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ENERBRAIN: A PARTNER FOR SUSTAINABILITY

Founded in 2015 within the Innovative Enterprise Incubator of the Turin Polytechnic, **Enerbrain** makes buildings smart by way of an intelligent system capable of cutting energy consumption by 30% from the outset!

A technology that is easy to manage and quick to install, requiring no modifications to energy systems or complex structural works. In most cases, in fact, **it takes 2 days** to start saving, with a significant improvement to the air quality and thermal comfort of the rooms.

Fully compatible with all HVAC (Heating, Ventilation and Air Conditioning) systems, the Enerbrain system is based on plug & play **environmental sensors** that monitor building parameters in real time to then improve energy efficiency. Humidity, temperature and CO₂ levels, as well as external changes in climate and number of people present, are constantly evaluated to obtain ideal comfort. Enerbrain not only controls consumption, but also automatically intervenes to reduce it by combining existing systems with an actuator that enables the right conditions to be achieved where needed.

It is the **IoT** (Internet of Things) that, thanks to cloud computing and the intelligent algorithm developed by Enerbrain, accomplishes the revolution theorised by Industria 4.0: in this case networked buildings capable of autonomously managing their energy resources, in the name of savings and sustainability.

This **energy retrofit** system is designed especially for **large non-residential buildings**: schools, airports, shopping malls, hospitals and, in general, all those facilities that together contribute to consuming a quarter of the world's energy.

However, Enerbrain also ensures significant savings for **large industrial plants**.

In this case, the intervention does not concern so much room air conditioning, which involves just a marginal share of consumption, but the monitoring of the entire production process. An action that alone can cut costs by 10%.

The system is scalable, so it can be easily expanded to integrate new buildings, while maintaining unified and monitored management in an **analytical dashboard**, which can also be accessed from a smartphone.



INTERVIEW WITH GIUSEPPE GIORDANO - CEO ENERBRAIN

How was Enerbrain born?

After graduating in architecture I went to the United States to study and take a master's degree in sustainability and there, in Austin, I came into contact with the world of technology. I worked for two years on a project for a device that monitored power consumption every five minutes. Then I realised that another of the co-founders I was in contact with, Marco Martellacci, was working on a system for the activation and control of boilers. I therefore thought that its control algorithm could be integrated into my own monitoring system.

Can we therefore say that innovation is teamwork?

Enerbrain was born out of the union of different competencies, not only those of the 4 founders (Giuseppe Giordano, Marco Martellacci, Francesca Freyra, Filippo Ferraris) but also those of a team of experts with knowledge ranging from cybernetics to environmental engineering. Moreover, I cannot ignore the contribution of those business angels who believed in the project and helped us to put together the funds necessary for its development.

What distinguishes you from your competitors?

Our system not only keeps consumption under control, but also intervenes automatically to improve the energy balance of a building. The operator can check the efficiency of the systems at any time - even with his smartphone - but the truth is that everything happens without human intervention. In addition, a machine learning algorithm enables the system to continuously refine its programming to eliminate any possible waste.

Who are the recipients of the offer?

Our natural stakeholders are facility managers and all the other professionals involved in managing large non-residential buildings from an energy standpoint. The field of application for Enerbrain systems is therefore airports, schools, hospitals and shopping malls, but we have also developed specific applications for industry. In all these contexts, cutting energy bills has a decisive influence on the balance sheet.



5 REASONS FOR CHOOSING ENERBRAIN

1. SPEED

The Enerbrain system can be quickly installed even in large buildings. The average activation time is only two days. In practice, the effects in terms of saving energy consumption and improving indoor air quality can be measured immediately.

2. FLEXIBILITY

The energy retrofit proposed by Enerbrain is compatible with all existing HVAC (Heating, Ventilation and Air Conditioning) systems and is non-invasive: it is not necessary to modify the structure of the plants, nor to intervene on the insulation of the rooms.

3. SCALABILITY

The Enerbrain system is already designed to evolve over time, integrating new buildings within the same energy management.

4. SMART MANAGEMENT

The system is managed by an intelligent algorithm that continuously learns how to best manage resources, on the basis among other things of the number of people inside the building.

5. FACILITY

An analytical dashboard allows the energy manager to check all building management parameters, air quality and consumption trends at all times. The main data can also be controlled via smartphones. However, all management is automatic, without direct human intervention.



A PARTNER FOR ENERGY SAVING

Technology is not the only innovative aspect of the Enerbrain proposal.

The company has developed a number of commercial formulas designed to meet the needs of companies and public bodies, which can thus obtain further tax benefits from the installation of an energy saving system.

This further accelerates the return on investment and multiplies the economic benefits.

