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Successful EPC schemes in two Member States: An eceee case study

As part of its ongoing work to ensure the EU achieves the full benefits from the Energy Performance of Buildings Directive, eceee has looked in detail at the way two Member States – **Portugal** and **Ireland** – have implemented the requirement for Energy Performance Certification (EPCs). These are contained within Article 7 of the existing Directive[1], or Article 10 of the proposed recast[2].

Both countries recognised, at an early stage, the benefits of certification as a tool to improve the building stock – both residential and non-residential. Common features of both schemes are the attention put into the design of the overall system, rigorous criteria for building assessors and the use of national databases to register both assessors and certificates.

Promotional advertisement on Portuguese energy certificate

Greening Portugal's building stock

"*One day, all buildings shall be green*" . That is the bold claim of ADENE, the Portuguese Energy Agency with responsibility for administering Energy Performance Certificates (EPCs) throughout Portugal.

As of June 2009, more than 100,000 certificates had been issued since the scheme was launched in July 2007, in response to the requirements of the EU Energy Performance of Buildings Directive (EPBD). About 80% are for existing buildings issued since January 2009, when the scheme was extended to existing buildings – previously, certificates were only required for new buildings.

Certificates, which cover indoor air quality as well as energy performance, are based on the now-familiar A-G format seen on household appliances such as refrigerators and washing machines. The only difference is that classes A and B are evenly subdivided into A+/A and B/B- respectively, to improve the distinction among new buildings, where the minimum building regulation requirement is equivalent to a B-.

[1] http://eur-lex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexplus!prod!DocNumber&lg=en&type_doc=Directive&an_doc=2002&nu_doc=91

[2] http://ec.europa.eu/energy/strategies/2008/doc/2008_11_ser2/buildings_directive_proposal.pdf

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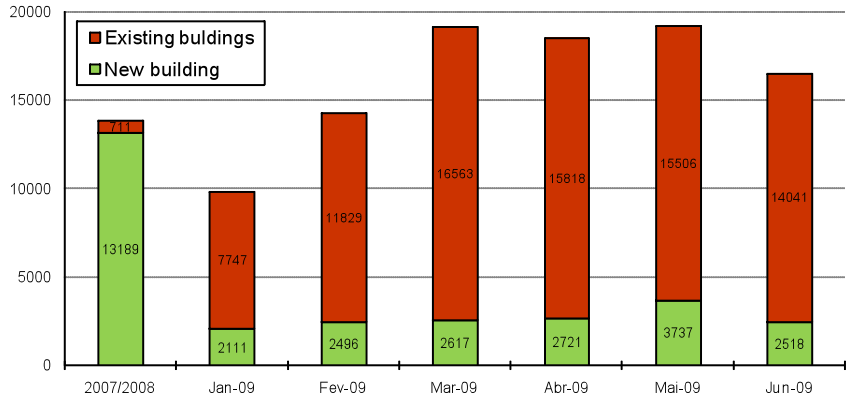
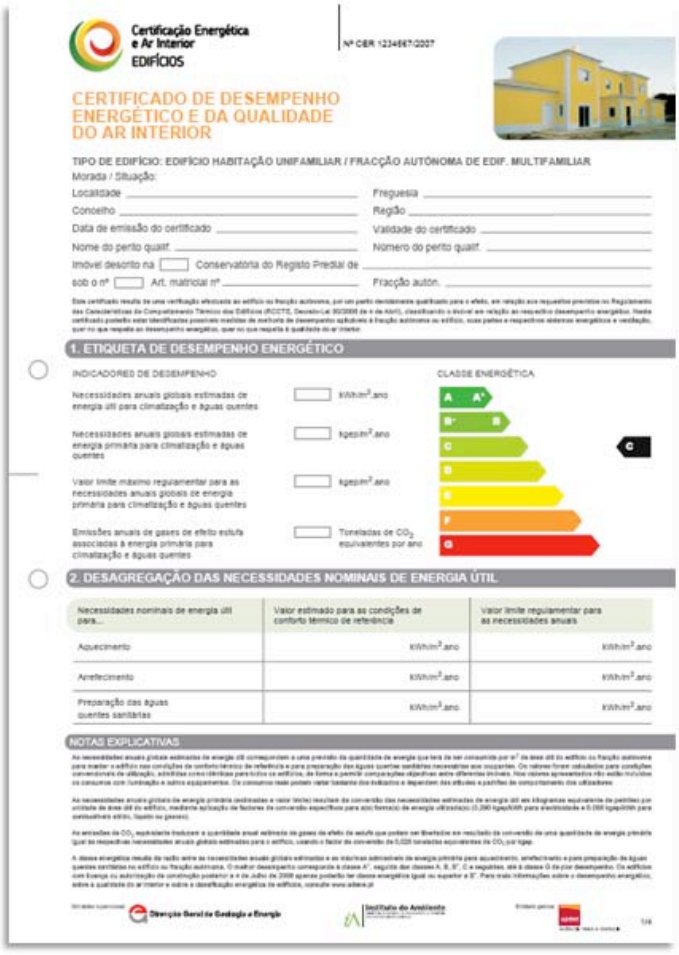
Energy saving potential

The real benefit of the EPC is in the recommendations provided to the building owner. These are summarised on the reverse of the certificate. As illustrated below, the information includes a short description of the recommendations, estimates of costs, savings and paybacks, and the impact on the energy rating if all measures were implemented.



