Implementation of the EPBD in Romania
Status in November 2010

1 > Introduction

The implementation of the EPBD in Romania is the overall responsibility of the Ministry of Regional Development and Tourism (MDRT), and it has influenced regulations, building laws, governmental decisions, as well as the Government’s determination to secure energy supplies for homes and businesses.

Romania has adopted appropriate measures to transpose the EPB Directive into the national law: on the 1st of January 2007, the Law 372/2005 on the transposition of the EPBD into national law came into force. Many other Orders and regulations were created in order to complete the issue of the energy performance of the building field.

2 > Certification

Certification of buildings

The energy consumption of buildings and the energy certification were subject of national regulation before the EPB Directive. Since 2000, Romania already had technical norms for energy consumption evaluation, building certification and building audit available before transposition of the EPBD on the 1st of January 2007.

In December 2005, the Parliament of Romania adopted the Law 372/2005 regarding the transposition of the EPBD into national law. It was published in the Official Monitor on the 19th of December 2005, and came into force on the 1st of January 2007, with the exception of the mandatory energy certificate for residential buildings when constructed, sold or rented, which should have been applied starting from the 1st of January 2010. In January 2010, the Government postponed the residential buildings’ certification until the 1st of January 2011.

The methodological norms concerning the transposition of the Law 372/2005 were published on the 12th of October 2007 by Order 691/1459/288/2007. The execution orders are the responsibility of the Government and the local authorities. Law 372 defines the legal frame for the Calculation of energy performance of new and existing buildings, Certification of buildings, Inspection of boilers and air-conditioning systems, and independent expert Accreditation, i.e., articles 4, 5, 6, 7, 8, 9 & 10 of the EPBD.
On the 1st of February 2007, Order 157/2007 brought into force the new “Methodology of calculation of the energy performance of buildings - Mc 001/1,2,3 - 2006”, taking into account the EPBD standards, especially EN 13790 for heating and cooling, not available up till then. In Part II, Chapter 5 of the new Methodology, the alternative calculation methods for heating and hot water consumptions have been included, based on the previous Romanian research activity.


The Energy Performance Certificate

In Romania, the building certification activity started in 2005, on the base of national regulation. Starting on the 1st of January 2007, the building energy performance law 372/2005 and the calculation methodology Mc 001/2006 came into force for all new buildings, existing public buildings and major renovation works, except residential units when sold or rented.

The Romanian Energy Performance Certificate (EPC) takes into account the final energy consumption of the actual building and the reference building; conversely, the apartment certificate refers only to the actual flat.

The energy certificate has two pages. The first page displays the characteristics of the building performance, such as: final annual specific energy consumption for heating, cooling, ventilation, hot water, lighting, total specific energy consumption and CO₂ emission. The energy class for the existing and the reference building, as well as the energy mark, are also included in the first page. The second page indicates the energy scale ranging from A to G for each type of installation, as well as information on the reference building. Energy performance is expressed by the final total specific annual assessed energy consumption [kWh/m²-year], including all installations in use for normal building operation.

Every building and its reference building have an energy benchmark, calculated as a function of the total specific annual energy consumption and penalty, as following:
N = \exp (-B1 \cdot qT \cdot po + B2) \quad \text{for } (qT \cdot po) > qTm \text{ kWh/m}^2\text{.year}

N = 100 \quad \text{for } (qT \cdot po) \leq qTm \text{ kWh/m}^2\text{.year}

Where: \(qT\) is the specific final total calculated annual energy consumption for space heating, hot water, lighting and ventilation/air-conditioning, and \(po\) is the penalty coefficient taking into account the rational operation of the building and its installations:

1) For buildings with heating, hot water and lighting installations:

\(qTm = 125 \text{ [kWh/m}^2\text{.year]}\) is the final specific energy consumption;

\(B1 = 0.001053, \text{ and } B2 = 4.73724\)

2) For buildings with heating, ventilation/air-conditioning, hot water and lighting installations:

\(qTm = 150 \text{ [kWh/m}^2\text{.year]}\) is the final specific energy consumption;

\(B1 = 0.000742, \text{ and } B2 = 4.71556\)

The penalty coefficient \((po)\) is the result of bad management of the existing building, and its use decreases the benchmark of the building. There are 12 penalty types \((\Pi)\) for envelope and HVAC systems and equipment; \(p0 = \Pi p_j\). The penalty coefficient values vary between \(p0 = 1\) for a very good envelop without cracks and air and water infiltrations, and very efficient installation, up to \(p0 = 2.22\) for a building with a very low maintenance.

