

# **The cadastre of buildings' energy performance - The Case Study of the Regione Lombardia**

**Massimiliano ROMAGNOLI, Italy**

**Key words:** Energy, Environment, Law, Building.

## **SUMMARY**

As part of a series of national law for energy saving the Regione Lombardia has realized a system of energy certification of buildings in order to make citizens aware of what they consume their buildings and to change the property market.

This paper wants to describe the procedures, and the system to make a cadastre of buildings' energy performance and the role of Italian' surveyors about this theme.

...

# The cadastre of buildings' energy performance - The Case Study of the Regione Lombardia

Massimiliano ROMAGNOLI, Italy

## 1. SUBTITLE

*The proposal from the Lombardy region to create a certification system for energy consumption of buildings in the service of environmental improvement.*

Text

A recent national legislation provides that, in successive times, all Italian properties with an heating/conditioning system are required to adopt a document, also known as Energy Performance Certificate (ACE "Attestazione Certificazione Energetica"), which indicates the energy performance of the building on a conventional scale.

One of the most important priorities in the Italian legislation is the rational use of energy in order to reduce pollution in areas with high smog levels. We could reach this target by

- raising awareness and making landlords conscious of what their houses, waste away in terms of energy;
- stimulating the redevelopment of buildings that are energy-wasters
- creating an "energy cadastre", a public register where everyone can learn about the performance of each individual property;
- affecting the housing market to penalize energy-wasting buildings instead of the buildings with high efficiency;
- making a decision support system for local and national government for planning energy-saving policies.

In order to implement federalism in Italy, the national law provides that each region could define, through its own regulations, the principles of the national standard.

In this (case) study I would like to describe which actions Regione Lombardia (one of the largest and most populous Italian region) has made to achieve its goals.

Regione Lombardia is located in Northern Italy, in the heart of Europe is in fact the most economically advanced area of transit to the Mediterranean sea and a bridge between east and west of the old continent.

The strategic geographical position has favored the fact that Regione Lombardia has become

one of the most industrialized and densely populated regions of Europe.

This development conditions together with the region's territory characteristics and the continental climate that is distinguished by cold winters and hot, humid summers with a few constant winds. Regione Lombardia is also characterized by a serious air pollution due to important industrialization and not only.

Regione Lombardia has prepared very detailed rules on certification and buildings' energy efficiency

These rules provide that any work on buildings must be aimed to save the energy.

Obviously different ways were identified according to performance standards' consistency for building construction and equipment by building's enclosures.

These limits are more restrictive than the current national standards and anticipate the goals of the national framework law in terms of timing and energy performance.

To make a performance monitoring of the buildings Regione Lombardia has created a public company called CESTEC the specific competencies of this institution are

- accreditation of Subjects Certification;
- creation and management of the energy cadastre of buildings
- development and updating of software for calculating the energy certification of buildings;
- control over energy certificates and accomplishments of those certifiers;
- development of guidelines for the organization of training courses and the exam;
- update of the calculation procedure for determining the energy performance requirements for buildings;
- update the operational procedure for making ACE and Energy Banner;
- monitoring the impact of the provisions relating to energy certification on end users, in terms of bureaucracy, charges placed against them, the benefits obtained
- monitoring the impact of the provisions relating to energy certification on regional real estate market, the construction companies, materials and building components and the production and installation and maintenance of air conditioning systems;
- scientific and technical advice and assistance to local governments, to certifiers for the purposes of a more effective and uniform implementation of standards on energy efficiency in buildings;
- adoption of measures for suspension and revocation of accreditation.

Detailing the various activities, the central subject of this report is also to describe the procedure for energy certification that updates buildings' energy cadastre.

These activities are executed by qualified professional surveyors.

To make this accreditation, the surveyors not only must have the required qualification and skills but need to attend a specific course: CESTEC of at least 80 hours.

At the end of the course the surveyors must pass a professional examination.

In addition, the professional has the obligation of continuing education according to CESTEC rules in order to be updated on legislation, technology and construction techniques involved.

The surveyors process an Energy Performance Certificate (ACE) according to regional calculation procedure, on the basis of a previous detailed analysis of the building shell and equipments installed inside.

