

# The energie+ CD-ROM: a decision making tool for building managers

Fabrice Derny

Université Catholique de Louvain, Architecture et Climat. Place du Levant, 1, B-1348 LOUVAIN-LA-NEUVE

Email: derny@arch.ucl.ac.be

## KEYWORDS

energie+, tool, decision-making, computer, energy, buildings, managers, electricity, relighting, evaluate, improve, design, efficiency, comfort, project, equipment, calculation, CD ROM, Internet, consumption.

## ABSTRACT

Purpose of the work:

- Synthetize knowledge and expertise concerning energy efficiency in tertiary buildings and make it accessible to Building and Facility Managers
- Provide the "Energy Manager" with the essential elements to be critical concerning his own building, to help him to improve his situation or to conceive a new high performance installation
- Provide the Building Manager with specific information concerning the building type he is in charge of.

The energie+ CD-ROM is a computer tool that allows the user to come right to the information he needs, with several information level. For instance, it is recommended "to install low brightness lights in computer rooms":

either that information is sufficient for people who are familiarized with the existing material

or a simple "clic" with the mouse allows to know what is a low brightness light and how it works

Excel sheet programs complete the whole information and allow each Manager to quantify his own situation. For instance, for ventilation: evaluation of the cost of fresh air supply, profitability of an output control by CO2 detector, profitability of a heat recuperator...

Detailed case studies allow also visualizing retrofitting already carried out on various buildings.

## BACKGROUND

More than 10 years ago, the Walloon Region started an energy saving program to help managers of building from the public sector as well as from the service and public related sectors (managers that we named the "Energy Managers").

The program offers investment subsidies, training, thematic publications and building audits. It has reached several thousand people.

The recent development of multimedia technologies opened new doors in terms of dissemination and above all in terms of structure of the information.

This is why, in 1998, the research team «Architecture et Climat» from the UCL (Catholic University of Louvain, Belgium), on the initiative of the Energy Division from the Walloon Region, set about to synthesise in a CD-ROM the experience accumulated on energy efficiency in buildings of the service sector.

## A DECISION-MAKING TOOL?

### A building approach

The technical manager needs practical information corresponding to the type of building he is in charge of. For example, a hospital manager does not have the same need as the manager of a school or of a sport centre. The energie+ user will usually have access to the specific information related to his type of building.



This is how the energie+ CD-ROM “a decision making tool for building managers” got started.

### A project approach

The proposed methodology follows a project dynamic, in opposition to a gathering of encyclopaedic data.

The first step is to assess the quality of the existing installations: level of comfort, energy efficiency. It is then possible to judge the opportunity to improve them.

The second step is to plan a new efficient installation, or at least, to be critically informed towards the retrofitting solutions offered by professionals. The possible technical choices are discussed, case by case.

For example, in order to successfully renovate a lighting installation, energie+ first proposes to analyse one’s existing situation:

- Do I use a lot of electricity?
- What’s the part of lighting in my consumption?
- What level of visual comfort is provided?
- How much electricity does my installation use, compared to an efficient installation?
- What is the energy efficiency of bulbs, of lighting fitments?
- What can a retrofit bring?

Then, it sets to decide on an efficient installation:

- What are the existing equipment on the market?
- Do we have to replace just the bulbs or the ballast or the whole installation?
- How to light a computer-room, a classroom, a hospital room?
- What kind of lamp, of ballast to choose?
- How many lighting fitments must be installed?
- How should they be arranged?

When it is necessary and possible, spreadsheet software enable to directly apply the available information to one’s situation.

For example:

- To assess the lighting level of a room
- To calculate the profitability of a retrofit
- To calculate the interest of putting an occupancy sensor in a room
- To roughly size an installation
- ...

### A COMPUTER TOOL?

What is the advantage of computer tool compared to a “paper” type of information?

#### An unlimited quantity of information

A CD-ROM can contain an enormous amount of data. The final version of energie+ will gather the same volume of information as 10.000 paper pages. This enables to go far into the details. For example, when presenting case studies with all the details of the project, from the design to the realisation, while describing also how the equipment are working and while giving all the necessary theoretical background

#### A direct access to information

There are various levels of menu, giving quick access to the information looked for, with reference points to locate oneself within the program.

A keyword access also enables a rapid search result for specific information.

For example, by typing “ballast” in the keyword search, there is a direct access to the following pages:

- “What is a ballast?”
- “Choice of a ballast”

#### Different levels of information to suit different users

Software allows different levels of information directed towards users with different level of knowledge, which is difficult to do within a training session or in a publication.

For example, I have to retrofit the lighting of my computer room. With the keywords “Luminaires & Computer”, I access the choice of luminaires for offices equipped with computers. It is there said to use “low luminance” luminaires. If I know about such fixture, fine. If not, I can click on the words, get the description of such a fixture and learn how it works. I’ll do the same if I don’t know what an optic is...

It is the end of footnotes “see page 125”. You get a direct access to a variety of tools paralleling the main approach: theoretical tools (definitions...), descriptions of devices, calculation tools...

Of course, for the person who wishes a direct access to the tools, they are always accessible via the main menus (equipment, theory, calculations...)

## AN EVOLVING TOOL

energie+ has been first made available as a CD-ROM.

Indeed, in 1997, 1998, when the project started, Internet was not yet a given feature in public institutions. However, with foresight, the language “htm” was chosen as a conception standard, which will allow an Internet distribution when needed.

In its Internet version, the tool will be constantly completed and refined following the increase of data, the emergence of a new technology, a new case study to display, a change of electric tariffs,... All those data can be easily integrated in the tree structure of the tool and be directly accessible to the user.