**Requirements for new buildings, major renovations and existing buildings**

For new buildings, the Order 2055/2005 concerning the revision of the thermal regulations for buildings C107 was approved on the 13\textsuperscript{th} of December 2005. This regulation has been amended in October 2010 (C107/2010 annex 3) by improving thermal resistance values.

The type and level of requirements for new buildings depend on the type of building (dwellings, office buildings, schools, etc.) and the envelope of the buildings:

- Minimum thermal resistance corrected with thermal bridges \(R'\) - value.
- Maximum thermal transmittance corrected with thermal bridges \(U'\)-value.
- Maximum overall thermal coefficients \(G\)-values.

The proof of compliance must be made in two stages:

- When requesting for the building permit.
- After completion of the building (commissioning).

The control of the regulation is the responsibility of both the accredited experts registered in the Building Certification System, who verify the design, as well as the Municipality where the building is located.

For **existing buildings**, the actual building is compared with a reference building having the same shape and the \(U'_{\text{max}}\)-values provided in Table 1.
If upgrading of an existing building is performed, a combined technical and economical assessment is conducted. The values of energy performance and economic assessment are the result of the Romanian Methodology application. The final solution is based on investment cost, energy consumption reduction and payback time value, compared with the maximum accepted value of 10 years and the conventional lifetime of the technical solution.

Since the transposition of the EPBD into Romanian legislation by the Law 372/2005 and after the adoption of the design norms C107/1, 2-2005 regarding the minimum values for the thermal resistance of the envelope, the most important government decisions with important impact on the existing building stock are the following:

- The national programme for thermal rehabilitation of existing blocks of flats.
- The Order 174/2008 - consolidated version on special measures for the thermal rehabilitation of multi-storey residential buildings, including third-party financing through the thermal rehabilitation works.

### Table 1 - Reference U’-values required for residential buildings (C 107)

<table>
<thead>
<tr>
<th>ENVELOPE UNITS</th>
<th>$U'_{\text{max}}$ [W/(m²K)]</th>
<th>$U'_{\text{max}}$ [W/(m²K)]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maximum Thermal transmittances corrected with the influence of the thermal bridges</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C107/2010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential buildings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Newly built**</td>
<td>0.57</td>
<td>0.71</td>
</tr>
<tr>
<td>Existing to be renovated*</td>
<td>1.30</td>
<td>2.50</td>
</tr>
<tr>
<td>Newly built after 1998</td>
<td>0.20</td>
<td>0.33</td>
</tr>
<tr>
<td>Ground floors (no basements)</td>
<td>0.35</td>
<td>0.60</td>
</tr>
<tr>
<td>Floors of heated basements</td>
<td>0.22</td>
<td>0.33</td>
</tr>
<tr>
<td>Ground floors (no basements)</td>
<td>0.21</td>
<td>0.24</td>
</tr>
<tr>
<td>External walls of heated basements</td>
<td>0.35</td>
<td>0.50</td>
</tr>
</tbody>
</table>

*) values for the reference buildings  
**) mandatory for new buildings, recommended for thermal rehabilitations
The aim of the Government Ordinance 18/2009 is to increase the effect of the EPCs, to reduce the energy consumption for heating and to improve the esthetical aspect of the town. The O.G. 18/2009 has an important impact on the existing building stock, due to clear specification of financing and energy performance requirements. According to this ordinance, the costs of the EPC audit and technical project are supported by the Government. The execution works are supported as following: 50% by the Government, 30% by the local authorities and 20% by the owners.

According to the EP, the expert must propose the appropriate solutions for the thermal rehabilitation of the building’s envelope, achieving a decreased heating consumption, below 100 kWh/m²/year.

One of the strong points of the above mentioned Government Ordinance is that it specifies the minimum performance limit for a thermal rehabilitation. However, the Ordinance has a weak point: it does not specify actions for the energy rehabilitation of the building's indoor installations.

Following the implementation of the EPBD, the responsibility of Local Authorities and citizens was increased. Technical measures for better energy performance management of buildings were implemented, including individual metering of heating and hot water, and individual thermal regulation of heating.

Calculation procedures

The calculation procedures for energy performance indicators and energy consumption are defined in the “Thermal regulations” (C107) and in the “Methodology of calculation of the energy performance of buildings - Mc 001/Part 1,2,3,4 - 2006”, available both for new and existing buildings, as well as for residential and non-residential buildings. National databases of typical annual hourly climatic data are to be prepared and published for every municipality in Romania. The software tools, created according to the Mc001-2006, are available on the market.

The Order 1071/2009 supplements the Order 1057/2007 with the procedure for validation of computer programmes used for the calculation of energy and developing energy performance certificates for blocks of flats.

