



«The BATAN programme follows on from a previous study that had demonstrated the specific behaviour of traditional buildings, which were often built bioclimatically, and the limits of present-day design methods. We are attempting to build a model based on a typology of construction modes. The project's strength is that it takes account of the specific characteristics of traditional buildings and the actual lifestyles of those living in them. Much is expected of the project, from the Ministry, the French Energy Conservation Agency (ADEME), the Scientific and Technical Centre for Building (CSTB) and small firms. The CETE de l'Ouest is a regional infrastructure engineering office that has been recognized as a centre of excellence and innovation for the instrumentation and modelling of the thermal performance of buildings by the DGALN. In the future, we would like the PGCE to continue to call on us both for research projects for our operational expertise.»

sihem tasca-guernouti,
 researcher in the field of the energy efficiency of buildings at the centre d'études techniques de l'équipement ouest (CETE de l'ouest)

**POSITION OF THE PROJECT
 IN THE POLE'S STRATEGY:**

- DESIGN OF STRUCTURES IN COMPLEX AND/OR EXTREME CONDITIONS
- DURABILITY AND LIFE CYCLE OF BUILDINGS AND INFRASTRUCTURES
- RESOURCE SAVINGS
- ENVIRONMENTAL PERFORMANCE OF CONSTRUCTIONS AND FACILITIES
- OBSERVATION AND MODELLING FOR THE DESIGN AND MANAGEMENT OF A SUSTAINABLE URBAN PROJECT
- ECO-INNOVATIVE DISTRICTS

BATAN

tools for analyzing traditional buildings

2008 – 2011

during renovation, the French thermal regulations stipulate that the energy efficiency of buildings must be improved. but is it possible to use a single model to calculate the energy performance of a limestone urban house, a wattle and daub farm building and a 19th century apartment building? how can we be sure we are not creating problems by renovating these buildings whose thermo-physical properties are highly specific? new models and tools need to be developed in order to carry out the sustainable rehabilitation of traditional buildings, particularly those dating from before 1948.

BATAN is a research programme that sets out to model the thermal performance of traditional buildings.



The BATAN computation model has been built from a small panel 14 traditional residential buildings which have undergone little or no modification.

PROJECT GIVEN THE PGCE'S SEAL OF APPROVAL IN 2007

In order to limit the energy consumption of buildings, the actors involved in ecoconstruction have given priority to innovation for new construction (low consumption building standards). Attention also needs to be given to rehabilitation of the existing housing stock. However, the existing analytical and advisory tools are unsatisfactory, particularly in the case of buildings dating from before 1948. The pôle génie civil écoconstruction is paying very close attention to the research and development activities of its partner the CETE de l'ouest. These include the BATAN calculation software programme that could ultimately lead to developments in the thermal regulations. The new model takes account of traditional buildings and indispensable for reliable diagnosis and assisting decision-making for those responsible for rehabilitation works.

THE RESEARCH PROGRAMME

BATAN follows on from a study of traditional buildings and energy savings conducted by the CETE de l'Est, the Laboratory of Housing sciences (Laboratoire des sciences de l'Habitat (LASH) and the Association maisons Paysannes de France.

The BATAN project has the following goals:

- To carry out in-situ studies of the physical phenomena which characterize the thermal behaviour of traditional buildings, with reference to three areas which appear to pose problems for present-day models: the influence of the local environment; transfers of heat, mass and humidity inside the envelope; the role of occupants.

- To develop a new calculation model based on the physical study. The model in question should take account of the various construction techniques, include all the specific characteristics of traditional buildings and the evaluation of thermal behaviour (winter, summer, "in-between season")

- To identify the real issues in order to optimize the strategies for the energy upgrading of traditional buildings (improving the building's equipment or envelope, etc.).

The programme is in 5 stages:

- The current state of knowledge as regards the thermal behaviour of all buildings (managed by CETE EST): drawing up a typology of traditional buildings and choosing panels of buildings for study

- study of the real behaviour of the limited panel (managed by CETE ouest): developing the protocol for the measurements, instrumenting the 14 buildings, data collection and analysis

- Development of the BATAN model (managed by DGCB-LASH): formalization of the model, simulation on the limited panel, comparisons between measurements and simulations

- validation of the model on the extended panel (managed by INSA strasbourg): modelling of the 50 buildings in the extended panel; evaluation and recalibration of the model

- summary report and provision of the model for distribution (CETE EST)



A weather station collects data near each instrumented building in order to identify the influence of the local environment.

COST OF THE PROGRAMME

€ 582 k, financing by the ADEME and the "General directorate for Housing, Planning and Nature" (direction générale de l'aménagement, du logement et de la nature - DGALN) at the ministry of the Environment, Energy, Sustainable development and the sea (MEEDDM)

THE CONSORTIUM

centres d'études techniques de l'équipement : CETE EST, CETE ouest
Laboratoire des sciences de l'Habitat (LASH-DGCB Rhône Auvergne) de l'ENTPE (Ecole nationale des travaux publics de l'Etat)
INSA strasbourg (Institut national des sciences Appliquées)
L'Association maisons Paysannes de France

on the BATAN project

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on setting up a collaborative innovation project

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