There are three options to choose from:

LEASING

With this formula it is possible to fit an Enerbrain system by paying a rental fee, usually quarterly, which is repaid with the savings in your bill.

BUY

The system is purchased directly.

ALL INCLUSIVE (former EPC)

This is the formula that covers the sharing of savings, without investments on the part of the customer. In this case Enerbrain gets involved and earns only by cutting waste, offering an original **performance payment** formula



SOLUTIONS FOR INDUSTRY 4.0

Enerbrain has also developed **specific solutions for industry**, a particularly wide field of applications that is usually characterised by a massive use of energy.

Efficient resource management can therefore have a significant impact on the company's accounts, with a positive effect on the environmental impact.

In this case, Enerbrain's intervention is not confined to the efficiency of spending on indoor air conditioning, but rather takes into consideration all production processes to lighten the energy burden.

There are three main parameters that make it possible to evaluate the effectiveness of the actions undertaken: **social, economic and environmental**.

The system performs the following checks:

- Monitoring of thermal energy consumption for the winter and summer air conditioning of working environments;
- Monitoring of process thermal energy consumption;
- Monitoring of electric energy consumption for lighting, motive power and supply of refrigeration units.

A virtuous example of this kind of consultancy is the collaboration with the **FCA Group**.

Here, the use of energy simulation software has made it possible to identify the best areas of intervention, with particular attention paid to the recovery of disused industrial buildings.

The **IoT control systems** developed by Enerbrain have permitted a reduction in the carbon footprint and a constant analysis of the power used by the various departments at all times.

The predictive analysis carried out by this complex energy diagnostics system has hypothesised a 60% saving compared to previous consumption.

A further step towards an **Industry 4.0** model that analyses in real time the huge amount of data produced at the factory to make all energy flows more efficient.



SUCCESS IN RETAIL

Two days to cut consumption by 35% and reduce CO₂ emissions by 309 tonnes: the installation of Enerbrain systems has revolutionised the energy management of the **8 Gallery** shopping centre in **Turin**.

Originally one of Fiat's most important factories, the building has long been one of the city's entertainment centres, thanks to the restoration project carried out by Renzo Piano, which transformed it into a multifunctional centre.

The new "sustainable" restyling carried out by Enerbrain has cut annual spending by fully 350 thousand euros, while also improving the level of comfort for users who flock every day to the stores and refreshment points distributed over the 10 thousand sq.m. surface.

From the previous 51% 8 Gallery has increased to 91%!

This is even more relevant in a shopping centre, because statistics confirm that by doubling the time spent by customers, sales can grow by up to 130%.

On the other hand, it took **three days** for Enerbrain systems to be installed in the 15 thousand sq.m. of the **Carrefour hypermarket in Grugliasco**.

In this case, the energy savings for ventilation reached a **percentage of 44%** over the previous management, with the comfort level rising to 100!

The consumption of gas for heating was reduced by 42%.

Enerbrain sensors installed in the shopping area monitor temperature, humidity and CO₂ and are therefore able to constantly vary the workload of the systems on the basis of the number of people actually present inside the building.



ENERBRAIN FOR THE SMART CITIES OF THE FUTURE

From a sustainability point of view, Enerbrain technology does not only reduce energy consumption but also contributes to a significant **reduction in CO₂ emissions into the environment**.

A more balanced management of a building's comfort levels also eliminates energy wastage and peaks in consumption, with the additional positive effect of stimulating greater awareness among those living in a building.

