Action Plan for Implementation of the EU Energy Performance of Buildings Directive (EPBD) in Ireland

EPBD Working Group
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Website: www.sei.ie/epbd

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Introduction

The EU Energy Performance of Buildings Directive (EPBD) [2002/91/EC] was adopted on 16 December 2002 and a copy of the EPBD can be referenced in **Appendix I**.

Article 15(1) of the Directive requires that the EPBD is legally transposed by national legislation and generally given practical effect by 4 January 2006. However, Article 15(2) explicitly provides for a longer period – up to 4 January 2009 – for implementing the more complex provisions of the Directive requiring:

- the energy certification[1] (also termed energy rating or energy labelling) of newly constructed buildings, existing buildings (when let or sold) and of public service buildings – Article 7;
- improvement of the energy efficiency of certain classes of boilers and heating installations – Article 8; and
- inspection of certain classes of air-conditioning systems Article 9.

The currently foreseen tasks and associated responsibilities for implementing the EPBD in Ireland are set out in this Action Plan. The proposed timetable for the phased implementation of the EPBD in Ireland is presented in **Appendix II**. It should be noted that uncertainties exist in relation to some of the timeframes for various tasks set out in the plan. This is mainly due to the interdependent relationships between different sets of tasks.

In addition, while estimates of the scale of the financial and human resources required to implement the Action Plan are included, these cannot be definitively determined across the full range of tasks at this point. Such details will be expected to emerge *inter alia* from the findings of national studies to be commissioned through Sustainable Energy Ireland (SEI) and analysis and experience from other Member States.

This Action Plan sets out the proposed national arrangements and series of development tasks required to implement the EPBD in Ireland. It has been written with the aim of achieving full implementation of the EPBD in a workable and cost-effective manner.

A draft version of this Action Plan was published on 27 April 2005 and was open to public consultation for a three month period ending 29 July 2005. In total, 66 written submissions regarding various aspects of the Draft Action Plan were received. Moreover, a total of 46 information and consultation meetings were held with a wide range of interest groups across the country over the period January to December 2005. Feedback from these events and submissions, together with the findings of commissioned studies, and perspectives and experiences from other Member States, were taken into consideration in the production of this definitive Action Plan. A list of written submissions received is provided in **Appendix III**.

A list of national studies commissioned to date by SEI to inform the EPBD implementation process in Ireland is provided in **Appendix IV**. Studies completed thus far can be downloaded from www.sei.ie/epbd.

[1] Throughout this document the term Building Energy Rating (BER) is used to denote the concept of energy certification of buildings as required by the EPBD.

This Plan will be subject to further periodic review and updating in the light of:

- the findings of further national technical projects/studies commissioned by SEI, over the period to 2009;
- the perspectives and experiences of other EU Member States in planning and implementation of the EPBD; and
- progress achieved.

Section 1: EU Energy Performance of Buildings Directive (EPBD)

1.1 Background to EU Energy Performance of Buildings Directive (EPBD)

Arising from the *Kyoto Protocol*, the EU has set the reduction of greenhouse gas emissions as an important objective. The most significant greenhouse gas is CO_2, primarily from energy use, and over 40% of such emissions derive from energy use in buildings. Research has indicated that CO_2 emissions from buildings across the EU could be reduced by 22% through improved energy efficiency.

The EU adopted the Energy Performance of Buildings Directive [2002/91/EC], known as the EPBD, on 16 December 2002. The EPBD was published in the EU Official Journal on 4 January 2003. A copy of the EPBD can be referenced in **Appendix I**.

The EPBD contains a package of mandatory measures designed to secure a significant reduction in CO_2 emissions from buildings. It will make a significant contribution to the implementation of the *National Climate Change Strategy - Ireland* (October 2000), particularly with regard to Chapter 6 (Built Environment and Residential Sector).

1.2 EPBD Working Group

A joint Working Group, established in 2003 to oversee and plan the implementation of the EPBD in Ireland, has met on 9 occasions up to December 2005. The EPBD Working Group comprises of senior officials drawn from:

- Department of the Environment, Heritage and Local Government (DEHLG);
- Department of Communications, Marine and Natural Resources (DCMNR); and
- Sustainable Energy Ireland (SEI).

SEI provides secretarial services for the Working Group and in this capacity has taken the lead role in drafting this Action Plan. SEI is also supporting and funding the development of practical measures required for implementation of the EPBD including:

- drafting of Building Energy Ratings (BER) and related Advisory Reports on how to upgrade the energy performance of buildings;
- development of calculation/ inspection procedures and systems required in relation to energy assessment, BER, boilers and air-conditioning systems;
- development, maintenance and upgrading of centralised national data in relation to buildings rated and facilities inspected pursuant to the Directive;
- determination of qualifications, training and quality assurance for assessors and inspectors in consultation with relevant training authorities and professional bodies;
- publicity / promotional measures to promote awareness of the requirements of the EPBD, and consultation with interested parties on implementation issues.

1.3 EPBD Implementation Group

Following publication of this Action Plan, it is proposed to establish a joint Implementation Group to oversee the bringing into effect of the measures set out in the plan, to report on implementation and to carry out periodic reviews of the plan. This group will replace the EPBD Working Group and will be similarly composed. The group will meet on a quarterly basis.

It is anticipated that specialist sub-groups drawing on external professional, technical and market expertise will be formed to enable effective implementation of specific provisions within the Action Plan.

