and connected humidity measurement system.

The biomass moisture value is the most important parameter in the management of a wood energy plant. Accurate knowledge of this parameter is essential to qualify the fuel delivered in order to best configure the boiler, determine its efficiency level, initiate the billing chain, negotiate with wood suppliers.

The traditional method consists of taking a single humidity measurement lasting 24 hours at least, and preventing any flexibility in the supply chain.

The successful joint development, in collaboration with a French startup, of a moisture measurement system that is rapid, reliable, connected and perfectly suited to operator needs triggered an improvement in measuring reliability, speed, traceability and boiler configuration.

THE TEAM

Jean-Baptiste POLJAK,
Nicolas CERDAN,
Brice MORIN, Marc LERAT,

436 // France B2B



MOBIBOX SERVICES

MOBIBOX Services offers an innovative solution for SMEs, local authorities or even individuals for the sale of renewable energy based on a mobile Box concept. This connected transportation and storage unit is designed to supply fuel for pellet boilers via a plug and play link system. Customers will, for example, be able to place their order according to their needs using their smart phone.

THE TEAM

Olivier GUERRINI, Elodie LE CADRE-LORET,
Joël FAMERY, Patrick SUBREVILLE.

544 // NewCorp

BIM BY ENGIE

Building Information Modeling (BIM) is an active, changeable and interoperable data base to last for the entirety of a building's lifespan. BIM is currently being developed in the buildings sector, and is based on a process of centralizing data in a digital 3D model. We are extending the field of application to cover use and maintenance in order to make it a tool for active management throughout a building's life cycle.

THE TEAM

Marcello CACIOLO, Mariane GOCZKOWSKI,
Damien SELLET

328 // France B2B



Smart Sizing

Solving key Energy Transition challenges in Power Distribution Grids.

While energy transition is materializing in distribution networks through higher shares of distributed generation and new control devices, the core methodologies and tools have remained largely unchanged.



The Smart Sizing tool itself allows modeling of both technical and economic aspects when planning investments in the distribution grid. The main innovations of the tool are its ability to take into account multiple and possibly conflicting objectives (e.g. operation and infrastructure costs); modeling of both distributed generation (PV, wind, CHP, etc.) and distribution grid; modeling of all flexibility sources (Demand Response, Generation, storage).

THE TEAM

Stéphane RAPOPORT,
Parvathy CHITTUR,
Sébastien LEYDER,
Christophe DEL MARMOL,
Stijn COLE

514 // BENELUX

BIM BANG FOR ITER

In order to meet the challenges faced by our client ITER, we have put in place a research structure enabling cooperation between different professions and “dialogue” between information systems that are considered incompatible (CATIA and PDMS). The chosen solution deals with exceptional amounts of data given the size of the ITER project and is part of an approach using a digital model, guaranteeing the durability of data from design to use.

THE TEAM

Julie VESZ, Cédric BOURBON,
Sébastien BROSSETTE, Martin SERPAULT,
Yoann SESTIER

304 // France B2B



SMART GRID FOR SOLAR THERMAL ENERGY

Development of a series of technologies for generating, transporting and storing solar heat on a city scale, supplying 80% of buildings' heat requirements. A new model of thermal micro-network pools energy generated by thermal solar cells in several locations and keeps it in a storage site able to hold the energy from one season to the next. This architecture opens doors to using solar heat in dense urban areas.

THE TEAM

Bertrand GUILLOT, Fabrice RENAUDE,
Julien DUMAS

540 // France B2B

Imagining the future

New activities.

03





Mini grids for mobile network operators in Africa

Providing reliable electricity to mobile network operators in Sub-Saharan Africa.

THE TEAM

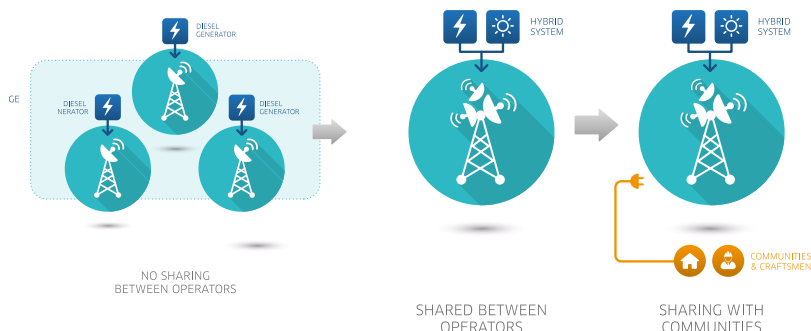
Jacques-Olivier KLOTZ,
Juan García MONTES,
Adil CHÉNAF,
Emilie FORSTER,
Arnaud DAVY,
Bouchra EL HAYANI,
Jean-Luc BILLIANI,
Vanessa DEVYS-CASPAR,
Maxime MARION

180 // Africa

Sub-Saharan Africa has a total of over 240,000 towers while less than 20% of communities have access to electricity. Providing renewable solutions instead or together with fuel generators will improve the availability and cost of the electricity. Acting as a power provider will allow telecom sites to be shared between operators and will significantly decrease the OPEX for customers.

BU Africa will leverage on Power Corner, an ENGIE incubated business now in acceleration, to build a solution anchored in the territories.

ENGIE is starting on a market potential of 12 million people to serve through mini grids in Cameroon, Senegal and the Ivory Coast. Pilot mini grids will be operational before the end of 2016.



POWER-SPLIT TRANSMISSION FOR CONVERTING WAVE ENERGY

ENGIE has entered into a partnership with Ghent University (Belgium) for designing new power conversion technology for absorption of wave energy, enabling a higher energy yield. Wave energy is an inexhaustive source of renewable of energy, but it is difficult to capture due to peak forces in storm condi-

tions, and variations in wave size and period. A planetary gearbox with three axis will be used to convert the energy, using machines connected to a flywheel for storing the energy. An smart general control system will optimally manage all three power flows (waves in, generator, and auxiliary out).

THE TEAM

Dennis RENSON, Bart MEUWISSEN, Jo MONTENS,
Rik VAN SOETENDAEL

269 // BENELUX

BATTERY AND HYDROGEN ENERGY STORAGE



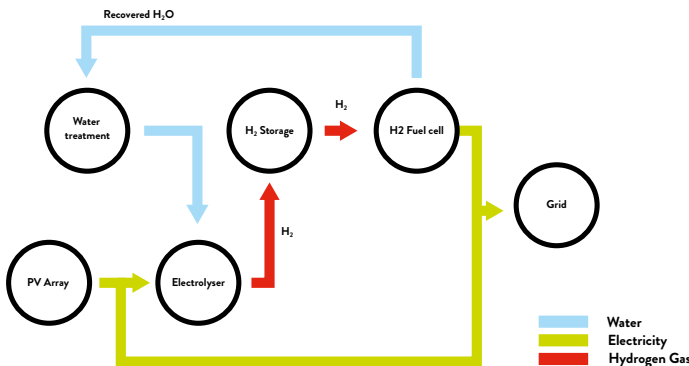
ENGIE Hydrogen Solutions

THE TEAM

Quentin VAQUETTE,
Walter PORCEL

184 // Asia-Pacific

A new power plant design and implementation strategy, to replace large-scale (5 to 20MW) distributed diesel-fired power generation in remote areas, based on solar PV and hydrogen energy storage. A 100% renewable energy solution.