Number of EPCs for new and existing buildings in Portugal


Certificação Energética e Ar Interior
EDIFÍCIOS

CERTIFICADO DE DESEMPENHO ENERGÉTICO E DA QUALIDADE DO AR INTERIOR

TIPO DE EDIFÍCIO: EDIFÍCIO HABITAÇÃO UNIFAMILIAR / FRACÇÃO AUTÓNOMA DE EDIF. MULTIFAMILIAR

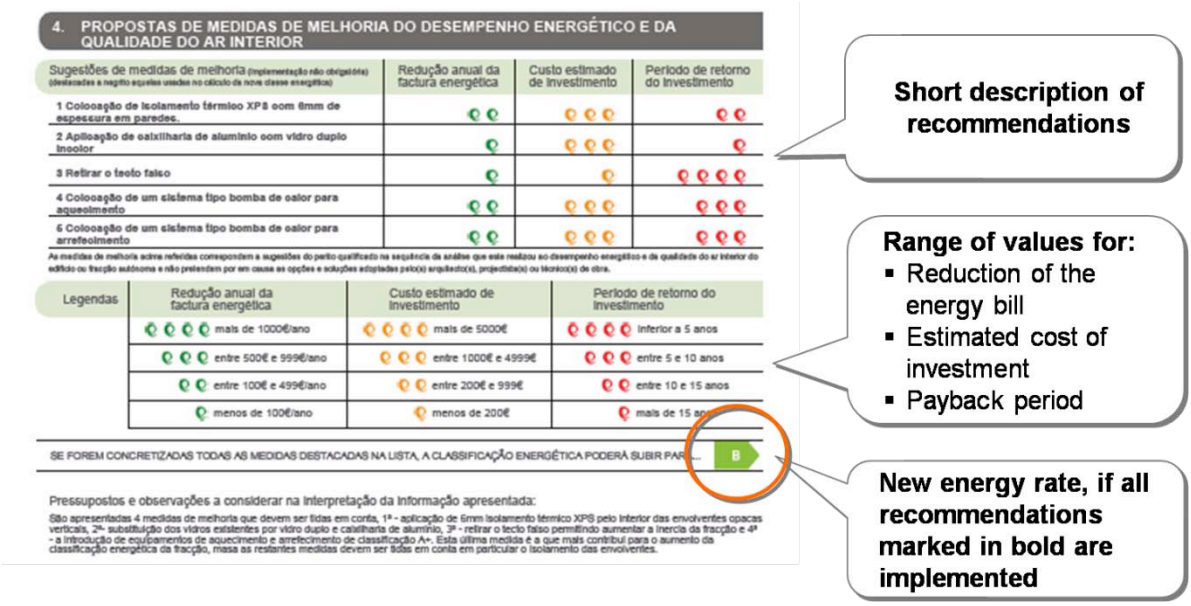
1. ETIQUETA DE DESEMPENHO ENERGÉTICO

2. DESAGREGAÇÃO DAS NECESSIDADES NOMINAIS DE ENERGIA ÚTIL

NOTAS EXPLICATIVAS

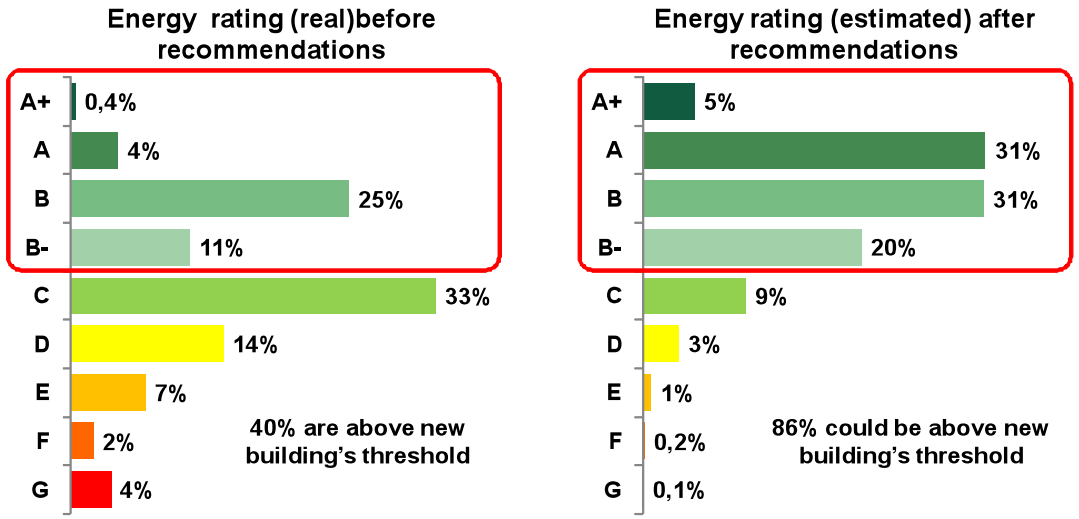
Example of Portuguese energy performance certificate

Analysis of EPCs issued for existing buildings shows that about 40% are rated above the B- threshold for new buildings – see figure below. Potentially, that proportion could increase to 86% if all the energy saving measures were installed. This would require an average investment between €1250 and €6500 per building, with an average payback period of 6 to 11 years.