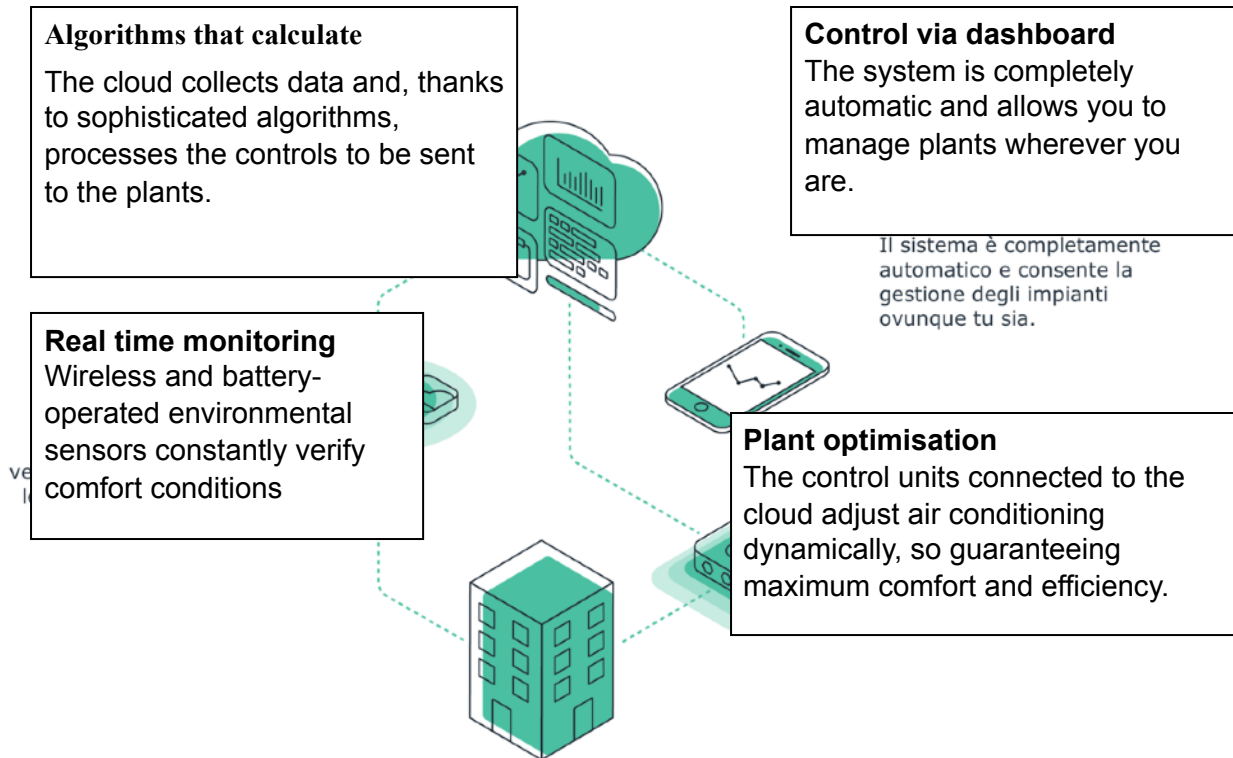
These benefits take on a systemic dimension in the project that **Enerbrain** is carrying out in Brazil in collaboration with **Planet Idea**, an Italian company specialising in the design of smart ecosystems in urban areas.

Here, on the outskirts of Fortaleza, the **world's first Social Smart City** is being created: an urban centre destined to accommodate about 25 thousand inhabitants. A smart city, designed to the highest standards of safety, sustainability and quality of life but at the same time accessible at low cost.

The idea of applying all the best smart technologies available on the market in this city is therefore functional to the development of an inclusive community, located in an area that is strategic for the interconnection of the main communication channels and therefore with excellent development prospects.

A pilot project designed to lay down the future of smart cities.

ENERBRAIN: SMART ENERGY



In just a few days Enerbrain cuts the air conditioning consumption of large non-residential buildings by 30%. The system is compatible with all HVAC systems. It provides for the application of plug&play sensors in the rooms and an actuator to adjust the air conditioning in real time on the basis of the parameters of temperature, humidity and CO₂ detected. A win-win model for energy efficiency that is rewarded by savings on your bill



ENERBRAIN: AWARDS AND RECOGNITIONS

EUROPEAN UNION SEAL OF EXCELLENCE 2017

EU TOP 50 STARTUP COMPETITION

KNOWLEDGE4INNOVATION 2017

**GARTNER AWARD “COOL VENDORS
IN SMART CITY APPLICATIONS AND SOLUTIONS 2017”**

1ST PLACE “INNOVA CON CRT”, JULY 2017

1ST PLACE IREN STARTUP AWARD 2017

ITALIAN INNOVATION DAY IN TOKYO, MAY 2017

TECH TOUR 50 BEST COMPANIES IN ITALY 2016



GLOSSARY

Sensor

A mechanical, electronic or chemical device, which within equipment or mechanisms detects the values of a physical quantity and transmits its variations to a measurement or control system.

Enerbrain sensors are called **e-Nodes**.

Actuator

In automatic control systems, the actuator is the device that has the task of executing the command arriving from the control system; it then converts a signal into an action on the final element.

Enerbrain actuators are called **eSenses**.

HVAC

Acronym for Heating, Ventilation and Air Conditioning, it indicates a building's air conditioning systems.

Retrofit

This term indicates the application of new technologies to an old system in order to prolong its life and make it more efficient.

Plug&Play

The expression used for a device that works immediately after connection, without having to reboot the system.

IoT

Literally Internet of Things refers to a set of networked devices that use the web to exchange data and information with the operating system.

Comfort level

The comfort level of a building is given by the ability to maintain a set-point temperature inside a room, guaranteeing air quality through air exchange.