Hydrogen technology has achieved a level of technological and economic maturity, which so far has been left unnoticed by most industry players.

This is the opportunity for ENGIE to pioneer innovation in this strategic field by deploying environmentally and socially responsible power solutions while opening-up a whole new profitable and growing market.

CUSTOMER PEAK DEMAND REDUCTION ALGORITHMS FOR ENERGY STORAGE DEVICES

The solution is a combination of algorithms designed to optimize the behind-the-meter batteries for peak demand dispatch which can also be used for sizing such systems for customers. The algorithms that were developed help predict how well a particular battery would be able to solve peak demand reduction. Even more useful, it serves as the core algorithm of a battery system platform which can monitor customer loads in real-time and operate a battery to save customers money.

THE TEAM

Jason GOODHAND, Mark BROWN, Ekaterina SOKOLOVA

574 // North America

SITE RECOVERY



“A la carte” menu for a datacenter park

Integrated re-use of the Eemshaven power plant for a datacenter park with a multi-service menu offering.

Many power plants, such as the Eemshaven plant (The Netherlands), are struggling with profitability on their core activity and are looking for new business opportunities. This project is a “first of a kind” where a datacenter ecosystem is being co-created with an external partner using competences from both parties.

THE TEAM

Tina TIJSMa, Harry
TALEN, Harrie BLONDEEL,
Elmer BOS, Paul WOUda

496 // Generation
Europe



THE GREEN DELTA OF NIJMEGEN

We helped transform the Eemshaven coal-fired power plant into «The Green Delta of Nijmegen», by aligning changing regulations with ENGIE's strategy for renewable energy solutions, and launched a site-development programme. It started with proven technologies: Solar panels, LNG bunkering for ships, wind turbines and biomass CHP (connection to city heat-grid). Innovative initiatives are currently being studied with stakeholders, including a biomass refinery, an LNG station for trucks, biomass fermentation and a biomass hub.

THE TEAM

Jeroen SCHAAFSMA, Vincent SCHAKEL, Rob VAN DER GEER, Pim VERSTAPPEN, Jeroen DAEY OWENS

300 // BENELUX



INITIATIVES FOR THE FUTURE OF MAJOR RIVERS (IFMR)

The goal of this initiative is to bring together river managers and experts from across the world to find innovative solutions for the future of our rivers.

The IFMR panel consists of 17 members including river managers, hydrologists, anthropologists, economists... Municipalities, the academic world and companies have all expressed their appreciation for the innovative aspect of this initiative. The project's visibility with political decision-makers represents a long-term competitive advantage for CNR (Compagnie Nationale du Rhône).

THE TEAM

Bertrand PORQUET, Pierre MEFFRE

460 // France Renewables



NORTHGATE DISTRICT COOLING SYSTEM PROJECT

The Northgate District Cooling System (DCS) project will replace existing standalone air-cooled chillers in the Northgate Cyberzone area, near Manila (the Philippines). The project will contribute to making this area more sustainable, with a reduction of 11,500 tons of CO₂ per year, and more economically attractive by reducing the cost of chilled water by 13%. The DCS will generate chilled water centrally using electrically driven chillers, for distribution around the site in insulated chilled water pipes.

THE TEAM

Eric GRAEF, Anne MICLO,
Stefan GUNNARSSON

008 // Asia-Pacific



CLOSURE OF THE NIJMEGEN POWER PLANT

When the closure of the power plant in Nijmegen (the Netherlands) was announced, the goal was to manage insecurity, safety and other performance issues, while at same time allowing all the employees to find another job.

The idea was to cooperate with companies that were recruiting personnel in the region. The companies and employees were able to meet quickly, reducing uncertainty for employees and filling skill gaps for companies. Meanwhile, ENGIE was able to run operations smoothly until closure.

THE TEAM

Sander DOMENSINO, Pieter DE JONG, Koert MOLENWIJK, Richard ALBERTS, Jeroen SCHAAFSTMA

413 // Generation Europe

MySphair is intended to allow individuals to drastically reduce air pollution in their homes thanks to an interactive diagnostic and an innovative air purification solution.

Indoor air is five times as polluted as the air outside. In spite of this, most people feel protected at home. MySphair's ambition is to improve the health of its individual customers, offering them a connected object that will allow them to drastically reduce the pollutants they breathe in at home, where they spend more than 50% of their time. MySphair has been incubated by ENGIE since November 2015.



THE TEAM

Eléonore BON,
Jérôme SENOT

570 // NewCorp

CL'EASE

The Cl'ease initiative complements local transport options available, combining a dynamic carpooling platform for daily commutes and long-term lease of electric vehicles, with rate reductions according to the amount of carpooling. Many suburban areas are facing heavy road traffic, causing the saturation of major highways, increased atmospheric pollution, and unofficial carpooling. Cl'ease combines electric vehicle leasing services with a dynamic carpooling platform specifically adapted to rural and suburban areas. The results speak for themselves : 1 Cl'ease vehicle replaces 4 conventional vehicles on the road, and drivers can pay 5 times less than what they would with a standard vehicle.

THE TEAM

Solenne CUCCHI, Elvire TOURILLON,
Sandrine LEMPERRIERE

467 // France B2B

FLOATING PHOTOVOLTAIC POWER GENERATION

PVDAM is an innovative floating solar concept with standard photovoltaic (PV) panels, installed primarily on hydropower plant dam reservoirs, and offering possible extension to suitable irrigation and drinking water reservoirs, quarry lakes or purification and tailing ponds. Floating PV solar power can technically supplement the daily production of hydroelectric power plants during dry-seasons, by acting as an efficient energy storage system.

THE TEAM

Thomas BLAGNIE, Rebecca ALBERTI,
Lucile BOTET, Siebert BRESSINCK,
Jean-Paul MOSSOUX

537 // Tractebel

50five

50five is an intrapreneurial project to create, run and develop, with limited resources, an end-to-end stand alone webshop.



The market of the Internet of Things (IoT) is booming and very promising for all segments. Live 24/7 in the UK, Benelux and Germany, 50five aims to develop smart home solution for specific moments in life (births, retirement, moving house etc.).