A special theoretical and experimental validation research programme for new and existing calculation methods is currently being carried out, coordinated by the Ministry of Development (2008 - 2010). Within this research programme, a reference software (RS) will be developed. Based on this RS and on a special checklist of results, any alternative method and software product (Romanian or foreign) will be assessed. The intention is to use only certified software products in the design activity.

Present regulations for new buildings are limited to conventional buildings; some new and efficient solutions are omitted (e.g. solar passive systems, active solar systems, endothermic facades, phase change storage structures, etc.).

Quality assurance (QA)

The Quality assurance scheme is still under development, addressing training and examination of individual experts, validation and certification of software used for the processing of EPCs. EPCs are issued and registered in a central database, based on analysis of issued documents or possible in situ checks, as well as on calculation of the energy performance of buildings. For repeated errors, the auditor’s license can be cancelled.
3 > Inspections - Status of implementation

Inspections are a substantial part of the energy audit of a building. The inspection of boilers and air-conditioning systems is, however, still at an early stage. The regulation for periodic inspections of boilers, heating systems and air-conditioning systems is being processed. A guide for each type of inspection will be available in early 2011.

The procedures for inspections will follow the European norms and specific national regulations. The implementing rules of the Law No. 372/2005 stipulate that energy inspections of boilers, thermal power plants and heating plants of buildings must be carried out by technical experts certified in heating and ventilation specialty.

4 > Qualified Assessors

Qualified experts are the only persons recognised to issue Certificates and carry out inspections. Energy auditors must have all the skills necessary for inspections and system improvement recommendations. They must be qualified engineers or architects with at least three years of experience in dwelling certification only, and five years of experience in certification and audit for all types of buildings.

In addition, qualified experts must attend recognised training courses (short courses of 80 hours or MSc university courses of 1 to 2 years), and pass a demanding national examination that evaluates their knowledge on the technical requirements of the building regulations, and on the details of the certification system itself. The examination has two parts: a theoretical examination and a practical exercise based on a simulation of audit activity (an existing building certification and an audit report for a detailed upgrading solution, combined with an economic efficiency assessment).

The Ministry of Regional Development and Tourism (MDRT) coordinates the training of qualified experts and is responsible for all aspects of the Energy Certification module. Qualified experts are given a professional license, valid for 5 years, which is subjected to renewal with proof of continued training and lack of malpractice. The demanding qualifications of the energy certification auditors is a guarantee of their correct professional attitude and increase the credibility of the certificates.

Qualified experts can act on an individual basis or be integrated in public or private organisations. Recognised courses are already offered by Technical Universities in Bucharest, Timisoara, Iasi and Cluj, accredited by MDRT. More than 1,000 candidates have been trained till September 2010.

In Romania, there are over 1,000 qualified experts in energy performance of buildings, certified to perform certification and energy audit on buildings. The Ministry keeps the list of authorised experts. This list is published in the Ministry's website www.mdrt.ro.

Figure 3 - Qualified expert professional license model
Quality control

Qualified experts are the only persons accredited to issue EPCs. According to the Norms of application of Law 372/2005, every auditor must keep the documents for each certificate in order, and keep a register for all EPCs.

As stated in the norms, a central registration of all EPCs and a national database must be organized by the National Building Research Institute (INCERC Bucharest).

The quality of the EPC is controlled by periodic checks conducted by a commission designated by the Ministry. At least once every 5 years, each expert will be examined by the commission for the evaluation of their correct use of methodologies and tools. About 10% of the certificates will be subjected to this quality check starting from 2011. In case of serious infringement of the EPC process, the control commission can propose to the Ministry the suspending of the license.

Any authority or owner can address the Ministry if there is a doubt concerning the certification compliance with the standards or the national regulation. There is not yet a clear regulation concerning this subject.

5 > National Information and Communication Campaigns

Communication is an essential component in all projects. Also, together with technology and policy, construction standards play a vital role in raising awareness on energy savings and renewable energies. Detailed brochures, as well as official texts, are available on the national websites. Since 2007, promotion and information seminars have been organised on a national basis.

The MDRT website (www.mdrt.ro) provides detailed information on training courses, information campaigns, legislation, technical regulation; it also provides a list of qualified experts. In the future, it will contain a list of valid certificates as well. This site includes the regularly updated national rehabilitation programme provided by the Ordinance 18/2009 - concerning blocks of flats.
The goal of the information campaigns, competitions, voluntary schemes and pilot activities is to promote market penetration of technologies and concepts that keep energy performance under legal requirements, as well as the implementation of the energy efficiency measures in both the private and the public sector.

Another issue is the access to finance - to assist all stakeholders in their projects. In order to raise awareness on the national thermal rehabilitation programme by government credit guarantee and interest subsidy, at the level of owners associations in blocks of flats and single-family building owners, the MDRT has developed an attractive brochure.