1.4 Key Principles in Implementation

In planning the implementation of the EPBD in Ireland, the EPBD Working Group has been guided by 4 key principles. These are:

1. ***Practicality***

   The services should be deliverable through the channels of existing professional and trade expertise. They should require a moderate level of training and upskilling of service providers with prior foundational skills. They should be geographically accessible, entail quick turnaround services at acceptable cost, and not retard normal market activity. The information and advice produced by service providers should be sufficient to enable owners and consumers to exercise informed choices and avoid excessive detail.

2. ***Clarity***

   From the owner or consumer perspective, the delivered information, its purpose and value should be clear. From the service provider perspective, the procedures and tools should be easily understood and as simple as possible to apply. Information and Communication Technology (ICT) systems should be exploited to achieve user friendliness in the process and results, underpinned by appropriately powerful technical resources and reliable administrative support systems.

3. ***Consistency***

   The measures should be of credible quality and value. Relative or comparative accuracy of the information provided is the goal, sufficient to enable resultant consumer choice. Results should be repeatable to an acceptable tolerance. Details of the technical methodologies being applied should also be transparent to inspection by specialists and regulators. The procedures must be underpinned by robust training, validation of tools and skills, quality assurance, and ongoing data and other technical support. The administration systems, engaging best practice in ICT systems, should co-ordinate and maintain these functions.

4. ***Cost efficiency***

   Related to all the above, services should be provided at as competitive a cost as possible, while complying with the obligations of the EPBD. They must not place an undue burden of time or complexity on either the service user or provider.

The EPBD Working Group would urge that these principles be borne in mind by all interested parties throughout the process of appraising and delivering on the detailed tasks identified in this Action Plan.

1.5 Time Scale for Implementation of EPBD

Article 15(1) of the EPBD required the Directive to be legally transposed and generally given practical effect no later than **4 January 2006**.

A key underlying factor in relation to the implementation of the provisions in respect of energy performance requirements and their application to new and existing buildings and to building energy rating (BER) is the establishment of an official methodology (or accepted methodologies) for the calculation of energy performance in buildings. Similarly, methodologies are required for the inspection of heating and ventilation facilities under the terms of the Directive. Recognising this, the EU Commission undertook to support the European Standards Organisation[2] (CEN) in preparing relevant standards and encouraged Member States to adopt a harmonised approach, as far as possible. Ireland has supported this approach and has indicated its disposition to using these CEN standards, when developed, insofar as they appear appropriate.

The aim of CEN originally was to have all relevant standards available as drafts for consultation by December 2004. This timescale was not met, and all draft standards were ultimately issued to the national standards authorities at the end of August 2005. The final versions are expected to be published by the end of 2006, at the earliest. Moreover, these standards will generally not be in a form suitable for direct application and will require considerable national input before they can be used operationally.

It was decided by the EBBD Working Group that for residential[3] buildings, work on expediting the development of a national methodology for energy performance assessment would proceed in advance of publication of such standards. The approach taken in this work has been to review and adapt methods already in use in Ireland and other Member States. The aim is to achieve earliest possible take up of the method by practitioners, for regulatory compliance and BER purposes, and thus enable key provisions in the Directive to be fulfilled in the market place.

Likewise, work on a methodology for non-residential buildings will proceed in advance of CEN standards publication and a comprehensive energy performance requirement will take effect when this methodology is finalised. This is more complex than for the residential sector and requires a longer timeframe. In the meantime, upgraded energy performance requirements are being introduced through the Building Regulations covering the main factors governing energy use.

Article 10 of the Directive provides that BER, and the drafting of associated recommendations, must be carried out in an independent manner by qualified and/or accredited experts. Article 10 makes similar provision in relation to the inspection of boilers/heating systems and air-conditioning systems. Recognising the possible lack of such experts in many Member States, Article 15(2) provides for the

[2] Formally known as "Comité Européen de Normalisation" (CEN) or the "European Committee for Standardisation".

[3] In this document the term "residential building" refers to dwellings, i.e. dwelling house, apartment or flat. It does not apply to other buildings used as living accommodation on an institutional or temporary basis, e.g. hospitals, nursing homes, schools, hotels, hostels, halls of residence.

option of an additional 3-year period (ending **4 January 2009**) for giving practical effect to provisions regarding:

- Building Energy Rating (BER)[+] – Article 7,
- Measures to improve efficiency of boilers and heating installations – Article 8, and
- Inspection of air-conditioning systems – Article 9.

Ireland, in common with many Member States, does not have a tradition of BER, as required by Article 7. Similarly, there is no tradition of regular inspections of the kind sought by Articles 8 and 9. Thus, implementation of these articles will require the development and delivery of major training and accreditation programmes for a large number of independent experts, e.g. possibly as many as 2,000 registered assessors could be required, on a phased basis by 2009, for the Building Energy Rating (BER) of newly constructed residential buildings and of existing residential buildings when offered for sale or letting. A proportion of these assessors may also assess less complex non-residential buildings. A much lower number of BER assessors will be required to assess the more complex non-residential buildings and although they will be expected to have a higher level of prior relevant expertise, it is also envisaged that they will require additional training to become certified to carry out energy ratings for particular categories of buildings, when the relevant methodology / rating system is agreed.

A preliminary analysis of the number of BER assessors required for the residential sector is set out in **Appendix VI**.

These training programmes must be preceded by a range of relevant technical developments which will largely determine their content and timing. For example, in the case of BER, these technical developments will include:

(i) development and adoption of methodologies, as indicated above, for the calculation of energy performance for new and existing buildings in accordance with Article 3 of the Directive;

(ii) consequential development of BER labels together with the basis for recommendations regarding priority cost effective energy conservation improvement works (Advisory Reports);

(iii) development of appropriate software systems to assist assessors in evaluating different building types and in producing BERs and Advisory Reports; and

(iv) development of a national database capable of handling in excess of 150,000 BERs per annum, and generating national data on the results of BER activity.