The webshop is positioned as the IoT online channel of several ENGIE companies. The sales in 2015 were 9x higher than forecasts.

THE TEAM

Manfred KLUMPENAAR, Bert FABRI, Egbert HIETBERG, Axelle HENROTAY, Denis BRUNK, Thomas-Louis DE SCHIETERE DE LOPHEM

483 // NewCorp

SKaLP

Development of an extra-flat antenna system for communicating via satellite on the Ka band (new very-high bandwidth satellite) that can be directly installed in the carrier (airplane, ship, train, land vehicle, etc.).

ENGIE Ineo Defense has developed and patented a new technology that allows very-high bandwidth communications with a satellite without having to physically move the antenna (electronic orientation of the beam) and with a single antenna for emitting and receiving data. The system's nominal size is half that of comparable devices and technology allows the system to be installed inside the vehicle. The need exists in fields ranging from civil aviation to the military.

489 // France B2B

THE TEAM

Xavier TALBOT, Gérard COLLIGNON, Pascal CAILLEAU, Thibaut ROLLAND

BluePower

Launching a low-cost co-generation offer on the European B2B market.

BluePower's objective is to offer 20 kW of reliable, adaptable, and efficient electricity for €19k. BluePower offers European BtoB customers the chance to save energy by becoming decentralized producers.

THE TEAM

Nathalie FILIPPINI, Gérard COLLING, Youness HSSAINI, Patrick ROBINET, David DUPUIS, Alain WELMANT, Luc CASTADOT

364 // France B2B



SMART LNG CARRIER

This project for smart LNG carriers is designed to allow technical information and data from operations to be collected and analyzed to improve the efficiency of ships. Large amounts of information is collected on LNG carriers by sensors. Although the information is sent to a central computer (IAS - Integrated Automation System) to control some of the ship's parameters, none of this IAS data is stored or analyzed in order to improve performance. The aim of this project is to collect and relay data back to land for analysis in order to reduce maintenance and operations costs.

THE TEAM

Eric LEPESAN, Adrien BRE, Sébastien DUQUESNOY

260 // Global LNG



GRAVIFLOAT

GraviFloat is a small-scale integrated solution incorporating a jetty, storage and regasification of LNG, and power production. It will allow ENGIE to develop a rapid and high-profit solution using LNG as a source of energy which is particularly suited to islands and developing countries. LNG storage, regasification and power production are assembled within a single, independent structure fixed to the seabed with piles. This solution is a first in the Group and among the actors in this sector.

THE TEAM

Frederic DEYBACH, Soizic LE GOFF, Arthur DELARGY, Clément BRICHART, Ezekiel BOYER

181 // NewCorp



Retroficiency Analytics Solution

Driving customer engagement through breakthrough SaaS digital & analytics solutions.

Retroficiency Analytics enables utilities to reinvent their customer experience and increase energy efficiency program adoption. It has already allowed the identification of business customers with 2x greater savings opportunity and the increase customer engagement by 4.

THE TEAM

Christopher MUTH, Bryan LONG, Michael KAPLAN,
Paul GAGNE, Jim JOHNSON, Jenny ZHAO

440 // North America



NEW DATA FOR A NEW APPROACH

GRDF has initiated an innovative consultative approach to improving the Annual Activity Report for natural gas distribution. This new approach, method and mentality conducive to collaboration brought together over 50 participants (contracting authorities, public ministries, the Commission for Energy Regulation, local government members' associations, certified public accountants, the contracting authority assistant etc.) for 5 workshops and 2 full sessions over a six-month period.

THE TEAM

Raphaëlle NAYRAL, Cécile NIVAUD, Benoît REYDELLET,
Pierre DRILLON

166 // GRDF

Going for Growth

Business Development.

04





Energy Navigator

A smart data engine which is turning a minimum amount of data into value for all stakeholders in the commercial real estate sector using smart data algorithms to remotely detect and manage energy saving opportunities.

Energy Navigator uses a three-step model:

- Business case identifier from only 5 data points,
- Remotely detecting energy saving measures with smart data algorithms including market leading pay back periods,
- Long term guaranteed energy and CO₂ savings with Energy Performance Management based on a single performance indicator.

Energy Navigator has already procured €15 M in deals for ENGIE Netherlands and 5,800 buildings will be connected to the system by the end of 2016.



THE TEAM

Giel VAN GERSBERGEN,
Bert ELKHUIZEN, Michel
VAN HEUMEN, Bart Jan
FRERIKS

437 // BENELUX



AN ULTRA-FLEXIBLE LOAD MANAGEMENT PRODUCT FOR MAXIMUM VALUE CREATION

By lowering the lag time between the request for demand response and effective demand response to only 15 seconds, we are able to offer an even more lucrative service to our industrial customers. We call it an ultra-flexible product because it makes the financial best of the customer's flexibility. Complete automation of the production chain and special contracted engineering were developed for the roll out of the solution.

THE TEAM

Eric DRUENNE, El Mehdi BEN MAALLA,
Guillaume FAUCONNE Bregt VERSCHUERE,
Gilles SCOUVART, Pierre CAROFF,
Loïc DONNAY DE CASTEAU, Bernard
DEBROUX, Maude BERTHOUMIEUX,
Cedric BUREAU

490 // Global Energy Management



POWEREDPEGASE

PoweredPegase is a flexible application that helps optimize any type of asset portfolio. The app works just as well in the medium-term (to determine coverage strategies) as in the short-term (to manage assets). Its advanced optimization features help devise high-quality strategies, for example, by responding extremely rapidly to requests for studies of investment projects.

THE TEAM

Dimitri TROMANOS, Emmanuel CANON,
Mélodie Mouffe, Eric DE CALUWÉ,
Augustin BATAILLE

507 // NewCorp

ADVANCED METHODOLOGY TO RESPOND TO PUBLIC AUCTIONS FOR POWER TRANSMISSION LINE CONCESSIONS

Over the last 16 years, the Brazilian energy regulator has auctioned off 50,000 km of 230 to 800 kV transmission lines. We created a new method to address the dual challenge of short bid submission deadlines and the costs of preparation of applications. Our solution involves partners upstream, optimizes special engineering solutions, and uses a dozen or so recurrent, predefined parameters. The methodology has been in use since 2007 and has helped increase the value generated by contracts by an average of 30 %.

THE TEAM

Hudson WAGNER CAETANO DA SILVA, João Paulo PEREIRA ROSSELIS E SILVA, Pedro Henrique SOARES VILELA, Clarkson Henrique MELGAÇO MARQUES SILVA

465 // Tractebel

EFFIRENOV

EFFIRENOV is a comprehensive contract for committing to energy renovations. The program uses 3 levers: building renovation work, a financing plan in partnership with a mortgage bank, and an operator agreement throughout the term of the contract, with an agreement to save energy. ENGIE Cofely relied on assistance from a prestigious finance partner in the private residence market. The collaboration between operator and financial backer is one of the strengths of this comprehensive product.