To certify a property, the following activities are required by the professional:

- survey and verification of the building's condition,  
the technician must verify and measure the building's plan, type stratigraphy/tomography and thickness of the walls, type and size of windows, the characteristics of the equipment installed

- analysis and collection of documentation relating to the building's shell,  
after the inspection, the technician must recover the technical specifications of materials or equipment installed on the property through documents that had been registered in public offices or through manufacturer's data documents

- calculation of the energy performance,  
the data collected must be entered in a free software designed specifically called CENED. The software processes calculation in accordance with the proceedings established by law.

- registration in the cadastre regional energy,  
at the end of the procedure and after verification of the professional, the software creates a XML data exchange file, which must be transmitted electronically at the energy cadastre database by CENED website. These data are associated with the land registry data and are also linked to a GIS by georeferencing performed by the surveyor during the registration process.

- making of Energy performance certificate (ACE),  
complete the registration process, the CENED website allows you to print the Energy performance certificate (ACE). The ACE contains a set of standardized parameters that clearly and immediately give an idea of the consumption of the building in determining the various components of the Energy Rating and an estimation of greenhouse gas CO<sub>2</sub>. The results of this analysis are summed in an energy class by a scale ranging from A+ to G.

- ACE delivery to the customer's document,  
the customer has the obligation to enclose the ACE to every contract if he either sells or rents the property and must insert the energy class value in all advertisements relating to real estate trading. If he fails to do this he would support the consequences as the law stands.


The document ACE

The document ACE consists of two A4 pages :


The first part contains the identification data of the Building, its location, the aerial photo of the building to which the ACE is reported, the owner's details, all certifier's data.

Also, in this first part, are represented by graphic and text:


- The EPH indicator on the winter heating and then the class of the building
- The ETC indicator on the heat demand for summer air conditioning
- The Estimates of emissions of greenhouse gases CO<sub>2</sub>



Unione Europea



Regione Lombardia



Comune di

# ATTESTATO DI CERTIFICAZIONE ENERGETICA

ATTESTATO DI CERTIFICAZIONE ENERGETICA

valido fino al

### Indicatori di prestazione energetica

**Fabbisogno annuo di energia termica**  
 Climatizzazione invernale  $ET_{n}$   
 Climatizzazione estiva  $ET_e$   
 Acqua calda sanitaria  $ET_s$

**Fabbisogno di energia primaria**  
 Climatizzazione invernale  $EP_{n}$   
 Climatizzazione estiva  $EP_e$   
 Acqua calda sanitaria  $EP_s$

**Contributi**  
 Fonti rinnovabili  $EP_{nr}$

**Efficienze medie**  
 Riscaldamento  $f_{g,r}$   
 Acqua calda sanitaria  $f_{g,s}$   
 Riscaldamento + Acqua calda sanitaria  $f_{g,r+s}$

**Totale per usi termici EP<sub>t</sub>**

**Altri usi energetici**  
 Illuminazione  $EP_{ill}$

### Specifiche impianto termico

**Tipologia Impianto**

**Sistema di generazione**

Tradizionale

multistadio o modulante

numero generatori \_\_\_\_\_  
 potenza termica nom. al focolare combustibile utilizzato \_\_\_\_\_

condensazione

multistadio o modulante

numero generatori \_\_\_\_\_  
 potenza termica nom. al focolare combustibile utilizzato \_\_\_\_\_

pompe di calore

numero generatori \_\_\_\_\_  
 C.O.P / G.U.E. \_\_\_\_\_  
 combustibile utilizzato \_\_\_\_\_

teleriscaldamento

combustibile utilizzato \_\_\_\_\_

cogenerazione

consumo nom. di combustibile combustibile utilizzato \_\_\_\_\_

ad alimentazione elettrica

potenza elettrica assorbita \_\_\_\_\_

altro (si veda campo note)