These factors, to a large degree, limit the scope for early implementation of Articles 7, 8 and 9 of the Directive and mean that the provisions of Article 15(2) will, of necessity, be availed of by Ireland.

It is understood that as of 31 January 2006, 10 of the 25 EU Member States had notified the EU Commission of partial or total transposition of the EPBD. All 10 notifying Member States, including Ireland, indicated their intention to invoke Article 15(2) to defer the implementation process beyond 4 January 2006.

[+] Throughout this Action Plan, the term Building Energy Rating (BER) is used to denote the generation and provision of an energy performance certificate of a building, as defined in Article 2 of the Directive.

1.6 Key Requirements and Proposed Implementation Timetable - Summary

Proposals for legal transposition and phased implementation of the EPBD in Ireland, over the period 2005 – 2009, are set out in Section 2. The implementation proposals, as they relate to the main requirements of the Directive, are summarised below. An overall timetable covering the period 2004 – 2009 is detailed in **Appendix II** and it will be noted that considerable technical research and systems development work must precede practical implementation of the Directive in its entirety.

While this timetable is challenging, it is far from exhaustive in its detail, and contains uncertainties arising from the interdependent relationships between different sets of tasks, and from issues that may possibly emerge in the course of investigation and development. However, it is considered to represent a pragmatic balance in terms of meeting the obligations set out in the EPBD and of according with the principles outlined in Section 1.4 above. It aims to provide a roadmap to implementing the Directive in a manner that is not just formally complete but is ultimately successful in its impact.

The following summarises the key requirements of the EPBD and the relevant implementation proposals for Ireland:

1. Building energy performance standards [Articles 3, 4 and 5]

EPBD Requirement:
Minimum standards for both new build and major refurbishment of existing buildings must be based on the framework methodology laid down in the Annex to the Directive. Under the EPBD, these standards must be reviewed at least every 5 years.

Proposal for Implementation in Ireland:
For Ireland, the Building Regulations Part L and Technical Guidance Document (TGD) L have been and will continue to be reviewed on a phased basis, as follows:

Phase 1 (2005/2006):

- In **December 2005**, the Minister for the Environment, Heritage and Local Government signed the European Communities (Energy Performance of Buildings) Regulations 2005 (S.I. No. 872 of 2005) amending Section 3 of the Building Control Act 1990 to enable the Minister to make Building Regulations transposing the EPBD.

- The Minister then signed the Building Regulations (Amendment) Regulations 2005 (S.I No. 873 of 2005). These regulations amend Part L (Conservation of Fuel and Energy) of the Building Regulations to provide the statutory basis for the introduction of a revised methodology for building energy performance assessment (involving the setting of a CO_2 emissions target) for new dwellings commencing on or after **1 July 2006**, in accordance with Articles 3-5 of the EPBD.

- SI. No. 873 of 2005 also sets higher thermal performance/insulation standards for new non-residential buildings or material alteration of existing non-residential buildings commencing on or after **1 July 2006** – following public consultation on these standards.

- A transitional exemption will apply to buildings for which planning permission is applied on or before **30 June 2006** provided substantial work

has been completed by **30 June 2008**. A transitional exemption of 3 years is a normal feature of major changes in the building code and is intended to avoid delaying commencement of work on building projects at an advanced stage of design or planning. In this case, the transitional period has been reduced to 2 years in order to secure earliest possible compliance with the EPBD. A shorter transitional period would not be feasible because of the need for the construction industry to adapt to the revised building energy assessment methodology for new dwellings.

- The 2006 edition of Technical Guidance Document (TGD) L, on how to comply with the amended Building Regulations Part L, was published in **May 2006**. TGD L makes specific provision for energy performance standards applicable to all material alterations of existing buildings.

- SEI published the methodology for building energy performance assessment of new dwellings in **June 2006**. This methodology is adapted from the Standard Assessment Procedure (SAP) used for some years in the UK, and follows consideration, by independent consultants, of methodologies used in a number of EU Member States - which generally align with European standards (EN 832 and prEN13790). The method will be to be known as Dwellings Energy Assessment Procedure (DEAP).

- SEI published spreadsheet software to help designers and builders to make calculations using the new methodology for the purposes of demonstrating compliance with the Building Regulations Part L in **June 2006**.

- SEI will publish software to help designers and builders to make calculations using the new methodology for the purposes of demonstrating compliance with the Building Regulations Part L, as well as generating BERs (Article 7) by **end 2006**.

Phase 2 (2007/2008):

- Setting energy performance assessment methodology for new non-residential buildings, in accordance with Articles 3-5 of the EPBD - to be operative from **1 July 2008**.

2. Feasibility assessment of alternative energy systems for large new buildings over 1000 m^2 (approx. 10,800 square feet) [Article 5]

EPBD Requirement:
The technical, environmental and economic feasibility of alternative energy systems (e.g. renewable energy systems, CHP, district/block heating, heat pumps) must be considered before construction – either on a case by case basis or by reference to the results of recognised feasibility studies for various building categories, e.g. schools, hotels.

Proposal for Implementation in Ireland:
A national study has been commissioned by SEI aimed at providing generic reference resources for design teams in relation to the options for integrating alternative energy systems into new buildings over 1,000m^2. This will include the development of a software tool, which will be made freely available to assist designers in addressing this requirement of the EPBD. The requirement to take account of these technologies will be implemented from **1 January 2007**. Enabling legislation is contained in Section 5 of the Building Control Bill, 2005.