THE TEAM

Aurora DU RUSQUEC, Laurence GAUDET, Danièle BERENBACH Laurent DANDRIEUX, Emeric DE FOURNAS, Joël TAILLARDAS, Erika DRAGONE, Pierre-Yves EON, Karine LEBOURG

473 // France B2B



ISO INTERACT

The energy transition takes place through different ways in which homes can be improved. ENGIE's independent specialist partners (e.g., HVAC specialists, plumbers, electricians, after-sales service technicians and window-makers) can now offer additional insulation products to their customers via a web portal. An ENGIE partner that makes cellulose insulation has a national network of eco-friendly certified insulators who install the insulation.

THE TEAM

Franck BARTOLOMEI, Patrick PELLEGRINI

547 // France B2C

EFFIPAD BÂTI

Renovating buildings contributes to the energy transition however, the market for it has stalled in France. EffiPad Bâti is ENGIE's first tool for spurring co-owners and social housing landlords into taking action. The app, available on iPad for site measurements, is combined with a team-based extranet to help generate, in less than 3 days, a commercial proposal for renovating a building.

THE TEAM

Sophie THEVENON, Fabrice WILLAY, Charles-Emile HUBERT, Alain JOLY

357 // France B2B



Commercial Use of Sugarcane Straw for Power Generation

Business partnership between Tractebel Energia and three other companies to develop the use of sugarcane straw in order to increase bioelectricity generation.

Brazil is the world's largest sugarcane producer (634 million tons in 2014/15). Because the Brazilian Government prohibited burning of the straw in fields and promoted harvest mechanization, a new market for the recovery of straw emerged.

In 2013, Tractebel acquired the company Ferrari Termo, owner of a 65.5 MW sugarcane bagasse cogeneration plant (the fibrous by-product of sugarcane left after the extraction of the juice) and identified the possibility to expand & retrofit this plant to 80.5 MW using sugarcane straw mixed with bagasse at a commercial scale for power generation.

In 2015, the sugarcane straw represented 7% of the total biomass consumed in the plant. In 2016, it should represent 16%.



THE TEAM

Guilherme SLOVINSKI FERRARI,
Claudine FURTADO ANCHITE, Cristian DANIEL
GABIATTI, Diego MACHADO SILVEIRA

512 // Brazil

Wobbeurope

An offering based on technology owned by ENGIE, built around a synergy of several BUs which aims to optimize production in industrial operations sensitive to changes in natural gas characteristics.

Based on technology developed by ENGIE research center, this "all inclusive" maintenance lease offering helps industrial operations to overcome fluctuations in natural gas characteristics. The benefits offered cover three main areas: energy savings, reduced scrap and reduced maintenance activity.

THE TEAM

Laurent LANTOINE,
Jean-Christophe TOUREL,
Gérald DEHON,
Thierry PRUNIER-
COLLEUC,
Dominique GOSSELIN

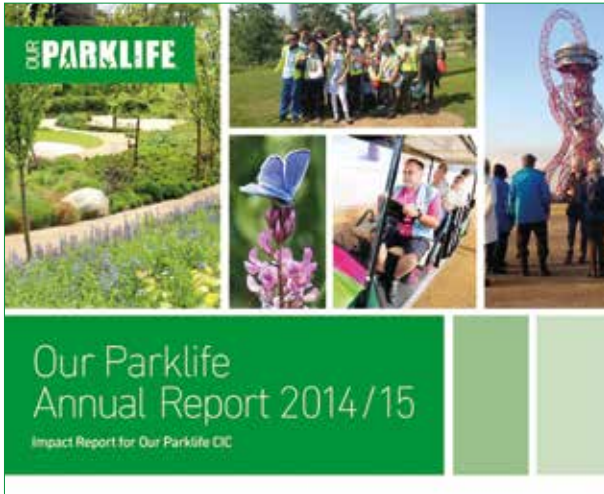
275 // NewCorp



Our Parklife

A cross-sector collaboration model and a pilot for strengthening the implication of local communities and improving the social dimension of Facility Management.

In 2014, ENGIE partnered with 3 other companies to create a Community Interest Company: Our Parklife. The aim was, through the management of a park, to increase the wellbeing and financial independence of East-London residents and as a result, help to regenerate one of the poorest areas in the UK.



Of the people working on the park, 50 were previously unemployed. Also, nearly 60% were from minority ethnic backgrounds, 35% were women and just under 10% had a disability.

Over 260 volunteers helped on the park in 2015; 126 were 'core' volunteers who undertook over 20 hours a week. The value to the local economy was estimated at £1.3m.

THE TEAM

Rowan LONGHURST,
Adele LEFEBVRE,
Stephen JACKSON,
Ian MONTEATH

392 // UK



CSR : A DISTINCTIVE APPROACH FOR ENGIE

ENGIE Cofely has built a method to better meet its customers' social and environmental challenges from the very beginning. A partnership and comprehensive response encompassing all ENGIE's solutions can then be proposed. This distinctive approach uses multiple internal CSR and management resources.

THE TEAM

Angélique MENNESSIEZ,
Etienne VOGT,
Dominique GOSSELIN,
Nadjma AHAMADA,
Charles-Antoine CRUYSMANS,
Olga OLIVETI SELMI

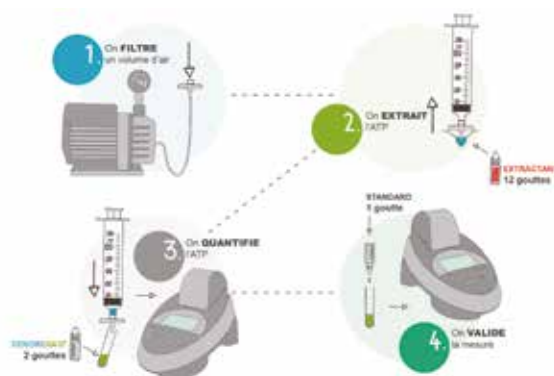
446 // France B2B

ATP-metry for indoor air

Guaranteeing greater health and safety via an instant aerobiocontamination quantification technique for indoor environments.

Analysis of total air flora are traditionally performed in the laboratory via Petri dish culture. This technique is discriminant for certain flora and therefore does not fully represent the reality. It is also slow: results are only available between 2 and 7 days after collection.

The ATP-metry technique (a rapid microbial flora detection method) has been the subject of extensive research conducted with a startup for use in air, and today allows the consideration of new applications for Group activities in medical facilities and luxury hotels. It is a method that can be used on-site as well, and is rapid: results are available in 20 minutes.



