Main issues and definition

- **Evaluation of hourly heating load, accounting for intermittent heating, solar gains, equipment, control and occupants**

- **More accurate than monthly / annual calculation, accounting for temporal variation of temperatures, energy storage e.g. from noon to evening,**

- **Evaluation of thermal comfort, in summer and mid-season, study of passive cooling measures**

- **Aid in the design of a renovation project, comparison of alternatives, certification**

TREES

MINES PARIS ARMINES

Use in a renovation project and main limits

- **Modelling the existing building, then assessment of renovation measures (heating load + comfort)**

- **Same problems as for simplified calculation : difficulty to evaluate thermal bridges and air renewal rate, wall characteristics sometimes unknown (thermal insulation ?)**

- **possibility to identify these parameters using the measured energy consumption**

- **average inhabitants' behaviour (internal gains, window opening, use of solar protection…)**

- **Around 5 man-days to model a building and study a renovation project**

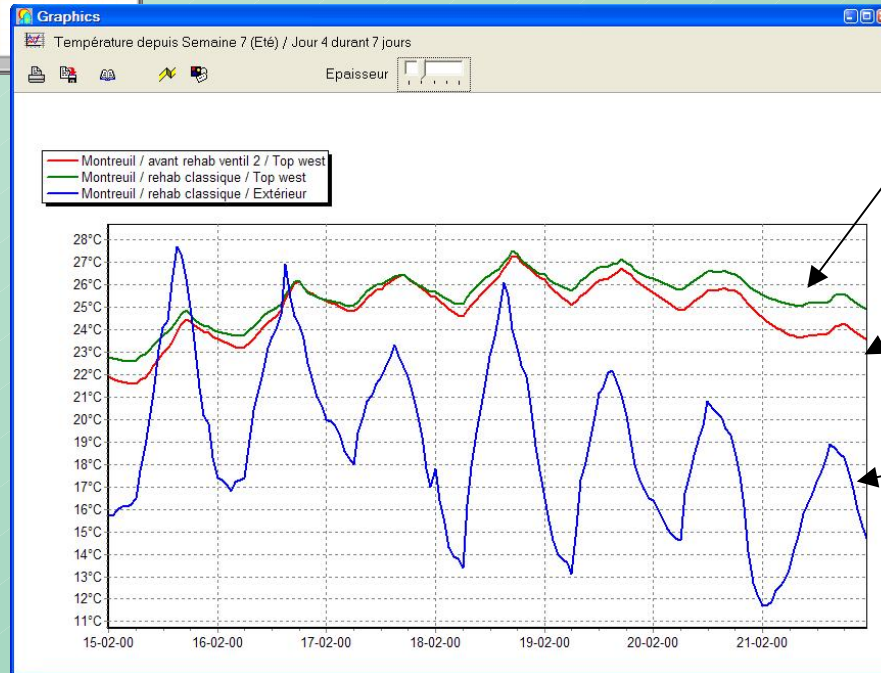TREES

MINES PARIS ARMINES

Example tool : COMFIE, www.izuba.fr
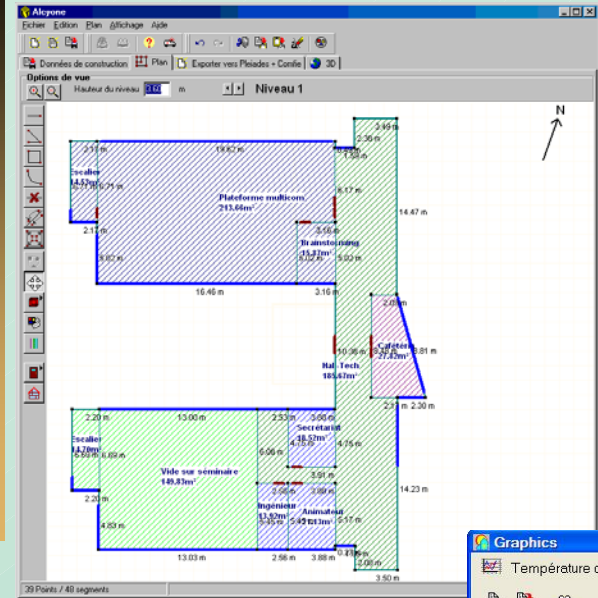
**2D plan ->
3D image
export data to
energy
calculation
tool**

**after
renovation**
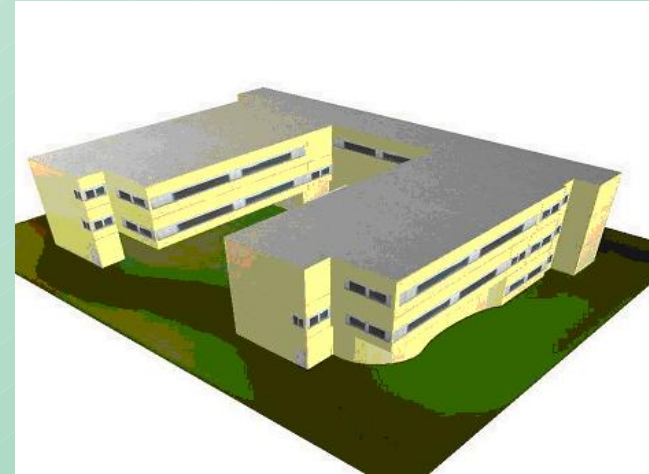
**before
renovation**

**Graph editor,
temperature
profiles**

external