3. Minimum energy performance standards for major renovation of large buildings (over 1,000 m^2) [Article 6]

EPBD Requirement:
Minimum energy performance standards must be set for major renovation of large buildings (over 1,000 m^2). "Major renovation" is not defined in the Directive proper, but Recital (13) of the Preamble to the EPBD refers to major renovations in terms of cases where:

1. the estimated cost of the works exceeds 25% of the market value of an existing building, excluding the land value; or

2. more than 25% of the building shell undergoes renovation.

Under Article 6 of the EPBD, minimum energy performance requirements, which are technically, functionally and economically feasible, must be applied to the building as a whole or to the renovated building components or systems.

Proposal for Implementation in Ireland:
There are practical problems in seeking to define and enforce "major renovation" by the approach indicated in Recital (13) to the EPBD. "Material alteration" is defined in Article 11 of the Building Regulations 1997 (S.I. No. 497 of 1997) as follows:

"For the purposes of this article, "material alteration" means an alteration (other than a repair or renewal) where the work, or any part of the work, carried out by itself would be subject to a requirement under Part A* or Part B*"

*Part A of the Building Regulations relates to structural standards and Part B relates to fire safety.

The foregoing definition is deemed to effectively include all major renovation envisaged by Article 6 of the EPBD. Accordingly, it is proposed to rely on the existing definition of "material alteration" to apply to all works covered by "major renovation". As allowed by Article 6, of the EPBD, it is proposed to confine the scope of energy performance requirements to the building components or systems being renovated.

As already indicated, the 2006 edition of TGD L will make specific provision for energy performance requirements applicable to material alterations of existing buildings. Therefore these requirements will apply from **1 July 2006.** However, transitional arrangements will apply where planning permission is necessary for the works.

4. Building Energy Rating (BER) – Newly constructed buildings and existing buildings, when let or sold [Article 7(1)]

EPBD Requirement:
A BER from a suitably qualified assessor acting in an independent manner must be supplied to the owner or by the builder/owner/landlord to a prospective buyer/tenant when a building is constructed, sold or let. A BER shall be valid for a maximum of 10 years. The BER is to be accompanied by an Advisory Report containing recommendations for cost-effective improvements to the energy performance of the building.

Proposal for Implementation in Ireland:

For Ireland, the necessary technical and administrative provisions must first be put in place to be followed by the training of the necessary relevant experts, as outlined in Section 1.5 above. For this reason it is envisaged that the requirement for BER will be phased in as follows:

- For new residential buildings from **1 January 2007**, subject to transitional exemptions associated with changes to Part L of the Building Regulations. Transitional exemptions will apply to new dwellings for which planning permission is applied on or before **30 June 2006**. These exemptions will end on **30 June 2008**.

- For new non-residential (including public service) buildings from **1 July 2008**, subject to transitional exemptions associated with changes to Part L of the Building Regulations. Transitional exemptions will apply to new non-residential buildings for which planning permission is applied on or before **30 June 2008**. These exemptions will end on **30 June 2010**.

- For existing residential and non-residential buildings when such buildings are offered for sale or rent from **1 January 2009**.

- The methodologies for energy rating of new and existing residential and non-residential buildings will be developed and published by SEI. The methodologies for new buildings will be the same as those proposed for demonstrating compliance with Part L of the Building Regulations pursuant to Articles 2, 4 & 5 (Ref. Section 4.3).

- A national software package for energy rating of residential buildings will be developed by SEI. For non-residential buildings a national method and validation of other software packages is being considered (Ref. Section 4.7).

5. Prominent display of a BER in existing large public service buildings, over 1,000 m² [Article 7(3)]

EPBD Requirement:
A "public service building" is a building occupied by a public authority and/or by institutions providing a public service to a large number of persons. In such buildings of over 1000 m^2 it will be required that a BER, of not more than 10 years old, is displayed in a prominent place clearly visible to the public.

Proposal for Implementation in Ireland:
For Ireland, it is proposed to research and develop the necessary information, analysis and database facilities to enable public service bodies to fulfil this requirement. Public service buildings will include the following:

- Local Authority Buildings
- Government Buildings
- Buildings under the Office of Public Works
- Swimming Pools
- Libraries
- Schools
- Third Level Colleges
- Hospitals

Implementation is linked to the programme for the introduction of BER requirements outlined above and it is proposed to apply this requirement to new public service buildings from **1 July 2008** and to existing large public service buildings from **1 January 2009**. It is proposed that the BER be displayed in both the English and Irish languages.

- For the purposes of public display of BER, an operational rating is being considered. This would be based on records of actual energy usage rather than information from plans or survey (Ref. Section 4.3)

6. Improvement of energy efficiency of larger boiler systems (with effective rated output of more than 20kW) [Article 8]

EPBD Requirement:
To improve the energy efficiency of larger boiler systems Member States can either (a) introduce mandatory regular boiler inspections of boilers fired by non-renewable liquid or solid fuel of an effective rated output >20kW and of (building) heating systems with large boilers (>20kW) more than 15 years old, or (b) promote best practice in boiler maintenance, use and replacement.

Proposal for Implementation in Ireland:
For Ireland, Option (b) has been chosen and is planned to be in place by **1 January 2008**. This will entail a sustained campaign primarily targeted at domestic boiler users, and, engaging key institutional and industry interests, to promote regular boiler servicing by competent persons in the interests of safety and reliability as well as energy efficiency.