Through guaranteeing traceability for indoor air quality with instant flora monitoring, ENGIE Cofely can offer significant added value to its customers.

THE TEAM

Priscilla PETINGA, Marie-Eve GSTALDER, Nathalie ROUSSEL, Sandrine VILON, Stéphane GROUT, Romain PFAENDER

481 //

France B2B

ENGIE Sigfox Ready

A very economical digital supply solution opening doors to new performance and comfort markets for ENGIE and its clients.

ENGIE's clients wish to have a portal for "Smart Metering," for use in the intelligent tracking of their assets' energy consumption. Vertuoz Monitoring's offer already meets their demand. However, the cost price for the conventional data acquisition, transport and processing technologies is still too high.

Thanks to Sigfox, a low-throughput, long-range radio communications operator offering innovative technology at very affordable prices, the ENGIE Sigfox Ready offering is 2-3 times cheaper than the conventional solutions thanks to negotiated prices on devices and subscriptions. An open solution - connected objects and the Sigfox operator being independent actors on the market - it is also simple and quick to implement.

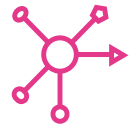
The first results are in: business renegotiations facilitated, early signatures on new "smart metering" contracts.

THE TEAM

Hervé BIDOU,
Philippe GARCIA,
Igor PERRET,
Vincent RENAUD

218 // France B2B

INTEGRATED OFFERINGS



Sapphire Energy Solutions

Guiding large industrial customers through the energy transition by realizing end-to-end solutions for on-site energy efficiency including financing.

THE TEAM

Bob VAN SCHOOR,
Harrie BLONDEEL,
Marc DE COCK,
Peter AERTS,
Arthur MEERSMAN

502 //

Generation Europe

Large industrials want to maintain their competitive position by being early adopters of the energy transition. They need know-how, human resources and financial resources. Furthermore, in Flanders, regulations oblige them to invest in energy efficiency projects.

ENGIE has the capabilities to offer end-to-end solutions for energy efficiency, including study, engineering, procurement, construction, operation, maintenance, and financing. After setting up a dedicated Special Purpose Vehicles (SPV), all contributing ENGIE's BUs will be involved as preferred bidder (market conform) hence demonstrating ENGIE's unique multi-competence value propositions.

Several members of industry in Europe have shown interest in this solution, and the first contracts should be signed before the end of 2016.



COMMERCIAL SYNERGIES BETWEEN ENGIE SPAIN AND AQUALOGY

ENGIE reached an agreement with SUEZ to use Aqualogy sales forces in Spain to test a small B2B segment for power and gas supply. Additional training sessions were set for Aqualogy teams to help them develop their knowledge of the power and gas markets. Customer feedback was positive thanks to our comprehensive service which differentiated us from competitors. This pioneering program in the sharing of sales forces opened an alternative path in the search for new market opportunities with limited investment.

THE TEAM

Eduardo NEGUERUELA, Fernando GONZALEZ,
Paula PIERNAS, Antonio PUEBLA

426 // NECST



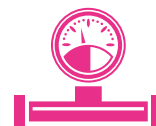
FULL OUTSOURCING PARTNERSHIP WITH COVESTRO

Chemical companies Covestro and Lanxess, shared an industrial site in Antwerp (Belgium) since 2004. In 2015, they decided to go for separate steam supply installations. Covestro signed a 10 year full outsourcing partnership with ENGIE based on O&M on their steam supply installations combined with a competitive priced steam coming from ENGIE's CHP and the valorization of Covestro process waste streams (bisphenol A).

THE TEAM

Manu STRUYVEN, Bregt VERSCHUERE,
Frederik HOFMAN, Davy ARNOUITS

445 // Generation Europe



PIONEER IN LNG PORTFOLIO OPTIMIZATION SERVICES

In 2015 ENGIE and Kansai Electric, the second biggest producer of electricity in Japan, signed the first agreement for services to optimize Liquefied Natural Gas (LNG) portfolios. The incorporation of third-party assets will significantly increase ENGIE's capacity for maximizing the value of its own portfolio through diversification, optimization and monetizing its regasification costs in Europe. This kind of partnership is unusual in the LNG industry. Kansai Electric and ENGIE will divide profits equally.

THE TEAM

Michael WICKLUND, Mathieu BROVELLI, Anna KIRK

262 // Global LNG



A NEW OFFERING FOR STORING LARGE VOLUMES OF LNG

Membrane storage technology installs insulation directly in ships' structures, which is faster and more cost-effective than previous solutions. It allows savings on weight and space that are particularly useful for increasing the powered LNG fleet. Membrane technology is relatively inexpensive and particularly well suited to large storage units. It creates the possibility of a new LNG storage offering for new structures, and retro-fitting for existing ships.

THE TEAM

Pierre KRAEUTLER, Dominique PASCAL, Laurent KADOUR, Jonathan STRACHE

110 // France B2B

Enhancing the Customer Experience

Commercial and Customer Relations.

05





Digitization of the door-to-door sales channel

Establishment of a digital ecosystem for door-to-door sales to professionals.

THE TEAM

Carole BENSOUSSAN,
Chantal ALARIO,
Romain LEBAS,
Nicolas CASTELLI

114 // France B2C

The Corporate Customers Division (DMPR) was created at the end of 2014 to address the professional customers' segment, which uses on average 3 to 4 more natural gas than individual customers.

Professional customers prefer face-to-face contacts. The door-to-door channel was selected of the most promising. The DMPR therefore organized a team of 220 external salesforce, and, to secure both volume and quality of sales, implemented a third generation Digital Platform (big data + machine learning + apps allowing a comprehensive digitalization of sales processes: training, tracking, digital signature, sales monitoring, reporting, payment).

The collaboration platform helps to foster a culture of openness and trust. The general transition to digital sales was completed in June 2015.

After less than a year in existence, the following key results have been observed:

- +250% in electricity contract sales;
- 30% decrease in customer acquisition costs;
- 30% reduction in back office processing costs.



BLEND AND EXTEND

Blend and Extend is an advanced contract renewal mechanism allowing customers to benefit from lower market prices earlier than they would with a standard contract renewal. It also has the added benefit of smoothing out cash-flow, supporting customers' financial health. Added value reporting allows them to capitalize on favorable market variation which they may otherwise have missed. Fixed price customers are typically SMEs with limited resources for managing energy supply.

THE TEAM

Maryline PINEAU, Pieter JOUBERT,
Angela CUFFE

207 // UK



TOUCH-E REVOLUTIONIZES CUSTOMER COMMUNICATION

The sales team at the ENGIE Cofely Savoie-Dauphiné office in France has developed Touch-e, a personalizable iBook available on iPads, to revolutionize communication with our customers. This digital tool is fully customer focused and supports our sales pitch and prospection work. It enhances our verbal presentations and strengthens our customer portfolio. Two areas have been identified as strong points and have been the subject of special focus: belonging to a large Group and customer proximity.