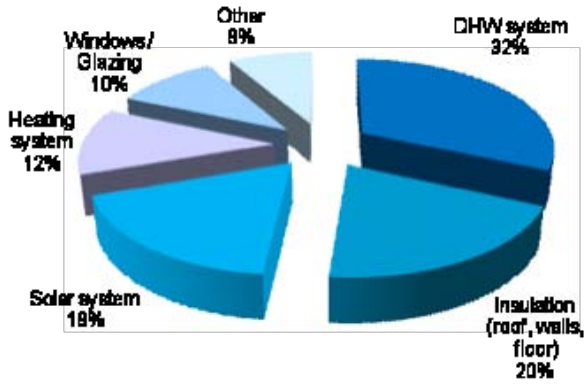
Example of how recommendations are provided on Portugese EPC

Energy savings equate to about 0,4 toe of primary energy per building per year. To help realise these investments, the Portuguese government has established a framework for financial support to specific measures.



Expected impact from Portugese EPC recommendations

The breakdown of savings potential by measure type is illustrated in the pie chart. The three measures with the largest energy saving potential are: improvements in the Domestic Hot Water (DHW) system; insulation; and solar heating.

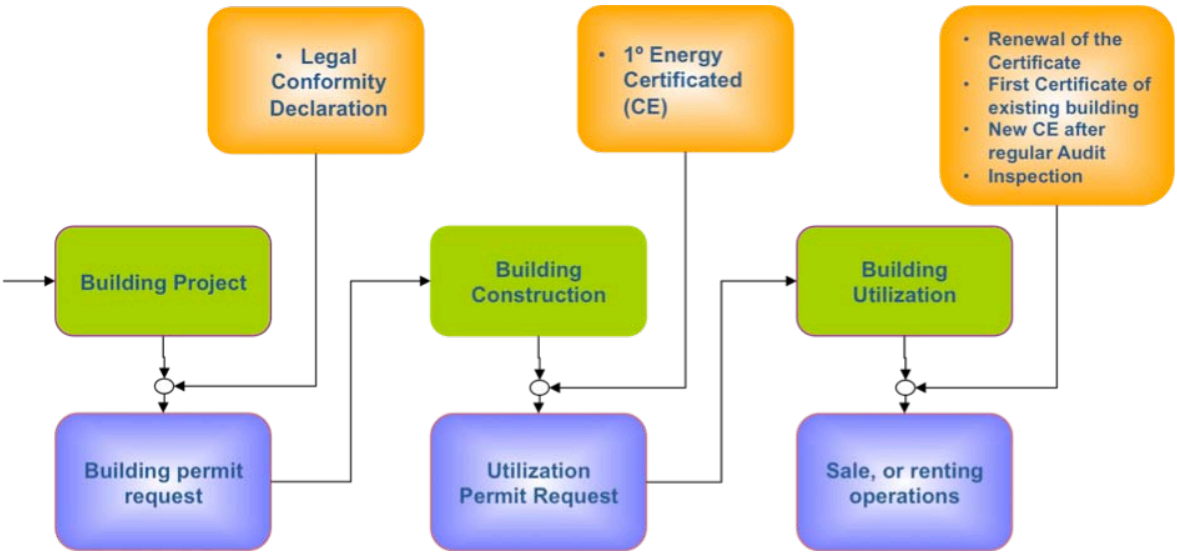


Potential impact by measure from Portugese EPC recommendations

Administration and promotion

The success of EPCs in Portugal is largely down to the efforts of ADENE, the national energy agency administering the scheme. ADENE worked hard to explain the certification process to municipalities and other stakeholders. Now, practically all municipal services have included the certificate in the list of documents required in a licensing process. For new buildings, the system has been established in a way that municipalities don't have to perform any technical verification - this is done by the qualified expert. In another step to ensure quality standards are maintained, ADENE check a proportion of the certificates issued by qualified experts.

The schematic below gives a simplified illustration of the process for certification of new buildings, from the point that the building is conceived up to first occupation, sale, or renting.



Schematic description of the certificate process in Portugal

For the residential sector, ADENE engaged with the key players involved in home buying and selling (notaries, estate agencies, banks, etc.) to ensure they were aware of changes and to get their involvement and support to certification. These and other actions provided a suitable framework that allowed a fast adoption of certification.

Requirements for existing non-residential buildings

EPBD currently requires owners of public buildings larger than 1000 m^2 to prominently display an energy certificate at the main entrance. Portugal has chosen to impose this

requirement on ALL non-residential buildings above this threshold, whether owned by private or government bodies.