7. Mandatory inspection of air-conditioning (A/C) systems [Article 9]

EPBD Requirement:
Regular inspection of A/C systems with an effective rated output >12kW (which will be almost exclusively relevant to non-residential buildings only), with accompanying advice on possible improvements or alternatives, will be mandatory.

Proposal for Implementation in Ireland:
For Ireland, the necessary technical and administrative provisions, including training of required inspectors, must first be put in place to meet these requirements (see Section 1.5 above). It is planned that these will be in place by **1 January 2008**. The enabling legislation for this purpose consists of Regulations to be made under the European Communities Act, 1972, planned to be made by **July 2006.**

1.7 Buildings Covered by the EPBD – Exemptions

The EPBD will apply to almost all buildings, residential and non-residential, both new and existing. However, the EPBD provides (Articles 4(3) and 7(1)) for the exemption of certain categories of buildings from the minimum energy performance and BER requirements.

Ireland intends to specify building exemptions permitted by the EPBD in the relevant national implementing regulations.

These are likely to include the following categories of buildings:

- Listed national monuments;
- Listed buildings of outstanding architectural or historic importance (now known as protected structures);
- Buildings used as places of worship or for the religious activities of any religion;
- Certain categories of temporary buildings such as those defined in Classes 10 to 13 of the Third Schedule to the Building Regulations 1997 (S.I. No. 497 of 1997);
- Industrial buildings not intended for human occupancy over extended periods and where the installed heating capacity does not exceed 10 W/m^2;
- Non-residential agricultural buildings with low energy demand;
- Small "stand alone" buildings with a total useful floor area of less than 50 m^2.

1.8 Implementation Process - Summary

The national implementation process set out in the remainder of this document covers:

(A) Legal Transposition and Accompanying Measures (Section 2)
Tasks required to transpose the requirements of the EPBD into Irish law, and accompanying measures to facilitate efficient application in the property market.

(B) Institutional Arrangements at National/EU Level (Section 3)
Establishment of and participation in institutional arrangements aimed at efficient and co-ordinated approaches, at national and EU levels.

(C) Technical Systems Development Measures (Section 4)
Detailed proposals for the development of the required technical and administrative systems.

(D) Anticipated Impacts (Section 5)
A summary of the key potential impacts arising from implementation of the EPBD in Ireland.

(E) Consultation, Promotion and Information Campaign (Section 6)
Activities to raise awareness of the EPBD and its implications among institutional, professional and consumer interests.

Section 2: Legal Transposition and Accompanying Measures

The following section sets out the arrangements for the legal transposition and accompanying measures of the EPBD in Ireland.

2.1 Legal Transposition

EU Member States were required to transpose the Directive into national legislation by 4 January 2006.

Building Control Bill, 2005
The Building Control Bill 2005 was published on **22 December 2005**. Sections 4 and 5 of this Bill provide for the legal transposition of the EPBD provisions relating to –

- Building Energy Rating (BER) for (a) newly constructed buildings and (b) existing buildings, when let or sold;
- Mandatory prominent display of BERs in existing large public service buildings (over 1,000 m^2); and
- Consideration of the feasibility of alternative energy systems for large new buildings (over 1,000 m^2) during the design stage.

Building Regulations (Amendment) Regulations 2005
Building Regulations (Amendment) Regulations 2005 (S.I. No. 873 of 2005) were signed on **21 December 2005**. These Regulations provide for the introduction of a new methodology for building energy performance assessment in the case of new dwellings commencing on or after **1 July 2006**[4] as required by Articles 3, 4 and 5 and the Annex of the EPBD.

Part L to the Building Regulations was also amended under these Regulations to incorporate higher thermal performance/insulation standards for new non-residential buildings.

European Communities Act, 1972
The European Communities Act, 1972 provides for the incorporation of European Community law into Irish law by regulation. The European Communities (Energy Performance of Buildings) Regulations 2005 (S.I. No 872 of 2005) were signed under this Act on **21 December 2005**. These Regulations provide for the amendment of Section 3 of the Building Control Act 1990 to allow national Building Regulations, to be made transposing the EPBD.

[4] Note: The operative date of **1 July 2006** is subject to the transitional exemption of new buildings for which planning permission is applied on or before **30 June 2006** and which are substantially completed by **30 June 2008**. This transitional exemption is designed to avoid delays in the commencement of construction of buildings at an advanced stage of design and planning.

In the event that the Building Control Bill 2005 is not enacted by mid 2006, the EPBD requirements contained in this Bill will, as an interim measure, be transposed by Regulations made under the European Communities Act 1972. These Regulations will then be revoked following enactment of the Building Control Bill 2005.

As already indicated, it is proposed that Regulations under the European Communities Act, 1972 mandating the inspection of air-conditioning systems to which Article 9 of the EPBD applies will be made by **July 2006**.

2.2 Phased Application of EPBD Provisions

It is envisaged that the implementation of the EPBD in Ireland will be phased to take account of the necessary chain of tasks in relation to each of its provisions. The proposed phasing is as follows:

2005/2006

- Adopt and implement Phase 1 revision to Part L of the Building Regulations and associated Technical Guidance Document L (TGD L) involving:
  - Revised energy performance assessment methodology, for building code purposes, for new residential buildings;
  - Higher energy performance / insulation standards for non-residential buildings and extension of requirements to cover key aspects identified in the EPBD; and
  - Energy performance requirements for "major renovations" ("material alterations") of existing buildings (including existing large buildings over 1,000 m^2);

- Adopt methodology for BER of new residential buildings; and

2007

- Implement mandatory assessment of alternative energy systems for large new buildings (over 1,000 m^2), with reference to the published findings (including guidelines and software) of the national study for major types of new buildings.