THE TEAM

Alexandra HATOT VIVET, Anthony SINTES,
Nathalie MARTIN, Laurence DEVILLERS

186 // France B2B



INSTANT SATISFACTION SURVEY

A new management of customer satisfaction has been implemented by **ENGIE Home Services**, placing the customer's voice at the heart of its concerns through a satisfaction survey after each intervention. The systematic survey is monitored by the Net Promoter Score and carried out by SMS or e-mail a few hours after the intervention.

THE TEAM

Olivier PETITPAS, Christophe CHARRÉ

267 // France B2C



VOX

A web platform for service evaluation, for organizations that want to develop a customer-orientated culture for their users. VOX offers a decompartmentalized and transparent satisfaction index in real time for each service. As an extra option: an evaluation of that day's mood measures possible correlations between customer experiences and what leads them to visit (or come back to) the platform. Involving customers in this way enables them to assess the services they receive.

THE TEAM

Frédéric PORQUET, Bruno SANCHEZ, Emmanuel PIGNOT

517 // France B2C



Speech Analytics

Providing advanced functionality to improve customer relations by collecting valuable intelligence from customer calls.

Call centers are the main channels of information between ENGIE Italy and its customers. To support the operational management, a new analytics tool was needed to analyze and extract insights based on customers' calls in order to improve and personalize customer service.

Speech Analytics Solutions can mine recorded customer interactions to pinpoint cost drivers, trends, and opportunities, identify strengths and weaknesses helping ENGIE understand how the marketplace perceives its offer.

THE TEAM

Antonella DELL'AQUILA, Michele MANCINI, Antonino ESPOSITO

256 // NECST



Customized interactive video

A personalized interactive video helps us establish a privileged relationship with customers and stand out from the competition.

Video is a particularly relevant medium as part of "self-care" and digitalizing customer relations, relying notably on data specific to the customer. With a previously-defined template as a base, each customer views a personalized video relevant to the situation.

Two experiments are in progress:

- Explaining the customer's own bill via video.

Objective: Reduce incoming calls about the start of service bill by 10%.

- Build loyalty among premium customers during the welcoming phase

Objective: Reduce the attrition rate by 40% during this phase.

THE TEAM

Gaëlle ANTONIO, Jean-Remy DUDRAGNE, Cédric CASTAGNE, Jean-François PHILIPPE

403 // France B2C



Residential Clients Invoice as a publicity channel for third Parties

Implementation of an advertisement service to cover the cost of sending invoices and to generate new revenues.

THE TEAM

Marco Antonio ORTEGA CONTRERAS,
Marianna DE ITA,
Jesús OLVERA,
Norma SANTILLÁN

342 //
Latin America

As per Mexican regulations, ENGIE Mexico is obliged to deliver a physical invoice to all of its clients. The expense of printing the invoices amounted to USD 85,000. The team realised that specific segments of their customer base receive invoices at their home address, and then keep their invoices in their records for long periods of time. This quickly made the invoices themselves an interesting vehicle for local advertisers.

Each month, ENGIE Mexico sells spaces on the back cover of its invoices. The approach gives customers enough flexibility to change every month according to demand and seasonality.



In 2015, the additional revenues generated through the implementation of the advertising programme allowed ENGIE Mexico to cover almost all of its invoicing costs (93%).



ENGIEMOBILE.RO - ALWAYS ON THE MOVE

In 2015 engiemobile.ro was launched, completing customers' experience with a helpful mobile app and positioning ENGIE Romania as a major digital player within the energy industry. The app offers high quality real-time data, creating peace of mind for clients and playing an important role in their perception of ENGIE. It includes a wide range of functions, such as: online payment, meter reading transmission, gas emergency call numbers, safety tips and invoice history, plus consumption graphics for the last three years.

THE TEAM

Laurentiu GAVA, Horatiu MINCA,
Cristian DOBREANU, Alexandru UNGUREANU,
Valentina GEORGESCU

415 // Generation Europe

THE SHOWROOM: CONNECTED CITIES AND REGIONS

The showroom recreates and stages a urban decor, with street lights, cameras, electric charging points, eco-districts and even a supervision center. The touch-screen table is the central feature around which this interactive setting revolves. Large-scale screening of motion pictures creates a wall of images and takes us into the heart of the connected city.

THE TEAM

Charlotte PAREJA

053 // France B2B



Personalising clients' user experience thanks to Big Data!

Building loyalty, attracting new customers, prompting upgrades and digitising customer services through Big Data.

In France, ENGIE's residential customers expect sales offers from the Group that are adapted to life-changing moments (moving house, renovations, etc.). The Data Management Platform (DMP) allows for a relevant, ethical, and reasoned sales approach. For the customer, sales offers are only received at these "life changing moments", taking into account their preferred communication channel (email, SMS, telephone) and when they are not opposed to sales messages.

How? By correlating data on visitors' browsing behavior with their customer/prospect CRM profile via a DMP. Results are positive, more customers are acquired (4.5 million in the stipulated life moments) and sales have multiplied threefold.



THE TEAM

David LEGENDRE,
Céline REGNAULT

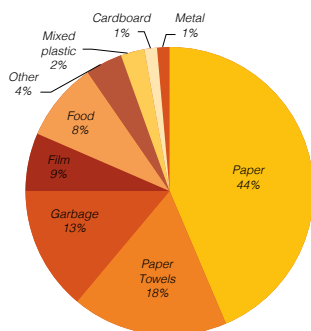
471 //

France B2C

The Garbage Whisperers

Through innovative waste characterizations, Ecova is helping its clients move toward zero waste through data, insight, and action.

Waste composition by Weight



Almost everything ENGIE's U.S. subsidiary Ecova's clients do generates waste. That waste tells a detailed story – from how their business is doing to the success of their recycling programmes. Ecova has developed its waste classifications and offers consulting services that take the client's client's unique systems and goals into account.

This approach turns data into insight and action. 60% of the clients Ecova worked with in 2015 signed more contracts to expand their projects. Based on the team relationships

with these clients, Ecova anticipates that number to grow by 100% in 2016.

THE TEAM

Kristin KINDER,
Arnold BOWERS

568 //

North America

Boosting Performance

Management Excellence.

06





Pro Bono Volunteer Program

THE TEAM

Eftal EFEÇİNAR,
Elif ÖZTÜRK

356 // MESCAT



A volunteer program open to all ENGIE Turkey employees and which aims to maximize stakeholder engagement.