If the primary energy consumption of an existing non-residential building, based on actual fuel bills and covering all types of energy use, exceeds a certain level fixed by the HVAC[3] regulations, an energy efficiency plan must be prepared and all measures with payback shorter than 8 years must be implemented over a three years period. Also, if indoor air quality parameters exceed stated limits, a corrective plan must be prepared and put to action by the building owner.

Quality control and compliance

Certificates can only be issued by suitably qualified experts, who must register all EPCs on a web based central registration system. This national database is invaluable in enabling monitoring of progress with building certification and assessing the energy and carbon savings that can be achieved from implementation of recommended measures. It will also inform the periodic revisions of the technical regulations, where tightening of minimum requirements and improvements in operational rules are considered. The fact that most new buildings achieve an A rating indicates there is scope for tightening this requirement.

Certificate of qualified expert in Portugal

Compliance rates with the scheme are high. The monthly average of 3,000 certificates for new buildings and 15,000[4] certificates for existing buildings represent well over 90% of building completions and transactions, when compared against other Government data sources. The only area where compliance is still low is the rental market, though this market is much smaller than building sales.

Good compliance was achieved, in part, through the promotional and educational efforts of ADENE in bringing the key market players up to speed with the legislation, and in part through the penalties and sanctions for building owners and qualified experts in case of non-compliance. Penalties range from €250 to nearly €45,000.

To ensure the quality of EPCs, ADENE check a proportion of certificates issued. This entails visiting the site and performing a parallel analysis of the certified building. By the end of 2009, ADENE aim to inspect nearly 4% of the certificates issued each month. If mistakes are detected, the expert is asked to correct the certificate and is also subject to penalties.

An additional and lighter control is also performed by ADENE in the form of random checks on the content of the certificate. In case there is wrong or inconsistent information in the certificate, a detailed quality check can be triggered. But in most

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[3] Heating, Ventilation and Air Conditioning

[4] At an annualised rate, this equates to roughly 3.5% of the 5.5M existing buildings in Portugal. At this rate, it would take over 30 years for all buildings in Portugal to receive EPCs

cases, this mechanism is used to warn experts about possible improvements in the quality of the information they put in the certificate, thus maintaining quality levels and ensuring greater consistency across qualified experts. Another important task for ADENE is to devise and manage suitable support mechanisms to promote practical implementation of the recommendations made by the experts in the certificates. This ensures that the certificate is not merely a legal nicety – it is a tool to increase the uptake of energy saving measures.

Interview with the EPC scheme administrators

eceee spoke to Paulo Santos at ADENE, the man behind the EPC system in Portugal, to understand more about the scheme designs, key successes and lessons learnt: For further information please see ADENE website. [5]

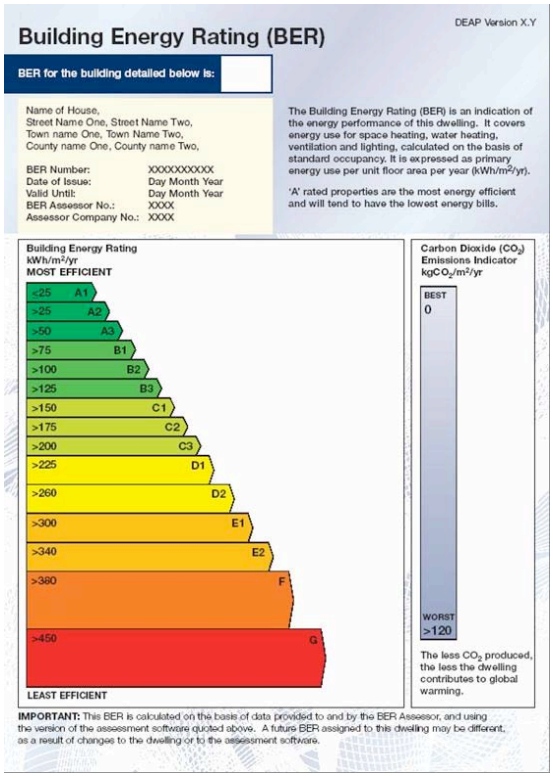
Q1. What was the philosophy behind the approach to designing your EPC system?	The basic concept of the EPC scheme was to have a central web based system (partly public, partly restricted access), that allows simple access and use by three main target audiences: a) **General public**, giving them free access via ADENE's website to part of the EPCs (label and identification of the building). The system generates uniquely numbered EPCs, downloadable as PDF files. b) **Qualified experts** that have specific access to the restricted area, for on-line production of EPCs, thus feeding the central registry with all the useful information for monitoring and evaluation of EPBD implementation; c) **Authorities** (ADENE included) can easily manage the system and monitor progress.
Q2. What were the major barriers you had to overcome?	A strong effort was made by ADENE to promote the EPC system to all the key stakeholders (notaries, banks, municipalities, sectorial associations, professional associations, etc.). This brought attention and a "positive feeling" about the certification process that helped and facilitated market acceptance. The main opponents were from parts of the construction industry, who argued that there were not enough experts and that would cause bottlenecks. Events proved otherwise, as is demonstrated by the smooth flowing process we have in place.
Q3. How do the finances work?	ADENE charges a registration fee for each certificate issued (€45 per household and €250 per non-residential building, plus VAT), which is used to support the management and promotion of the EPC system. Most of the budget is used to pay for the quality check of the experts' work.
Q4. What do you think are the greatest successes of the scheme?	The scheme brought the energy performance of buildings to the common citizen's attention. People are now able to use EPC rating as an additional factor when taking an investment decision (buying their home). It's one of the few administrative processes that provided potentially useful information to the owner of the house, explaining what he/she can do to actually save money and improve comfort.
Q5. What are the key things you'd like to have done differently in hindsight?	Two things. Firstly, a mandatory requirement for qualified assessors to scope out in more detail the energy saving recommendations to include in the certificate would have made it easier for building owners to act on the recommendations. Secondly, defining extra functionality at an early stage of IT development would have enhanced the usefulness of the database as a research and analysis tool.

