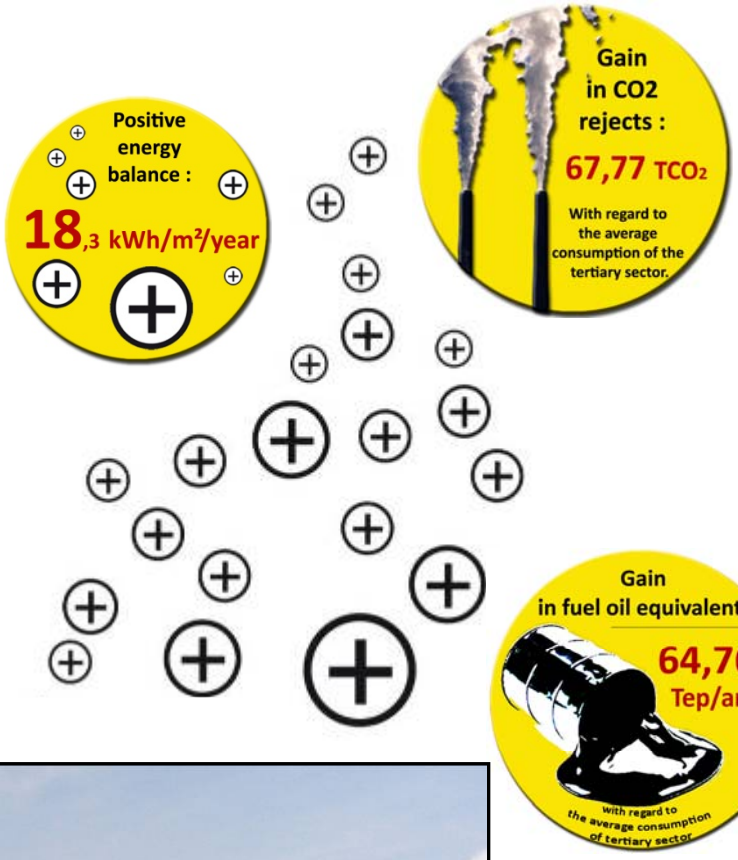
ABALONE énergie

www.abalone-energie.com



Informative Booklet of the future ABALONE head office

THE autonomous **positive energy and zero pollution** building **with** its own energetic network…

A unique energetic mix.

Last version

April 2010

ZOOM ON...

François-Xavier MOUTEL, CEO of ABALONE Group:

Ex regional director of a large temporary work company;

ABALONE founder in 1991;

Recognized by his peers, elected member of at the chamber of commerce of Saint-Nazaire from 2001 till 2004;

Ex vice-president of the Companies Creator's club of Pays de la Loire;

Member co-founder of the "Mission Hydrogène".

Territorial dynamics and customer satisfaction are the major axes of his development policy.

EDITORIAL

Bet on the intelligence of the world

"The creation of this new concept autonomous positive energy building brings about a lot of questioning.

At the time when everyone considers the issues of sustainable development and the future of our children, the dream which I put so much time to concretize succeeds finally.

To achieve this aim, I have bet on human intelligence. Stating from a simple idea was born a merger of skills and a network that has enabled the development and successful completion of the project.

This building is designed to ultimately be a heart of advanced technology and exchanges, involving adequate work and comfort space. Precursor and unique, it combines unpublished technologies such as hydrogen and fuel cells, together with a mixed efficient energetic solution: solar, photovoltaic, solar thermal, wind turbine and Canadian well.

It answers exactly to the issues of energy cost control, because, even that there is evidence that there will be an increase in energy costs, taking into account this factor, will mobilize considerable human and financial resources in the futures decades. It will be eventually fully autonomous and will operate independently of the national electricity network for better cost control and total independence. We privilege immediate consumption rather than resale.

It is fundamental for me to explain the issues related to the creation of this building so that this concept becomes attractive and transparent to all. The aim of this booklet is to answer and explain the key concepts of the building. It addresses as well the regional and industrial actors, the political and local authorities, but also the public in general and to everyone concerned by the future of our planet.