## FOR BUILDING MANAGERS?

The computer tool in its first release only treated lighting. It was a test for a more ambitious project. In the end (forecast for December 2002), all the energy related posts of a building would be similarly covered. Release 2 already includes all electrical usage: air-conditioning, cooking, workstation and of course the lighting part already present in release 1. The final version will add the building envelope and heating systems.

A tool for whom?

The target is the technical manager of a building of the service sector (an “Energy Manager”). The aim is not to transform him into a consultant specialised in specific techniques. The data given should enable him to be critical toward his own installation (“Is it worthwhile to start retrofitting it?”) and to discuss the proposed solutions coming from professionals, consultants, manufacturers... For example, energie+ does not include software to size an installation but does include software to get a first estimate and establish levels of scale.

The target public could nonetheless be enlarged. energie+ could be of use to architects, consultants, maintenance companies,...

This is confirmed by the reactions following the dissemination of release 1 and 2. 3000 free copies of release 2 were ordered, mainly by Energy Managers but also by designers.

Most of the reactions -mainly positive- came from those last ones. They appreciated:

- The quantity and the quality of the data presented,
- The kind of data: up to now, there was no publication on design and retrofitting of installations looked at from a project point of view and, more importantly, with an energy efficiency approach.
- The facility of navigation on the tool.

Unfortunately, we lack feedback from Energy Managers having used energie+ to carry out an improvement project. Up to now, we cannot confirm that this tool perfectly answers the need of its target.

This assessment should take place, for example during training where participants are encouraged to use the tool to realise their personal projects.

## PROSPECTS

### Tool for an energy information policy in the Walloon Region

In the long term, energie+, as a global tool, could help to federate the policy geared towards Energy Managers, in the Walloon Region.

That policy has four poles: awareness raising, information, training and audits. For each of these poles, the computer tool can be a support and an important source of information for publications, training programmes... Conversely, each of these actions can feed the tool with its experience (way to treat the information, answers to questions asked in the field, case studies...)

Similarly, the computer tool can be a dissemination tool for the result of numerous researches and developments in term of energy efficiency.

The possibilities offered by Internet allow, furthermore, to use energie+ as a link to other energy efficiency promoting sites. For example, sites that would give all the energy training organised in the Walloon Region or elsewhere, sites specialised in a specific technology...

### Towards standard specifications...

In September 2002, a new mission financed by the Walloon Region will start. Its content will be to translate the information from energie+ into “RUE” (Rational Use of Energy) specifications or recommendations that would be included into the specifications of standard State contract.

This would have a direct impact on the designers (architects, design office...) as those specifications are used by the majority of the consultant offices, in the public and the private sector.

### Towards a label...

Presently, energie+ (in its energy consumption part) is used as a basis for some companies willing to obtain the certification « E Mass » or « ISO 14000 ».

The same “ energie+ ” label could be developed for maintenance companies. This nevertheless requires to give a close look at the specific context linking the maintenance company to its client. Could we, for example, request the client to shut off his heating system for the night or request that he uses occupancy sensor in his light management?

To be followed, thus ...

### Maintenance of the content

Of course, such a tool must be maintained and updated or it will quickly become obsolete.

Presently, how it will be maintained has not yet been defined. At best, collaboration should take place with the manufacturers so as to be informed of new technologies coming to market as well as with the various actors in the Region so as to include the result of their future researches in the tool.

**TABLE OF CONTENT**

Here is the table of content of the release 1 “Retrofitting lighting”

<b>Menu</b>	<b>In practical terms</b>
<b>Retrofitting lighting</b> Offices Schools Sport centres Hospitals Workshops Outdoor spaces	To assess the existing situation and to realise a retrofitting project with information specific to the type of building.  Examples: How many lux in the halls? Electronic ballast: interesting in a classroom?
<b>Equipment</b> Lighting systems Lamps Ballast Luminaires Commands	To directly access technical information related to a specific equipment: what it is and how it works.  Example: What is a “low luminance” luminaire? Or a “high-intensity discharge lamp”?
<b>And more</b> Bill analysis Financing the retrofitting Awareness raising of the building users Energy accounting Maintenance of the installations	To understand the tariff parameters Subsidies, retrofitting grants How to run an awareness campaign To compare annual consumption How to maintain the installations...
<b>Tool bank</b> Theories Calculations Regulations Measures Bibliography Address book	Theoretical complements on lighting (lux, ...) Excel spreadsheet to put a figure on projects Workers protection laws, references to the legal norms... Appliances and measuring methods Reference books and software Addresses of organisations in the building sector
<b>Case studies</b>	To follow step by step real retrofitting projects with their technical solutions, their budget estimates...
<b>Keywords</b>	To directly access the information via a internal search engine

**TECHNICAL INFORMATION**

energie+ can be used on PC with Windows 95 or up. There are no specific installation needed. It uses the Internet Explorer 5 or Netscape 4.75 navigators.

Excel 97 is necessary to use the various calculation programs.

energie+ has only a French version up to now. (a Dutch version of the release 1 “Retrofitting lighting” is currently being translated for the Brussels Capital Region)

Release 2 “Reducing electricity consumption” (including lighting) is available for free, on request at the Energy Division of the Walloon Region (m.glineur@mrw.wallonie.be).

Release 3 will be available beginning 2003.

**REFERENCES**

*energie+, version 1: rénover l'éclairage, Architecture et Climat, Université Catholique de Louvain, 1999.*

*energie+, version 2: réduire les consommations électriques, Architecture et Climat, Université Catholique de Louvain, 2001.*



la décision

Projet de rénovation

RÉALISER

- choisir les ballasts
- choisir les lampes
- choisir les luminaires
- choisir la gestion
- prédimensionner
- vérifier un cahier des charges

Réaliser

e calcul

Calculer