- Implement BER for new residential buildings; and

- Adopt Phase 2 review/amendment of Part L of the Building Regulations/TGD L: setting energy performance assessment methodology, for building code purposes, for new non–residential buildings.

2008

- Implement Phase 2 amendment of Part L of the Building Regulations / TGD L;

- Implement BER for newly constructed non-residential buildings (including public service buildings);

- Implement Phase 1 of measures (2008-2010) to promote boiler and heating systems efficiency; and

- Implement mandatory inspection and accompanying advisory measures for air-conditioning systems.

2009

- Implement BER for existing residential buildings, when sold or rented;
- Implement BER for existing non-residential buildings, when sold or rented; and
- Display of BER in existing large public service buildings (over 1000 m^2).

A proposed implementation timetable covering the period 2004 – 2009 is set out in **Appendix II**.

It will be noted that while considerable technical groundwork has been carried out since 2003, substantial further work of this nature will be required over the period to 2009, before the BER and other schemes can become fully operative to meet the above schedules.

2.3 Vendor Information Pack (VIP) Option

A Home Information Pack (HIP) is being introduced in England and Wales in 2007, under the UK Housing Act 2003. The HIP will include a survey report on the condition of a house offered for sale, a report on the status of the legal title to the property, and will cost the vendor an estimated €900. The introduction of a "Vendor Information Pack" (VIP) in Ireland, modelled on the HIP, was an option outlined in the draft Action Plan published, for public consultation, in April 2005.

Comments received on the draft Action Plan did not evince any strong support for the introduction of a VIP at this time in Ireland; and some comments expressed reservations on the liability/insurance implications for property surveyors.

The Report of the Auctioneering and Estate Agency Review Group (July 2005) recommended as follows:

> "Recommendation No. 28
>
> The Regulatory Authority should at a future date review the case for mandatory seller packs, having regard to the proposed establishment of the Property Registration Authority, computerisation of local authority records and the development of e-conveyancing. The impact of Home Information Packs on the UK property market should also be taken into account, as well as the differing characteristics of the Irish and UK residential property markets."

In the circumstances, it is proposed to give priority in Ireland to solely implementing the requirements of the EPBD regarding the Building Energy Rating (BER) of existing buildings when sold or let, with effect from **1 January 2009**.

Section 3: Institutional Arrangements at National/EU Level

3.1 EPBD Working Group

The activities of the EPBD Working Group are summarised in Section 1.2. The work of this group has been completed and will be carried forward by the EPBD Implementation Group.

3.2 EPBD Implementation Group

The activities of the EPBD Implementation Group are summarised in Section 1.3.

3.3 Energy Demand Management Committee – EDMC (Article 14 Committee)

Articles 11 and 14 of the EPBD provide for the establishment of a committee to assist the EU Commission to "evaluate the Directive in the light of experience gained during its application".

However, the Commission has convened the "Article 14 Committee" earlier than anticipated in order to expedite implementation of the EPBD on a broadly common basis, by providing a medium for dialogue and co-ordination between 25 EU Member States. The title of the Committee is now the "Energy Demand Management Committee" (EDMC). The EDMC generally meets on a quarterly basis.

Three nominated persons (from DEHLG and SEI) attend the meetings of the EDMC.

3.4 EDMC Sub Group Monitoring Development of CEN Standards

CEN is the European Standards Organisation responsible for producing (harmonised) European standards, often on foot of mandates from the EU Commission.

As outlined in Section 1.5, CEN has developed a suite of supporting standards to advanced draft stage (prEN). These standards relate to the methodologies for assessing the energy performance of buildings and for inspection of boilers and air-conditioning systems. They are seen as important resources to facilitate implementation of the provisions of the EPBD by EU Member States, including Ireland, on a harmonised basis.

A sub-group of the EDMC has been formed to monitor the ongoing development of these standards by CEN. An SEI nominee from the EPBD Working Group has been delegated to attend the meetings of the sub-group.

3.5 NSAI Energy Performance of Buildings (EPB) Standards Committee

As the national member of CEN in Ireland, the National Standards Authority of Ireland (NSAI) has established an "Energy Performance of Buildings Standards Committee" (EPB Standards Committee) to review and comment on the draft standards as they are developing. This Committee is drawn from a cross-section of property sector interests and expertise on the energy performance of buildings and building services. Meetings take place in accordance with the emergence of the draft standards and consultation timelines as set by CEN. The NSAI provides the Secretariat to this Committee.

3.6 EPBD Concerted Action Project

With the encouragement of the EU Commission, a "Concerted Action" project on the EPBD has been established, within the EU "Intelligent Energy for Europe" (IEE) Programme. A total of 23 countries, including Ireland, are participating in the project. The main objectives are:

- to provide a forum for exchange of ideas and information for implementation of the EPBD;
- to discuss criteria for implementation of a common methodology for calculation of the energy performance of buildings with similar criteria for simplifications, where possible and desirable;
- to discuss and prepare a common structure for the energy rating of buildings, including a possible nucleus of a common software, to be complemented by national databases;
- to discuss and prepare a common basis for the technical methodologies for inspection of boilers and air-conditioning systems, preferably with part-load efficiency accounted for;
- to share experiences on the training and accreditation of experts to carry out certification and inspections of air-conditioning systems and, where applicable, boilers;
- to consider approaches to positive marketing and engagement of the wider construction and property sector.