The tribe working for success is on the right way for employment and a sustainable future.

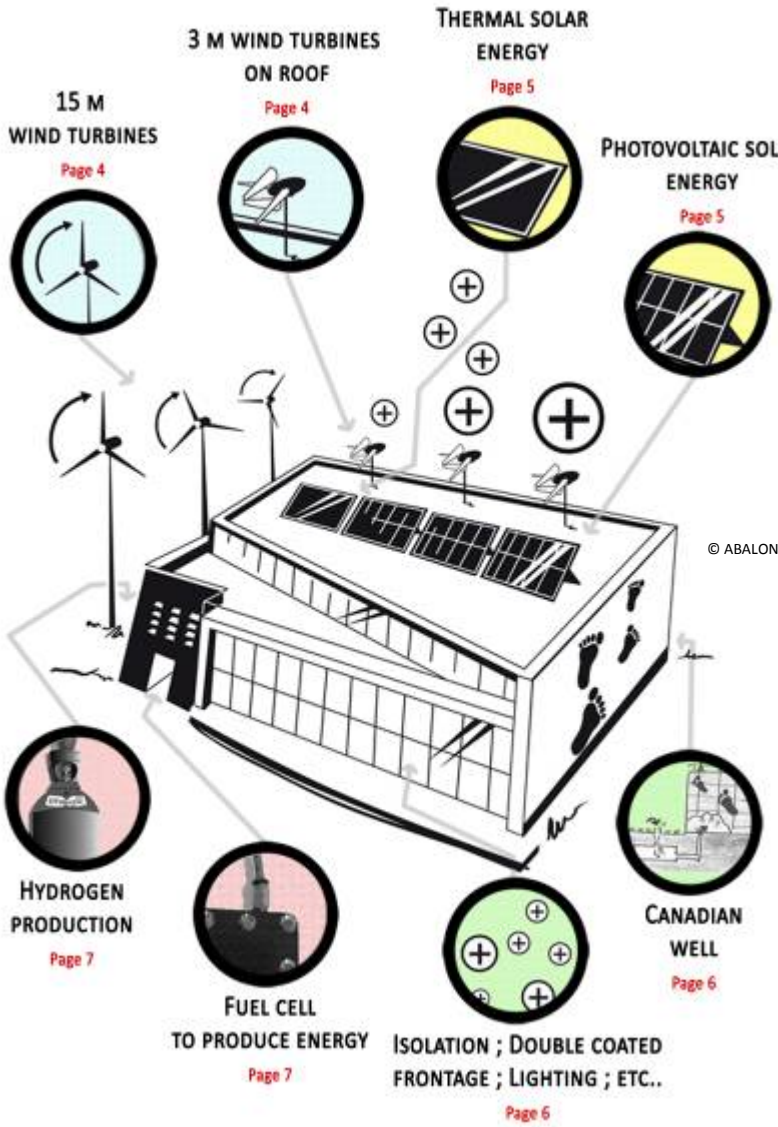
François-Xavier Moutel

CEO ABALONE Group

A PRECURSOR ARCHITECTURAL PROJECT

- **The place:** situated in the Lorie's urban development zone in Saint-Herblain, secondary road 201 between Vannes and Nantes, the project extends over a net surface of 1320 m² net gross floor area.
- **The concept:** this building groups together a set of environmental and non polluting solutions, without reject of greenhouse effect gas and its own energetic network. It is a real demonstrator, proving the interest in combining renewable wind and solar energies with hydrogen to reach a total autonomy, without connection in the national electricity network, and reducing our dependence towards fossil energies. A "sustainable development cluster" will be created, the building will accommodate companies in energy and environmental sectors.
- **An exemplary architectural structure:** all the intelligence and functioning of this building rests on an innovative architectural conception. Jean-Luc Cousin, the architect, wished to create a building which defies conventional geometrical rules of construction and which is completely integrated with Earth cycles and seasons. The architectural concept of a compact structure working on inertia allows an optimal functioning of renewable energies and a strong energetic gain.