How Ireland developed its Building Energy Rating scheme

Sustainable Energy Ireland (SEI), Ireland's national energy authority with responsibility for developing and administering the Building Energy Rating (BER) scheme, sees BERs as a "platform to transform the energy performance of the building stock". This philosophy goes to the heart of the way the scheme has been designed, and how it links in with other schemes run by SEI to reduce energy demand in buildings.

Building on a previous Home Energy Rating[6] scheme, BER is a key component of the "Action Plan for Implementation of EPBD[7] in Ireland", which was published in 2006[8].

[5] http://www.adene.pt/ADENE/Canais/SubPortais/SCE/Introducao/Apresenta%c3%a7%c3%a3o.htm



The Energy Performance Certificate in Ireland

It is designed to meet the Energy Performance Certification requirements of the European Directive (article 7). In designing the scheme, SEI were mindful of the need to balance issues of **practicality** and **cost**, with those of **clarity** and **consistency**. This led to a scheme with the following key components:

- A visually impactful certificate with an energy rating, based on the familiar A-G energy label for household appliances. In order to provide greater granularity, energy ratings A-E are further subdivided into two or three categories (e.g. A1, A2, A3, D1, D2) in order to create a label with 15 bands.
- An Advisory Report which accompanies the BER, with information on how to improve the building's energy performance.
- A system for registering qualified and suitably trained Building Assessors.
- A database of BERs and Advisory Reports.
- A quality assurance mechanism, encompassing the Building Assessors as well as BERs.
- Administration and support functions, including financial management, maintenance of website, help desk etc

The aim was to establish an integrated scheme that would serve as a positive instrument of energy policy in Ireland's built environment, and achieving the necessary balance between the above issues was considered vital to the market reputation and effectiveness of the scheme.

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[6] http://www.sei.ie/Your_Building/BER/Legislation_and_Background/Review_of_existing_Home_Energy_Rating_Schemes_1_.pdf

[7] The EU Energy Performance of Buildings Directive

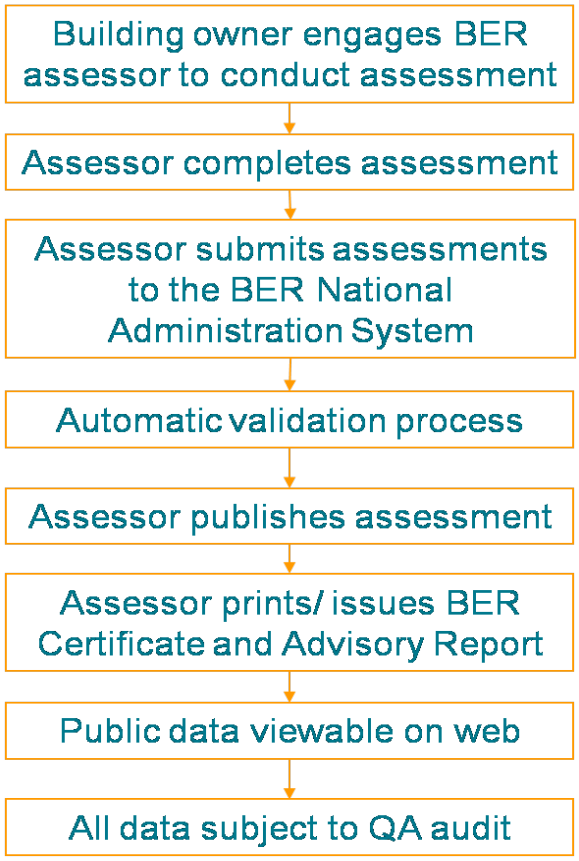
[8] http://www.sei.ie/Your_Building/EPBD/Legislation_and_Background/Action_Plan_26July06.pdf

Design

Given that the number of BERs expected to be issued was at the rate of a few hundred every day, a computerised system was seen as the obvious solution to underpin the whole scheme. The first stage is to register building assessors.