ENGIE Turkey was looking for a different, engaging way of developing the skills of its employees. It decided to capitalize on the solid corporate social responsibility programs that the company had built up over the years. This led to the creation of Pro Bono, a volunteer program that allows employees to invest time in NGOs in need of professional help, creating an opportunity for employees to strengthen their existing skills and develop new ones.

Pro Bono puts ENGIE's (internal and external) stakeholders and their desires (e.g., local recognition, reputation, management culture, personal development) at the heart of the program and creates a win-win situation for all stakeholders involved.



ENGIE HOME SERVICES AND BOILERS FOR A CAUSE

In winter of 2014-2015, we formed a partnership with the non-profit association *Noël Heureux Avec Eux*. The association received €5 for every quote for installing a new boiler and €30 for each boiler sold. The partnership fulfilled three objectives: it grew our sales, brought our teams closer together by putting them on a regional project that contributed to our social and managerial goals, and spread the association's message, strengthening our employees' pride and sense of belonging.

THE TEAM

Antoine SCANU, Aurore SCUDERIN, Mathieu WARME, Eric BARLON

549 // France B2C



REPORTING AND RESOLVING HAZARDOUS SITUATIONS AT CUSTOMER SITES

A mobile app that lets staff with smartphones and tablets record and resolve hazardous situations. Reporting information to site managers and to the Internal Prevention and Protection Department (SIPP) at worksites allows the situations to be analyzed and action to be taken to attain the end goal of zero accidents at ENGIE Cofely. The solution is accompanied by a new service: Whenever a hazardous situation is detected, the customer is offered an immediate safety resolution to the problem.

THE TEAM

Jacques TILQUIN, Isabel LILLYWHITE, Ludovic LEGROS, Benoit STANUS

216 // BENELUX



A pilot wastewater plant in the heart of the Sahara desert

Building a low-tech, low-cost pilot wastewater treatment plant in a south Algerian village as part of ENGIE's Environmental and Social Responsibility program, alongside the Touat project.

In most oasis villages, wastewater is dumped directly into palm groves without treatment, threatening the fragile ecosystem and causing health concerns for residents. This project allowed us to test an eco-friendly, low-cost technology suited to the local area around the village of M'Raguen (800 residents) in the Algerian Sahara, near the Touat project. The 100% organic treatment plant filters and purifies wastewater through a reed plantation (vertical flux percolation). It can be built fast by local artisans and is inexpensive and

easy to maintain. The project is a first in the region for the Group and demonstrates ENGIE's commitment to the environment and to local stakeholders (hiring of locals and skill transfers).



THE TEAM

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531 // EPI



Composting biomass ashes

The use of biomass combustion ash as a catalyst helped popularize a mini eco-composting unit, allowing anybody to recycle organic waste and turn it into compost.

The 160,000 inhabitants of Lages (Santa Catarina, Brazil) produce 30 metric tons of organic waste daily, which is usually sent to municipal landfills, generating high costs and negative environmental impact. In 2014, the mini eco-composting project was launched by a team of teachers and technicians from local public and private institutions. The main goal was to teach inhabitants to sort waste more effectively and compost 100% of organic waste at

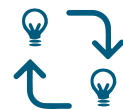
home. Biomass combustion ashes from the UCLA unit were the perfect catalyst to help waste decompose properly. More than 100 schools participated in the project over two years, and more than 70% of them are still using their mini eco-composting units. Seven to ten thousand households have adopted the technology, raising the percentage of residents that compost their organic waste to 32%.

THE TEAM

Mario WILSON CUSATIS,
José Luiz DOS SANTOS
DUTRA

500 // Brazil





Knowledge Management

An innovative Knowledge Management (KM) approach in 12 pragmatic projects that help develop Storengy's assets in a environment of specialized expertise.

The ISO 9001 (2015 version) quality management standard requires us to determine the knowledge needed in our processes, keep them up to date, make them available, and then determine ways to acquire additional necessary knowledge—all by 2016-2017. A structured KM approach adapted to the field and enriched with over 50 years of experience is therefore vital.

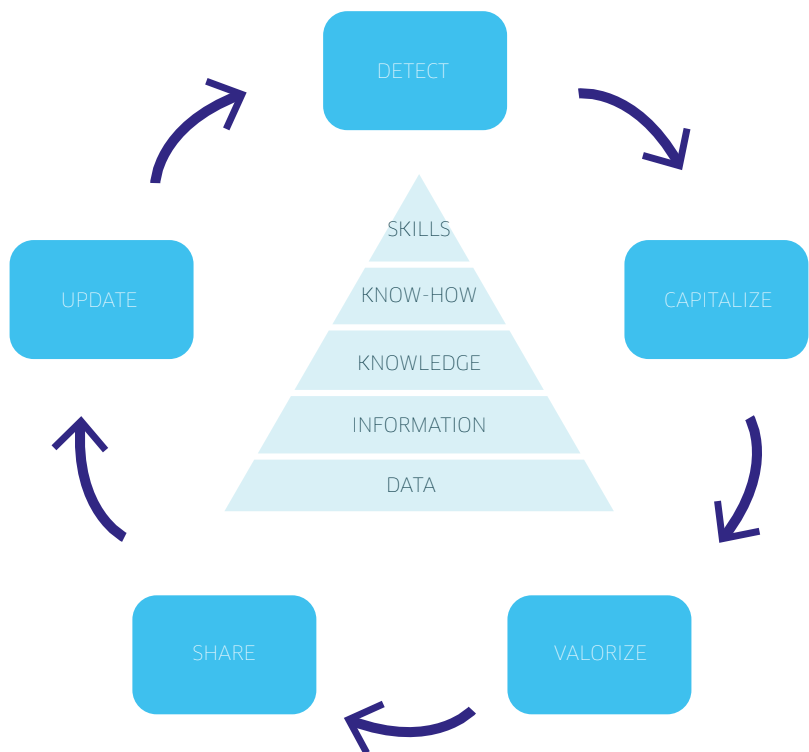
Twelve different projects were implemented, ranging in topic from skills (their acquisition, development and transfer) and career paths to training, industry monitoring, and collective digital tools.

The results have been tangible in the team's production, with improved responsiveness, team spirit, relationships, and use of expertise.

THE TEAM

Eric CHAUDAN,
Alain QUINQUENEAU,
Bathilde BAZILIQUE,
Brigitte COUTOULY

081 // Storengy





REFERENCES: AN INTERNAL PLATFORM TO ACCELERATE OUR SALES

References is a participatory platform whose mission is to promote the sharing of commercial successes throughout the Group. The platform is easy to use and available in six languages. It is the first comprehensive archive of all of the agreements we have signed with our customers around the world in all fields of expertise. References helps us submit better tenders to requests for proposal. The tool also evolves constantly to meet users' needs and adapt to internal changes at ENGIE.