Possibili interventi migliorativi del sistema edificio impianto termico						
Intervento	Superficie interessata (m <sup>2</sup> )	Prestazioni U (W/m <sup>2</sup> K)	Risparmio EP (%)	Priorità intervento	Classe energetica raggiunta	Riduzione CO <sub>2</sub> (%)
Involucro	Cobertazione delle strutture opache verticali rivolte verso l'esterno					
	Cobertazione delle strutture opache verticali rivolte verso ambienti non riscaldati					
	Cobertazione delle strutture opache orizzontali rivolte verso l'esterno					
	Cobertazione delle strutture opache orizzontali rivolte verso ambienti non riscaldati					
Cobertazione delle coperture	Cobertazione delle coperture					
	Sostituzione delle chiusure trasparenti comprensive di infissi rivolte verso l'esterno					
Impianto	Sostituzione generatore di calore					
	Sostituzione/adeguamento del sistema di distribuzione					
	Sostituzione del sistema di emissione					
FER	Installazione impianto solare termico					
	Installazione impianto solare fotovoltaico					
TOT	Sommatoria di tutti gli interventi ipotizzati					

**Note**

**Timbro e firma**

Il Soggetto certificatore dichiara, sotto la propria personale responsabilità, di aver redatto il presente attestato in conformità alle disposizioni contenute nella deliberazione di Giunta regionale n°1007/08 e s.m.

Accettazione del Comune \_\_\_\_\_ Soggetto certificatore \_\_\_\_\_

Il presente attestato, documento l'avvenuto pagamento, da parte del Soggetto certificatore incaricato, del contributo di euro 10,00 dovuto all'Organismo regionale di accreditamento e ha stesso valore di ricevuta del catasto energetico.

www.cened.it

The second page contains instead many detailed parameters divided into three sections:

- "Energy Performance Indicators" which contains various measurements of energy needs and efficiency of heating, hot water and hot water + heating.
- "Specific heating system" that contains the type of heating and power plant.
- "Possible improvements of the building / heating system" contains the possible improvements on the structure of the building and the heating system, and at least one component is calculated to improve energy and emission of carbon dioxide and energy achieved by the class intervention.

The energy performance certificate is valid for up to 10 years from its date of issue and must be updated if any changes in terms of energy absorption occurs due to any kind of intervention .

The audit work on the certificates is the responsibility of CESTEC that operates on a constant monitoring of controls by ACE and has its own inspectors in order to ensure proper operation of the certifiers.

These controls are not applied at random but are monitored on a number of risk factors for each certification carried out by the professional ;these criteria are:

- high or too low number of certificates for each certification;
- outliers of the index of building energy performance;
- values of the energy performance to the next class limit;
- energy performance of low performing;

Where the controls find differences between the certificate and the real situation of building are provided for sanctions against certifiers. These penalties can be fines and may include the removal from the register regional of accredited professionals.

The modern Italian surveyor is also an "Energy Certification Specialist" as he has consolidated skills in building, surveying and cadastre; practical approach to problem solving; appropriate training in technical physics. All that makes the Italian surveyor a technician ready to face challenges of environmental sustainability in order to meet customers and community's requirements .

## REFERENCES

<http://www.cened.it/cenedhome>  
<http://www.cestec.it/home>  
<http://www.enea.it>  
<http://www.regione.lombardia.it/>

## BIOGRAPHICAL NOTES

### Massimiliano Romagnoli

I was born on 14/01/1975 in Milan - Regione Lombardia (Italy).

I'm a private practice surveyors, member of a CNGGL section of Cremona (CR).

I'm also employed part time as technician in a public administration, the Municipality of San Giuliano Milanese, a big Town located in the area Metropolitan Area of Milan.

My work interests are : building, urban planning, environmental, GIS and use of information technology applied to land management.

## CONTACTS

Massimiliano Romagnoli Geometra  
 Studio Tecnico Massimiliano Romagnoli  
 Via Matteotti, 7  
 26010 Casaletto Ceredano (CR)  
 ITALY  
 Tel. +39 338.98.050.90  
 Fax + 39 02 51.44.93  
 Email: massimiliano.romagnoli@gmail.com

Massimiliano Romagnoli c/o Comune di San Giuliano Milanese (MI)  
Settore Tecnico e Sviluppo del Territorio  
Via De Nicola, 2  
20098 San Giuliano Mil.se (MI)  
ITALY  
Tel. +39 02.98.207.304  
Fax + 39 02 98.24.11.10  
Email: [massimiliano.romagnoli@sangiulianonline.it](mailto:massimiliano.romagnoli@sangiulianonline.it)  
Web site: [www.sangiulianonline.it](http://www.sangiulianonline.it)