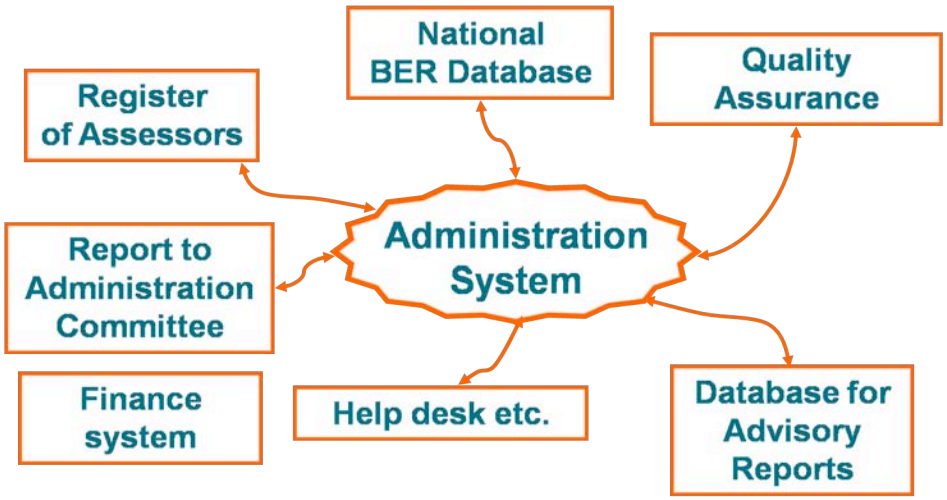
To qualify, assessors must have a relevant background in the building industry, they must satisfactorily complete accredited training and, as from July 2009, they must pass a national examination – these are conveniently held at the 41 driving test centres around the country.

Training providers must themselves be certified to a standard agreed by the NQAI - National Qualifications Authority of Ireland.



The integrated approach for implementation in Ireland

Finally, assessors must sign up to the Code of Practice[9], which includes requirements to act in a professional and independent manner, to comply with the scheme rules and ensure confidentiality.



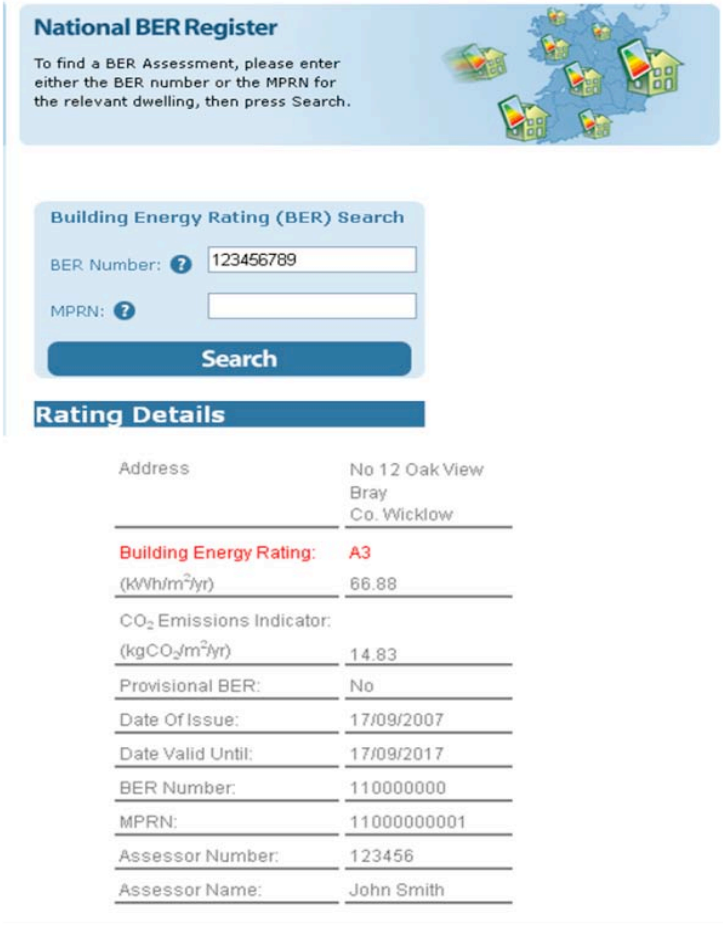
The building energy rating process in Ireland

[9] http://www.sei.ie/Your_Building/BER/BER_Assessors/Code_of_Practice.pdf

A building owner wanting to sell or let a property will then search the BER website (http://www.sei.ie/Your_Building/BER/ for an assessor, who completes the assessment, enters the data into the DEAP (Dwelling Energy Assessment Procedure) software tool and submits it from there onto the BER national database.

The database undertakes an automatic validation process, and then generates the completed BER and Advisory Report[10].

The assessor hands these to the building owner, together with a unique reference number to access the master electronic copy of their BER on the website. This is useful, for example, for solicitors to verify that the BER has been issued, prior to completing any transactions. The BER can also be accessed by providing the electricity Meter Point Reference Number (MPRN) for the property.



From the BER website: How to find a BER assessment

The other main functions of the database are to enable statistical analysis, as well as to facilitate quality control. Audits are taken, both on a random basis and as a result of any unusual or suspect data. Every active energy assessor will be audited at least once in 2009, while the normal schedule of audits is 250 per week. In addition, a number of in-depth audits requiring site visits are undertaken.