Commenced in January 2005, the Concerted Action has been scheduled to run for approximately 2½ years and mainly involves working meetings and structured information sharing on specific technical and administrative issues, comparing and pooling different approaches and experiences across Member States. These are generally accompanied by seminars, which are open to the public for more efficient dissemination of information. Representatives from DEHLG and SEI participate in the EPBD Concerted Action project. The 7th Concerted Action plenary meeting is scheduled to be held in Dublin in **January 2007.**

3.7 Planned Implementation in other EU Member States

Implementation of the EPBD in Ireland will take account of plans for implementation in other EU Member States, as they are developed. As part of the studies (detailed within Section 4) commissioned to inform action in Ireland, the experiences and approaches in several EU Member States, and some other countries, have been appraised.

Given the importance of minimising technical barriers to cross-border trade in construction products and services between Ireland and the UK, the Department of the Environment, Heritage and Local Government (DEHLG) and the Department of Communications, Marine and Natural Resources (DCMNR) will liaise informally with

relevant Departments charged with EPBD implementation in England and Wales, Northern Ireland, and Scotland.

Section 4: Technical Systems Development Measures

It should be noted that the approaches to many of the implementation tasks set out below have been informed by feedback during the consultation process on the Draft Action Plan, by the findings of SEI commissioned studies and by insights gained through the EU EPBD Concerted Action Project (Section 3.6).

4.1 Overview of Implementation Process and Conditions

The key deliverables in the marketplace, as formally obliged under the EPBD, consist of informational and advisory services provided to building owners by independent experts. Article 10 requires that certification of buildings (Building Energy Rating (BER)) (Article 7), inspection of boilers / heating systems (Article 8) and inspection of air-conditioning systems (Article 9) are carried out in "an independent manner by qualified and/or accredited experts". An assessor that has met the specified prequalification requirements, attended an accredited training course, passed the required competency test and has met the necessary quality assurance and other requirements to register as a certified assessor will be considered to be an "independent expert" and will be permitted to carry out Building Energy Ratings for the purposes of the EPBD. Further details on training and qualifications can be referenced in Section 4.15.

It is clear that, prior to bringing BER or inspections into effect, it will be necessary to ensure that adequate numbers of such experts are available to meet the market demands in an efficient and cost effective manner. This requirement cannot be considered in isolation, and is dependent on completion of a series of prerequisite tasks, as explained below.

For BER / inspections to be effectively delivered in the marketplace, three sets of conditions must exist:

- Volume (V): Adequate numbers of assessors / inspectors are active in the market;
- Quality (Q): Assessors / inspectors are of adequate quality (competence);
- Quality Assurance (QA): Adequate quality assurance and administrative systems are in place to co-ordinate and oversee, on an ongoing basis, the reliable operation of these services.

By way of illustration, an overview of the individual sets of tasks and players required to establish BER services in the marketplace, and their interrelationships in contributing to meeting these three sets of conditions, is given schematically in Figure 4.1. Collectively, these constitute an integrated scheme. A similar representation would apply to inspection services.

Figure 4.1 shows the sequence of tasks that must be put in place ahead of establishing these services. The tasks shown as block arrows constitute a supply chain, with the delivery of any individual task being dependent on the preceding task in the chain being complete. For example, in relation to the upper (Volume (V), Quality (Q)) supply line, the presence of adequate numbers of qualified assessors demands that training has been delivered; this in turn demands that a training

syllabus has been put in place, which in turn depends on the development of the software to enable the application of the core methodology. A similar sequential interdependency applies to the lower (Quality Assurance (QA)) supply line.

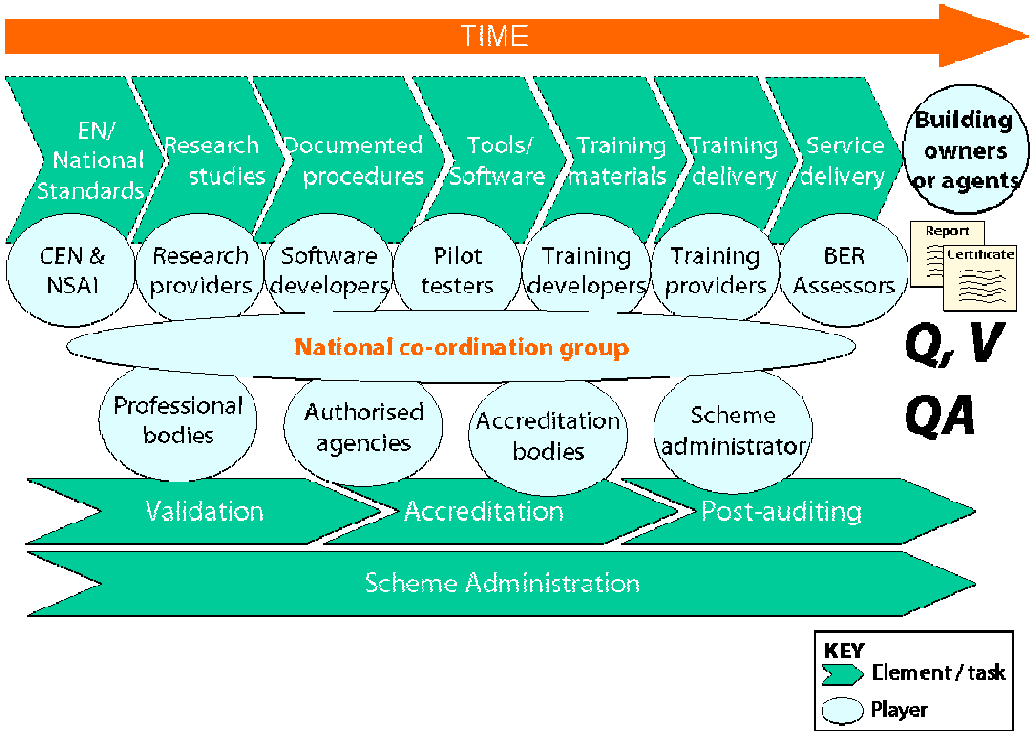

Figure 4.1. Schematic diagram of responsibilities for BER service quality (Q), volume (V) & quality assurance (QA)

The players associated with these sets of tasks are shown as ovals in the diagram. It is clear that active and timely participation on the part of these players will be essential to successful delivery of this integrated scheme.