ABALONE Project in 2006
© ABALONE-JL COUSIN Architecte



© ABALONE-JL COUSIN Architecte
Graphiste C.LAVOIE

Results and objectives… page 8 / Partners… pages 10 / ABALONE Group… page 11

ZOOM ON…

The ABALONE project:

The project was **thought in 2003** and **the construction began in 2006**.

Estimated cost of the project:
4 370 000 euros
Additional cost related to renewable energies: 6,6 %
Additional cost related to Hydrogen: 11 %

The specificity of the project rests on Hydrogen use. The objective is to demonstrate its interest and to incite to develop more this energetic vector.
A visionary and reproducible project by other contractors (no registered patent /all technical informations are available).

ZOOM ON...

The wind energy difficulties:

France is the 2nd European country in wind potential, but only the 5th producer.

The amortization of wind energy is of 10 years, against 7 years for photovoltaic, while the latter is more expensive per KWh produced.

In the case of a small wind energy (< 36 kW) there is no obligation of repurchase by EDF, this requires us to go through another structure.

The surplus energy of wind turbines is acquired at approximately 6 centimes the kWh while photovoltaic energy from panels not integrated to the roof is acquired for 33 centimes and 60 centimes, if integrated, i.e. a factor of 10!

In spite of these brakes, we bet on this energy by combining innovative wind turbines which are going to produce 68,5 % of our energy.

15 METERS WIND TURBINES

- **3 wind turbines of 10 KW** each, of horizontal axis on a **15 meters mast**, will allow to produce **45000 KWh/year**, i.e. **51,4 % of renewable energies total production**.
- The major innovation for these wind turbines is the **"falling over hydraulic" mast** by a system of jacks which will facilitate upkeep and maintenance.
- The produced energy will be reinjected in the building and the surplus will be reintroduced in the national electricity network, while waiting to implement a storage system.
- Later, these wind turbines will also allow us **to produce our own hydrogen** (details p. 7).

© EOLYS Ressources & Energies Society

3 METERS WIND TURBINES

- **3 wind turbines of 3,5 kW each,** of horizontal axis on **a 3 meters mast,** will allow to produce **15 000 kWh/year,** i.e. **17,1 % of renewable energies total production**. **The entire produced energy will be reintroduced in the building.**
- Up till now, only 2 prototypes have been installed in the world. These new generations wind turbines are unique and the building ABALONE thus experiments the national first one.
- Wind turbines easily installed on roofs and terraces with a strengthened robustness which can resist to gusts by capturing a broader spectrum of wind speeds, from 9 to 162 kms/h against 90 kms/h for a classic wind turbine.
- **A better efficiency** than conventional wind turbines of same diameter thanks to its **3 curved pales** capturing the wind by the back. The unique shape of its pales allows to exploit entirely the kinetic energy of the wind for an unequalled production.

© NHEOLIS Society

THERMAL SOLAR

Energy production from thermal solar differs from photovoltaic solar.
Our thermal solar panels will allow the transformation of sun radiations into heat energy to directly use the heat produced. Solar energy is collected by glazed solar collectors, black metallic tubes receive solar radiation to warm a coolant liquid. This thermal power will be used **to warm the building and for warm water for sanitaries.**

PHOTOVOLTAIC SOLAR

© ABALONE-JL COUSIN Architecte-Photo Laurent OUISSE

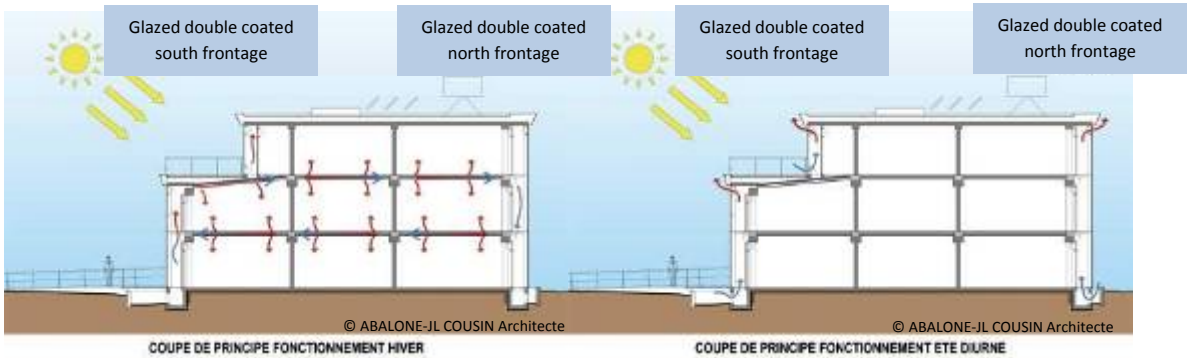
Photovoltaic solar panels are reserved for electric power production.