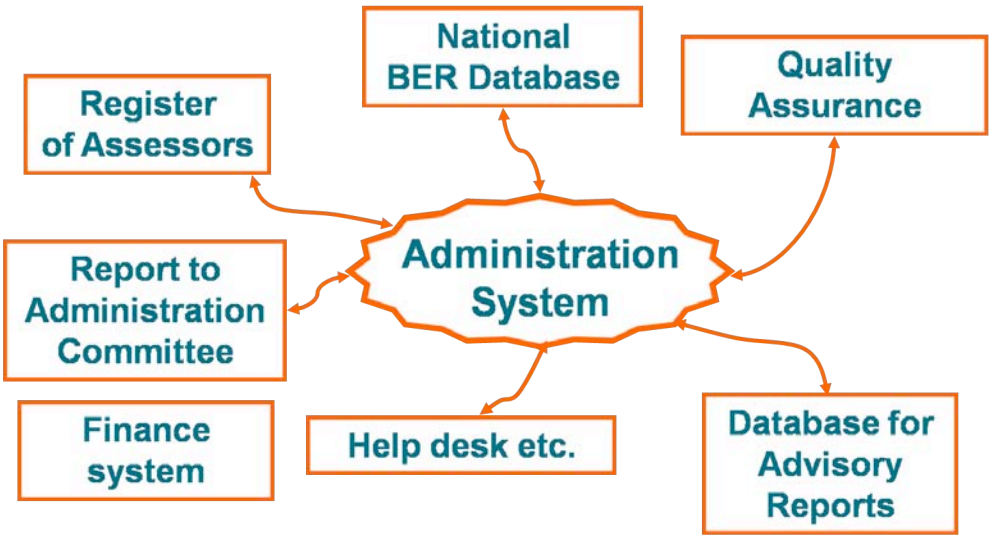
A key consideration was that the administration of the scheme should be revenue neutral. Scheme revenues are raised from, firstly, registration fees for assessors, and secondly, a levy per BER. For domestic properties, the publication levy is currently €25, collected from the assessor. (NB, the average cost of a BER assessment, to the householder, is around €200.) The revenue raised is used to fund:

[10] The underlying software for generating a BER is either the "Non Domestic Energy Assessment Procedure" (NEAP), or the "Dwelling Energy Assessment Procedure" (DEAP), for non-residential and residential applications respectively. This is the same methodology for demonstrating compliance with specific aspects of Part L of the Building Regulations.

- System design and development
- Ongoing support and maintenance
- Quality assurance
- communications and promotion

Legislative context

Responsibility for implementing EPBD within Ireland rests with the Department of the Environment, Heritage and Local Government (DEHLG). However, energy policy is with the Department of Communications, Energy and Natural Resources (DCENR).



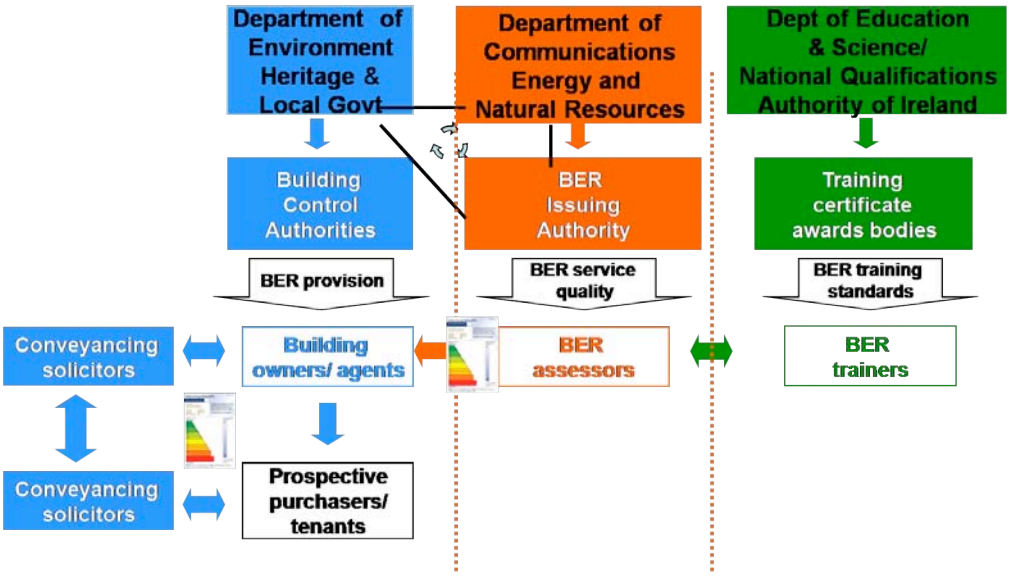
SEI, which was appointed as the Issuing Authority for BERs, is sponsored by DCENR. SEI can impose reasonable sanctions on non-compliant assessors, but has no power of enforcement if an owner fails to procure a BER when putting a property on the market – that responsibility rests with the Building Control Authorities who report into DEHLG.