THE TEAM

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Linda SADASSIVAME, Dimitri BAK,
Charlotte PAREJA, Matthieu TERRIS

399 // NewCorp



K-PRATI.C

K-Prati.C is a record of employee expertise and skills. The data is collected using online questionnaires and practical scenarios. K-Prati.C is a fun, innovative, easy-to-use web platform for employees, managers, and HR staff. It was created in-house and fulfills customers needs. Now, employee skills can be searched for easily and a Skills Passport can be issued to attest to an individual's expertise. The platform can even be used to form a mapping.

THE TEAM

Caroline VECCHIONE, Laurie MAUREL,
Claire CHARRIER, Grégoire JOUTEAU

113 // France B2B



TE-REX

Te-REX is an independent solution that collects feedback on experiences, makes the feedback easy to view, and provides structured management of the most relevant experiences. It is a web tool that provides information to any employee connected to the intranet. The interface of REX is standardized, with required and optional fields that allow for flexible searches, the ability to search by randomly selected words in the main fields, and multiple search possibilities for the needs of every type of user.

THE TEAM

Kris BOLLENS, Jeroen VERSTRAETE

454 // Tractebel

Partnership with the North Tyneside Council

How robotic process automation improved performance, staff expertise, and customer service.

THE TEAM
Mike HEDGES,
Gail ARKLE,
Martin RUANE

318 // UK

In 2012, ENGIE signed a 10-year partnership agreement with the North Tyneside Council in the UK. In 2014, the partnership became the first to introduce robotic process automation (RPA), a low-cost, rapid transformational tool that created the first (and only) virtual back office for a British council, and the very first robotic end to end benefits claims process.

In March 2016, the ENGIE UK/North Tyneside partnership team completed the automation of proof-of-concept processes for a variety of tasks, including payroll, benefits, HR transactions, and accounting transactions.

Now, 87% of new requests for benefit claims are handled online, reducing processing times by 50%. Over 91% of customers find the online request form to be easy to use.

Argoia

A digital platform for managing the time and location of tasks.

The number of maintenance operations performed on industrial processes is always increasing, while deadlines become ever-shorter. With the rising number of contractors on site, simply relying on a coordination and prevention plan is not enough, resulting in accidents and unmet schedules.

THE TEAM
Sylvain SOUCHER,
Maxime MORO,
Romain NOYER

190 // France B2B

Enter Argoia, a digital management platform for shared activities, which can be used for any of ENGIE's services. The platform automatically identifies activities that take place in the same area at the same time.

Updated daily, its dynamic calculation helps organize site meetings and share information efficiently.

Argoia also allows parties to a contract to identify shared activities in order to better evaluate risk, thus improving safety for those working on site.



PROJET VEO

The VEO project has turned the relocation of 600 Nantes employees working at ENGIE Axima into an opportunity to transform their quality of life at work. In addition to a new, low-consumption office downtown, the project promotes eco-friendly commutes for employees, helps ensure considerations for handicapped workers, opens the company up towards the public with a Family Day, and oversees a more- sustainable waste management process.

THE TEAM

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312 // France B2B

DYNAMIC WORKSPACES

An adapted workspace for every work scenario. Following an analysis of workspace usage, ENGIE IT rolled out a dynamic workspace layout at a pilot site. To improve well-being at work, workspaces were designed and arranged with input from employees, who were involved in all phases of the project.

THE TEAM

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469 // NewCorp

A NEW WAY TO WORK

The goal of this initiative was to drive new practices at work and provide employees with workspace arrangements that promote efficiency and teamwork. The hierarchical model of organizational methods is falling by the wayside. Today, emerging managerial models suggest the behavior of leaders is changing: instead of driving their teams, they are now leading and serving them. Launched in 2014, the program has helped employees become more flexible and involved in their work, boosting performance thanks to the creation of dynamic workspaces and experimenting remote work. 70% of the 200 employees who participated in the program approved of it, notably because of its innovative nature.

THE TEAM

Olivier GHIENNE, Olivier GOSSET, Léa THONAT, Yves RENIE, Rémy CHRISTOPHE, Nadjma AHAMADA, Nicolas HERCHIN

373 // NewCorp

Impulse

A collaborative approach to set up the company strategy.

The launch of a new company project involving ENGIE Cofely and Entreprises & Collectivités (E&C) was announced to the employees of the two entities in summer 2015.

ENGIE Cofely solicited feedback, via the website impulse2015.fr, from as many ENGIE Cofely and E&C employees as possible in order to develop engagement in the project.

It is a new way of looking at company strategy: a structured, 100% bottom-up approach that successfully combines digital resources with traditional physical interactions.

In just 100 days, Impulse recorded more than 16,800 logins creating an atmosphere of discussion and sharing within the two entities. The 834 suggestions collected on the platform helped flesh out topics and served as a foundation for the new ENGIE Cofely 2020 company project: "ENGIE Cofely, the natural builder of solutions and energy for our customers."

THE TEAM

Christophe THIL, Judith JIGUET, Charlotte PEREIRA,
Tania BRAUMAN

499 //

France B2B

CHANGE AGENT PROJECT BY ENGIE ITALY

In the current environment of continual change and reorganization, HR teams are faced with numerous challenges. Our "by people for people" management approach consists of understanding and addressing organizational changes. To get everyone on board, a network of trained employees was created to spread a culture of change within the organization. The object was to bridge the gap between companies and to create an environment that welcomes change with open arms.

THE TEAM

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Paola MORI, Claudia PULEO, Valentina BRESCIANI

089 // NECST

CIRCLE OF INNOVATION AND INVENTORS GENERATION

Two complementary programs launched in 2015 helped uncover and develop a large number of innovations for high-stake contracts. Coaching was provided for 60 innovation managers, making it the first project of this scale. As part of the project organizational silos were broken down, technological support was provided and “employee inventors” were celebrated.

THE TEAM

Vincent CHAUVIN, Isabelle FONDIMARE

088 // France B2B

Do Innovation Yourself program

Breaking down the barriers to the adoption of digital practices by allowing employees to prototype their own innovative ideas.

The biggest obstacle in collaborative innovation is the leap from an abstract idea to a physical creation.

The Do Innovation Yourself (DIY) program was formulated as a challenge to allow employees to submit an idea and, then, design the prototype themselves.

DIY has already run for two “seasons” since January 2015:

- The first DIY aimed to build a smart device using an Arduino microcontroller: 32 projects were submitted.
- DIYToo aimed to design a mobile app using the KONY development tool Mony: 105 teams participated.

The project team assisted competing teams by sharing relevant information with them (technical know-how, user experience, business model development, ideas pitches ...).

THE TEAM

Olivier SERVOISE,
Jean-Claude ZEIFMAN,
Lucile HOFMAN

576 // NewCorp



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