ABALONE building is equipped with 80 m² of photovoltaic panels which will produce **20000 kWh/year**, i.e. **22,9 %** of the total energy produced .

VARIOUS ENERGY SAVINGS

Recovery of solar gains on the SOUTH frontage and distribution through floors in **hollow slabs or heat evacuation according to season and building temperature.**

External solar protections adapted to orientations.



COUPE DE PRINCIPE FONCTIONNEMENT HIVER

WINTER

COUPE DE PRINCIPE FONCTIONNEMENT ETE DIURNE

SUMMER

Key figures

France receives from the sun 200 times more that its annual energy consumption. **(Source : Institut National de l'Energie Solaire)**

France has reached at the end of year 2008 91 MWc of photovoltaic power, whereas Germany reaches 5351 MWc and Spain 3404 MWc. Total European Union at 27 = 9533 MWc. **(Source: Baromètre EUROBSERV'ER)**

ZOOM ON…

Solar power

It is the most plentiful and most sustainable energy of our planet.

The life expectancy of solar panels overtakes 20 years of operation…

ZOOM ON…

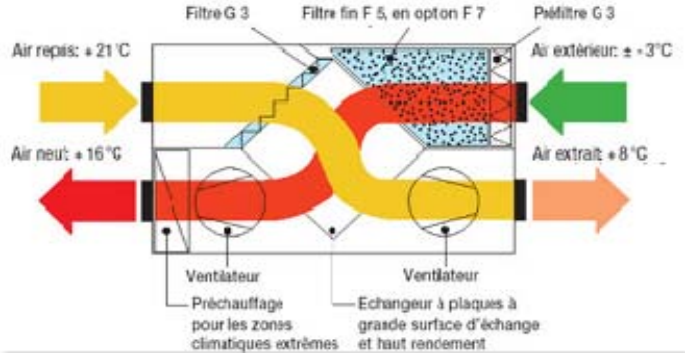
Canadian well + VMC double flow:

A VMC double flow allows to save in the climatic zone H1 (North) approximately 7 500 kWh/year. The Canadian well brings a supplement of 1 600 kWh/year, i.e. 9 100 kWh/year saved.

- **The Canadian well or earth cooling**, so called “Provencal well”, is a **geothermal system** which allows natural air conditioning. It is based on the simple fact that the ground temperature , at approximately 1,50 meter deep, is of 5°c in winter and 15 °c in summer, thus above the ambient temperature in winter and under in summer.

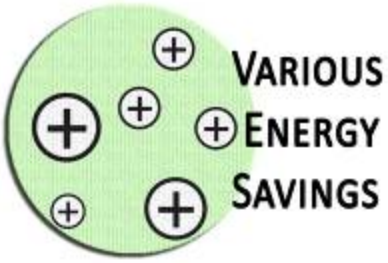
  We use the thermal inertia of the soil to treat the air which will circulate in the building. We thus have a preheating of the hygienic air in winter and refreshment in summer for offices which are not air-conditioned artificially.

- The Canadian well coupled with a high yield thermo-mechanical ventilation (VMC) double flow allows non only the renewal of the air of the building but also the recuperation of heat, in winter, or freshness in summer contained in the air evacuated from the building and to supply it in the intake air. This system thus prevents energy loss for heating or air conditioning.