Complementing these two departments are the Department of Education & Science (DES) and National Qualification Authority of Ireland, which has responsibility for maintaining the quality of training. The relationship between the three principal Government Departments and the NQAI, (collectively, the Implementation Group), together with their formal responsibilities in connection with the issuance and enforcement of BERs, is summarised in the diagram below.

Results

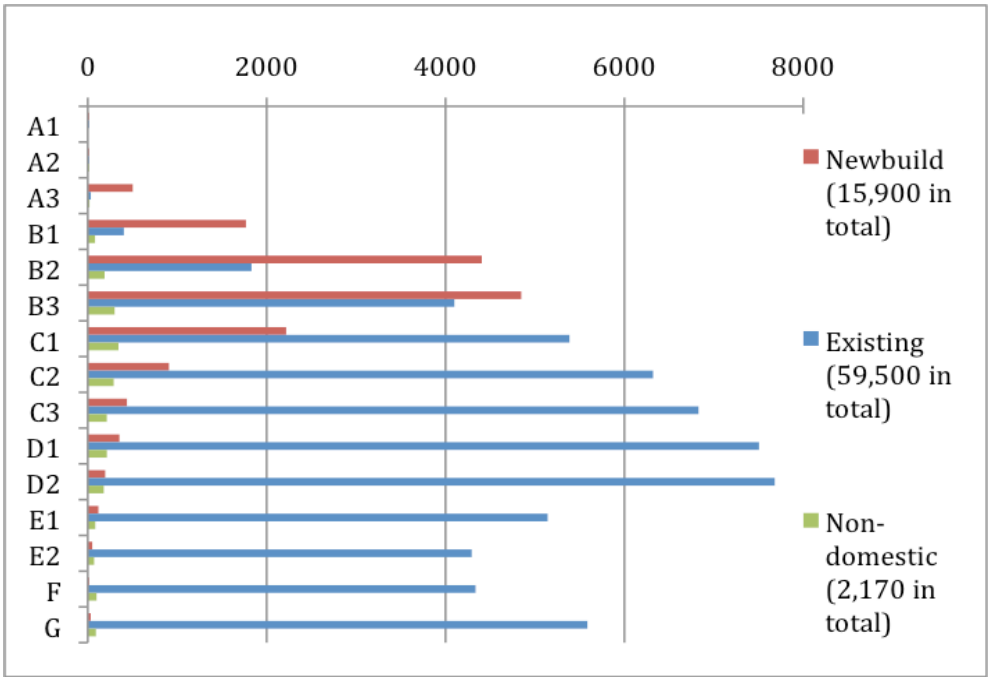
BERs became mandatory for all property transactions – both residential and non residential – from 1st January 2009. Prior to this date, they were required for all new homes (since January 2007) and for new non-residential buildings (July 2008). The rating must be provided at the time the property is put on the market, whether for sale or rent.

To date (October 2009), over 75,000 domestic BERs and 2,000 non-domestic BERs have been issued. The current rate of issuing BERs is around 300/day for domestic, and 10 for non-domestic, while the number of registered and active assessors is 2,500 (domestic) and 200 (non-domestic). The website and helpline (phone calls and emails) together deal with over 20,000 visits/queries a month.



The institutional framework in Ireland for the Building Energy Rating System

The chart shows the spread of buildings assessed by rating. The most common rating for newbuild housing is B2-B3, for existing housing is D1-D2, and for non-residential properties is B3-C1-C2.



Total BERs to October 2009 by building category

Kevin O'Rourke (Head of Energy Demand Management at SEI), who was instrumental in the design of the BER system, argues that the real benefit of the scheme is the advisory report, which explains how to improve the energy efficiency of the property, and the investment actions it will help to guide and stimulate. "While it's useful for the building owner to know the energy performance rating of the building, we really want to mobilise the market for delivery of energy saving measures. We felt it was important that the requirement for a building owner to purchase a BER wasn't viewed as simply another administrative cost burden, so we put a lot of effort into designing a system that would deliver the overall objective, which is to reduce carbon emissions from the building sector and reduce energy costs for building owners and tenants."

Tom Halpin (Head of Sustainable Energy Deployment at SEI) is now responsible for overseeing the delivery of the scheme. He has a core staff of around 6 people who manage the day to day activities, though some functions such as call centres, software development and marketing, are outsourced. "The scheme is working very well, with a reasonably high degree of compliance. Revenues from registration fees and BERs are fully recycled into managing and improving the scheme. National marketing, together with targeted campaigns aimed at key actors involved in property transactions, ensures there is a high degree of awareness of Building Energy Rating in Ireland", said Tom.

For further information on Ireland's Building Energy Rating system, please visit the Sustainable Energy Ireland (SEI) website http://www.sei.ie/Your_Building/BER/.

Acknowledgements

eceee would like to express its thanks to Paulo Santos, Head of the Buildings Audit Department at ADENE, as well as Kevin O'Rourke, Head of Energy Demand Management and Tom Halpin, Head of Sustainable Energy Deployment, both at SEI, for their assistance . Material from ASIEPI (Assessment and Improvement of the EPBD Impact www.asiepi.eu), a programme supported by Intelligent Energy Europe, was also used in preparing this case study.