



# MI@EP

## Ecoconstruction: field testing

2006 – 2011

By 2012, new buildings will have very low energy consumption. By 2020 their production of renewable energy will enable them to put energy back into the network and they will become an enormous production cooperative. However, this concept has still to be validated in the field.

The initial idea was to conduct a trial of the construction of positive energy housing. collaboration between architects, heat physicists, researchers, a construction manager and a property developer will provide the context for an examination of the necessary changes in construction practices and lead to changes in the relationship between the different players in the building sector.

MI@EP is a practical project to design, build and trial three positive energy houses on a housing estate in the ille-et-vilaine department.



A high environmental performance house designed by the Pays des Herbiers community of municipalities

Architect : Architectures et territoires scop

*“We must not think of high energy performance buildings just from the standpoint of technological innovation. In addition to satisfying technical requirements these buildings must meet functional, architectural, aesthetic, social and economic criteria. This explains why we wanted to work in a field situation, even monitoring people’s behaviours when they live in the houses. We have also assumed that this type of project is likely to alter the relationship between the different players in the building sector. The CERMA, which is a laboratory that specializes in architectural and urban atmospheres, is attempting to implement new project design tools. The PGCE can act as a go-between helping to disseminate our work within the building sector.”*

**christian marenne**, Architect, Lecturer and researcher at the CERMA (École nationale supérieure d’Architecture de Nantes)

### HOW THE PROJECT FITS IN WITH THE PGCE’S CONCERNS :

- STUDYING STRUCTURES IN COMPLEX AND/OR EXTREME SITUATIONS
- SUSTAINABILITY AND LIFE CYCLE OF BUILDINGS AND INFRASTRUCTURES
- SAVINGS IN RESOURCES
- ENVIRONMENTAL PERFORMANCE OF CONSTRUCTIONS AND FACILITIES
- OBSERVATION AND MODELLING FOR THE DESIGN AND MANAGEMENT OF SUSTAINABLE URBAN PROJECTS
- ECO-INNOVATIVE DISTRICTS

### A PROJECT THAT WAS GIVEN OFFICIAL PGCE APPROVAL IN 2006

The MI@EP project got under way in 2006 and achieved a boost as a result of the publicity given to the aims of the grenelle environment summit. From 2020 new buildings will have to consume less energy than they produce. How can we prepare for the widespread construction of high energy performance buildings? What will be the economic implications of this change? The issue is particularly crucial in the case of the single-family house market which accounts for more than half of the new buildings constructed each year. This project aims to remove the technological, methodological and economic barriers and is a response to strong demand on the part of the building industry and its clients.

### THE R&D PROGRAMME

The energetic autonomy of buildings depends on two principles:

- **reducing energy consumption by**, for example, applying new insulation, ventilation and lighting technologies, implementing new architectural approaches and adopting new design and living practices.
- **increasing autonomous renewable energy production capacities** by means of thermal solar panels, geothermal energy, wind power, heat pumps, photovoltaic solar panels, etc.

The research project consists of four phases:

- project building, canvassing buyers, agreements with future owners, preliminary studies.
- production of a guide for the design of positive energy houses.
- The design and construction of three houses.
- experimental monitoring (of technical aspects and practices) for at least one year.

### COST OF THE PROGRAMME :

€ 497k, with € 346k of funding from the ADEME (French Energy conservation Agency) in the framework of the ANR (National Research Agency) request for proposals for the PREBAT Programme (Programme for research and trials with regard to energy in the building sector).

### THE CONSORTIUM

#### 1 LABORATORY

- **coordinator: CERMA** (École nationale supérieure d'Architecture de Nantes). centre for research into the control of physical and perceptible parameters relating to architectural and urban atmospheres.



#### 2 FIRMS

- **AIA-CERA**, a grouping of architects and engineers (project management).
- **POUGET consultants**, a consultancy with expertise in systems that produce renewable energy and that save energy.

#### 1 PROJECT OWNER

- **The municipality of saint-grégoire** (Ille-et-Vilaine department): provision of three lots in a mixed development zone.

A property developer, which will be selected following a call for tenders, will be asked to specify the programme (purposes, savings) and establish the commercial feasibility of the houses.

### on the MI@EP project

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