Operating plan of a VMC double flow (source : ekopedia.org)

© JL.COUSIN Architecte-ABALONE-Photo : Laurent OUISSE



ZOOM ON…

The architecture:

A successful bioclimatic architectural envelope. Optimize the insulation, the inertia and the natural lighting and return to the essential principles of our Earth.

- **Optimization of the envelope** by dynamic thermal simulations,
- **Over-isolated concrete**, no suspended ceiling (very strong thermal inertia),
- **Maximal reduction of thermal bridges**,
- **Glazed frontage with multiple skins** (double + triple glazing) ventilated naturally in summer by openings (cf. photo in margin)
- **Artificial lighting** generated by fluorescent high yield tubes of type T5” in offices and LED for toilets,
- **Individual lighting** generated by **systems of presence detection** and by dimming,
- Drastic reduction of energy consumptions (laptops, nightly surventilation “simple flow”),
- **Re-use of rainwater** for sanitaries.

HYDROGEN... WHY ?

- Today, two solutions exist to store an important quantity of energy: the battery which raises problems of cost and environmental impact and the hydrogen solution. Hydrogen is THE means of electricity storage without reject of CO2 and with a weak environmental impact.

- On a tertiary building for head office use, it is evident that production from renewable energies (wind and solar) will not be totally in concordance with consumption. In other words, during the night, the wind turbines turn while there is no energy consumption, and in the day, consumption proves to be superior than production. Thus, hydrogen appears as the essential means of electricity storage in order to be disconnected to the national electricity network which is our final goal**.**

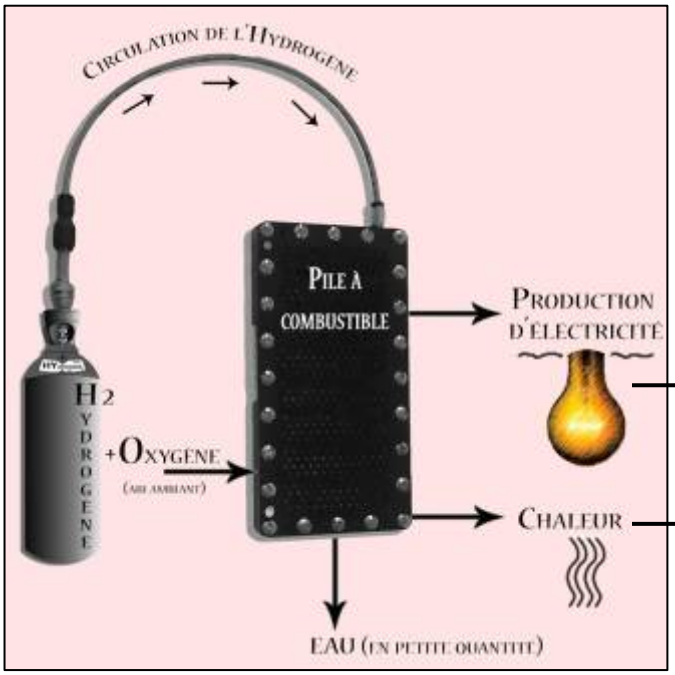
- Hydrogen is a gas obtained from water and electricity by a process called electrolysis. Hydrogen is not an energy, but an energy vector. The goal of the building is to use hydrogen as a means of electrical storage. Renewable energies (wind and solar) will produce hydrogen by electrolysis of water.

FUEL CELL

- This stored hydrogen, combined with oxygen from the ambient air, will be used to make electricity thanks to a fuel cell. The heat of setting will serve for heating, and the electricity to supply the building.

- This technology will allow to assure electrical supply of the building during overdrawn periods (when electricity production by renewable energies is lower than electrical consumption of the building). This explains our why we emphasize on the uniqueness of this project and the aspect of autonomy of the building by the use of hydrogen.

Operating plan of a fuel cell :



Hydrogen production from the wind and solar energies.

© Cabinet C & Cie JL Cousin Architectes

Heating of ABALONE building

ZOOM ON...

Hydrogen:

It is a technology which does not emit CO2. Its production will be obtained from wind turbines and photovoltaic panels.

We are ahead of on our time and the regulatory devices do not allow us to store an important quantity of hydrogen. Thus, we shall produce at the beginning only 7500 kWh /year**.**

ZOOM ON...