6 > National incentives and subsidies

In order to reduce energy consumption in residential buildings, the Government Emergency Ordinance No. 18/2009 was published in the Official Journal No. 155 of the 12th of March 2009. The normative act mainly sets the financing of the performance of works on the insulation of residential buildings constructed in the period 1950-1990, with high energy consumption for space heating:

- 50% from the state budget;
- 30% provided by local budgets;
- 20% from the repair fund of the association of owners and/or otherwise legally constituted entities.

Also, for this category of buildings, local authorities financed the implementation of energy audit and technical design.

Figure 5 - Number of apartments in block-of-flats approved in the National Thermal Rehabilitation Programme

Following the above mentioned experience, and taking into account the provisions of art. 10 of 2010/31/UE Directive, MDRT identified new financial instruments for increasing the energy performance of buildings. In this regard, the Government issued Emergency Ordinance No. 69/2010, published in the Official Journal No. 443 of the 1st of July 2010, which provides directives for obtaining credit for carrying out rehabilitation of housing, with guarantee and full interest subsidy by the Government. With this legislation, credits can be accessed both by tenants’ associations and by single-family building owners.

7 > Impact of the EPBD at national level

The impact of the EPBD at the national level is:

- Effectiveness in promoting energy efficiency improvements.
- Reduction of cost-effectiveness for the end users.
- Influence on the national energy performance requirements of our country and development of new calculation procedures and harmonisation with the level of energy performance for new buildings and major renovations.
The results offered arguments in favour of the tightening of these requirements. Thus, the thermal requirements for new buildings according to the C107/2010 are more improved from those in the C107/2007, and the maximum heating consumption for major residential renovation is defined to 100 kWh/m².year.

- Measurements for energy performance for existing buildings and creation of a benchmarking system under the coordination of the MDRT; this system takes final energy into account and covers the overall result of the energy used for heating, hot water, cooling, ventilation and built-in lighting.
- The advantages of the implementation of the EPBD at national level will be felt also at environmental, economic and social level, and will lead to greater use of renewable energy.
- Less greenhouse gases.
- Less waste.
- Reduction of energy dependence.
- Promotion of green technologies.
- New opportunities for business.
- New jobs.

![Figure 6 - Plans for Green Energy share in buildings](image)

**Figure 6 - Plans for Green Energy share in buildings**

### 8 > Conclusions and future planning

The 2010/31/EU Directive (recast EPBD) and the National Energy Strategy for building planning in Romania are in full agreement, and, therefore, the recast EPBD is a useful legal tool for improving the energy performance of buildings in an effective way for short and medium term:

- Transposition and implementation of the new EPBD (recast).
- Increase of the number and quality of accredited experts.
- Development of a methodology for periodic inspections of boilers and HVAC systems in smaller buildings.
- Start of the supervision/quality control of the certificates issued by qualified experts on a regular basis during 2011.
- Reconvening of the committee that will prepare the revision of the minimum requirements, so that they come into effect 5 years after the publication of the current regulations.
- Start of the assessment and certification of the software products used for the energy assessment of new and existing buildings.
- Introduction of the individual residential buildings into the National Programme for thermal renovation of existing buildings.
- Development of the measurements of energy performance for existing buildings in benchmarking systems.
- Increase of the penetration of renewable energy in buildings.
CEN produced a set of standards in support of the introduction of the EPBD, but they do not cover the whole challenge of the EPBD. Even through CEN standards are not directly implemented in the national energy performance procedures, Romania will continue to use CEN compatible approaches.

The 2010/31/UE Directive, together with construction standards, will ensure that Romanian homes and workplaces will be safe, comfortable, healthy and non-polluting. There is a strong need for flexibility, cooperation, networking and involvement of market actors. The responsible attitude of the energy certification auditors will stimulate more extensive dissemination and credibility of the certificates.

The recast EPBD will further build on the guidance already set by the EPBD, therefore making it possible to meet the specific objectives and accelerate energy efficiency and national use of energy, including, among others, studies, events, training programmes, information campaigns, competitions, voluntary schemes, and pilot activities, in order to provide a fair field for a mature energy-efficiency market.

With every amendment of the energy requirements from the recast EPBD, the MDRT has to take the legal regulation into account, according to which all these requirements have to be economically feasible and create a system for all relevant components for new buildings and major renovations. Therefore, the impact of applying energy performance continues to improve the reduction in energy consumption in the building sector.

In order to progressively involve all existing buildings, energy certifications must be perceived by consumers as a useful tool for the improvement of the energy efficiency of buildings, and to increase transparency within the real estate market.