Fuel cell:

Its role in the building is to produce electricity from hydrogen which will be produced on site.

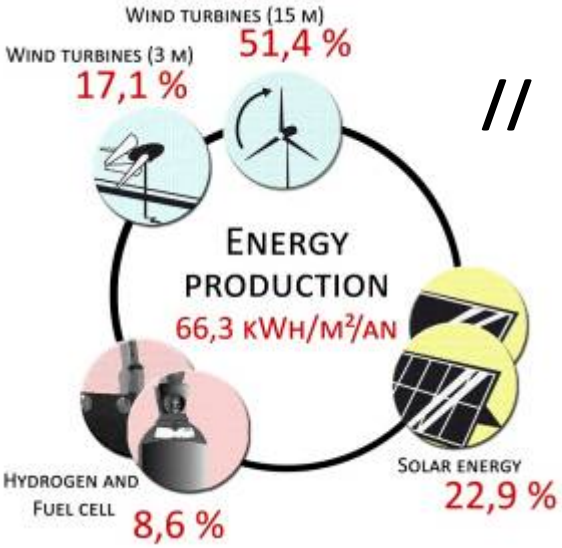
RESULTS AND OBJECTIVES

ZOOM ON…

The French standard: thermal Regulations 2005

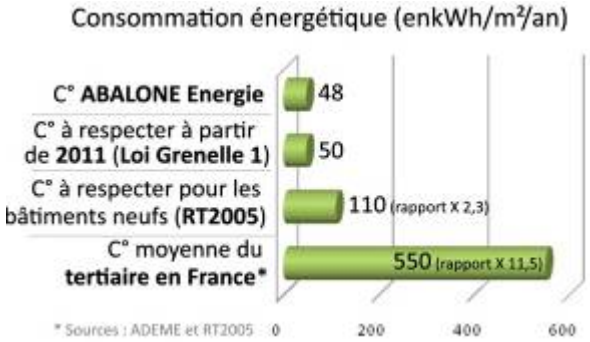
We are more successful 56,4 % and ahead of the RT2005 and the next RT 2012.

The tertiary sector corresponds to 15 % of the energy consumption in France, i.e. 10 % of CO2 emissions. Objective for 2050 (!): decrease by 6 (by m ²) CO2 emissions for the building sector. ABALONE promises from 2010 a reduction of its consumption by 11,5.



//

= POSITIVE ENERGY BALANCE : 18,3 kWh/m²/an



Gain in fuel oil equivalent with regards to the average consumption of the tertiary buildings in France: **64,76 tons fuel oil equivalent**

Gain in CO2 reject with regards to the average consumption of the tertiary buildings in France: **67,77 tons of CO2**

= The tertiary building of tomorrow…

ZOOM ON…

Carbon footprint

The carbon foot print of the electric kWh is different from one country to other according to its mode of power production. For France 1kWh = 0,09 kg of CO2. This rate is low because of the nuclear power, which produces on the other hand other kinds of waste...

The AUTONOMOUS and ZERO POLLUTION building…

… capable of producing energy by means of solar and wind devices. Our aim to be disconnected to the national electricity network, and thus be independant, is possible only by the coupling of renewable energies and hydrogen. The building will produce and store hydrogen so as to generate electricity via a fuel cell.

A DEMONSTRATOR building to be reproduced…

… real showcase of renewable energies, we have managed to combine all the future energies to give birth to a Positive Energy self-sufficient and zero pollution building. Our aim is to make the project known so that other **entrepreneurs** can contact us and have information and techniques to replicate this model**. No patent have been registered and we shall provide all technical and budgetary informations collected.**

A building in constant EVOLUTION…

… which will continue in improving its energy performances by acquiring advanced technologies. We can consider to eventually replace our wind turbines each of 10 kilowatts by more efficient wind turbines. Our own clean energy production through wind turbines will allow us supply a fleet of electric vehicles for our employees

OUR SKILLS

Key figures

16 jobs agencies

1 recruitment agency

1 trainings company

1 renewable energies company

58 permanent employees

1200 temporary workers, full time equivalent.

ZOOM ON…

Our wages of quality and respect:

First ISO-certified independent company of temporary work 9002; Certification ISO 9001:V2000;

Next establishment of our carbon assessment and display.

Created in 1991, ABALONE Group, specialist of the human and sustainable resources, is a company which wishes to answer to real problems and challenges facing society.

TEMPORARY WORK: Located on the whole western area, the ABALONE jobs agencies today tend to spread throughout the whole national territory. Our agencies are organized in independent, human-sized companies, and attentive to the needs of their local environment.

RECRUITMENT: based in Nantes (44), the INEXIA Consultants study works in close collaboration with ABALONE jobs agencies, and offers personalized services related to recruitment and optimization of Human resources.

TRAINING: this training and services company manages the training of ABALONE temporary workers (empowerment, certificate of fitness to drive safely-CACES) for facilitating a rise in skills. Quasar is also specialized in the training engineering in sustainable development and renewable energies

EVENTS: The Event Department based in Nantes is managed by Patrick BONNET, expert in the field of artists' management (Elmer Food Beat, Dolly), and in production and organization of shows (A l'abordage; Nantes au Zénith…). Thanks to this concept, ABALONE finally gathers together : events, show and tertiary professionals: short or long missions, respect for the independence culture, trainings offers, welfare benefits and maintening of a compensation system ... several advantages for an innovative formula.

SUSTAINABLE DEVELOPMENT and RENEWABLE ENERGIES:

Through the construction of its autonomous positive energy and zero pollution head office, ABALONE energy operates as an entity administrator of his building. Several companies (PureE.T., an Engineering consulting and Environment Company/ Eolys (wind energy) / Hydrogen Mission / Urbanelec) will move in with us to create a "Cluster of sustainable development". Working in synergy they will develop innovative projects to answer to energy issues. These companies will also be there to study permanently the building to develop it and make it intelligent. Researchers, students, professionals of the energy will guarantee and the protagonists of a center of unique experiment to the world where the technologies described for tomorrow are studied from today. Fort of its experience connected to the activity of the building, ABALONE Energy also developed a new offer proposing the marketing and the installation of photovoltaic solar panels to the private individuals, but also to the public or private enterprises.

THANKS

Special thanks to our privileged partners for their constant support on this project

PureE.T.

Engineering consulting firm, specialist in technical building solutions, environmental architectures and renewable energies, researches and develops new energy solutions.

Mission Hydrogène

Under the leadership of Frédéric Meslin, “Mission Hydrogène” aims to create and to energize a community linking industrialists and researchers to promote emergent projects. Gathers actors of the sector working on production, storage, transport or the use of hydrogen, organizes exchange meetings.

EOLYS Ressources & Energies

Company managed by Jérôme Bousquet and his team, their slogan is “ECOLOGY+TECHNOLOGY = ECONOMY+QUALITY LIFE”. With machines entirely manufactured in FRANCE as well as towers and synchronizing ring “EOLYS Optical controller”, Eolys is the French specialist of small wind turbines (between 3 and 35 kW). *www.eolys-re.com*

Your Specialist of the urban electro-mobility

www.urbanelec.com

We are grateful to our two financial partners who support us and allow us to implement some of the new energies and technologies we use:

ZOOM ON…

The partners:

Create a pool of skills with professionals of different horizons. Create a synergy, implement a complete and evolutionary project on the principle of energetic mix to build our future.

Printed on paper issued from sustainable development forest – 100% recycled

CONTACT & PLAN

Barnabé BAUDU

ABALONE Energie

barnabe.baudu@abalone-energie.com

www.abalone-energie.com

+ 33 (0)6.14.33.71.31

ABALONE Energie

43 Rue Bobby Sands - ZAC de la Lorie - BP80095

44814 SAINT-HERBLAIN Cedex FRANCE

☏ + 33 (0)2.40.69.09.83

Fax: + 33 (0)2.40.69.04.73

Visit our head office by registering on our web site:

www.abalone-energie.com

Source : www.geoportail.com