From the above, it is clear that bringing the scheme into force will require that all the elements are fully in place, in terms of tasks completed, players mobilised and administrative and promotional systems established. The scale and complexity of the work involved will necessitate an incremental, phased approach to implementing the individual requirements of the EPBD over time, availing of the provisions in Article 15(2). The segmentation of these provisions and the proposed schedule of tasks leading to complete implementation are detailed in **Appendix II**.

The main tasks in this series are now considered in turn.

4.2 CEN Standards Development

The EU Commission issued a mandate to CEN to expedite the production of a suite of supporting European Standards (EN) in relation to the methodologies for assessing the energy performance of buildings and for inspection of boilers and air-conditioning systems, as referenced in Section 1.5.

Approximately 30 such standards were identified, spanning 5 CEN Technical Committees. Many of these standards had already been published (as draft or final standards) and were subject to review under this mandate. Other standards were at

various stages of the drafting process and are to be expedited under the mandate. Development of a number of entirely new European standards also formed part of the mandate.

These standards cover technical procedures relating to:

1. Format and presentation of overall energy performance of buildings;
2. Calculation of overall energy performance of buildings (including simplified method);
3. Detailed standards on individual subsystems to support standards referenced in (2) above;
4. Boilers and heating systems;
5. Air-conditioning systems.

A full list of the proposed standards and their status is given in **Appendix V**.

While the citation of CEN standards in national or regional regulations is not obligatory for Member States, they are seen as important resources in facilitating EPBD implementation, as well as encouraging a harmonised approach. Discussions have indicated that many Member States, including Ireland, would be positively disposed towards applying these standards, as appropriate.

The timely adoption of definitive European standards or Euro Norms (EN) by CEN is critical to the timely implementation of the EPBD, particularly for non-residential buildings.

CEN has committed to progressing this suite of standards to completion, or to a sufficiently advanced draft stage to enable actions by Member States linking to such standards to be carried out coherently. The original aim was to have all relevant standards available as drafts (prEN) for consultation by December 2004. This timescale was not met, and all draft standards were not ultimately issued to the national standards authorities until the end of August 2005, with periods for public comment extending to March 2006. The final versions are now expected to be published by the end of 2006, at the earliest, and thus significantly later than the initial EPBD implementation date of 4 January 2006 cited in the Directive.

4.3 Adoption of National Methodologies

With publication of the relevant CEN standards to prEN stage, the EPBD Working Group has been considering whether, and in what way, to take account of the procedures set out in the CEN standards in the official methodologies to be referenced in the national regulations. These methodologies will include the standards relating to the calculation of building energy performance, the presentation of BERs, and inspection and advice in relation to air-conditioning systems and boilers and heating systems.

In order to expedite the implementation of the EPBD, Ireland had indicated a predisposition to adopting/adapting the CEN standards, as far as practicable, and to citing such standards in national regulations. However, as these draft standards have emerged, it has become clear that a number of the key standards are essentially framework and guidance documents and not generally in a form suitable for direct application. Therefore significant further work is required, at national level, to convert the contents of the CEN standards into practical operating procedures that can be applied by building design professionals and assessors / inspectors.

At present, it would therefore appear to be impractical to cite the CEN standards in national regulations both because of the delay in finalisation of the standards and the nature of their content. Therefore additional time, estimated at between 6 and 18 months for different applications, is necessary to allow for the development and adoption of appropriate national alternatives. This is reflected in the proposed timetable set out in **Appendix II**.

4.3.1 Building Energy Performance Calculation Methodology

For the overall BER calculation, some differentiation in treatment will apply between residential and non-residential buildings, and possibly within the diversity of non-residential buildings (e.g. hotels, offices, schools, retail, catering, and hospitals).

In general, calculation of energy performance for the purposes of BER will be based on the characteristics of the actual building, new or existing. It is noted that considerable comment has been received in the consultation process on the draft Action Plan regarding the potential for disparity between a nominal design rating as predicted off plans and an asset rating (based on building surveys) for the building as constructed. For new buildings, it is expected that, for the purposes of design analysis and prediction of the final rating, preliminary ratings are likely to be estimated based on the building plans. Such "design ratings" will need to be reassessed and amended as necessary to ensure that the final BER relates to the actual building, as built.

The primary reason for applying an asset rating, rather than operational rating (based on records of actual energy usage), approach to both new and existing buildings is the need for a consistent basis on which to compare the performance of two or more buildings being considered for purchase or rental, whether existing (occupied) or new / unoccupied properties. The pattern of energy use by a previous building user is not necessarily a reliable guide to the intrinsic energy performance of the building, or to energy use by the next building user.

In respect of the provisions of Article 7(3) for existing large public service buildings, however, the use of Operational Ratings has practical merit and is being considered, in consultation with the main public service estate management authorities. The requirement for these buildings is for continuous display of a BER, and is not related to a property transaction process. Among the advantages of operational rating for such buildings are the general availability of live or recent operational data, the comparatively low cost of such an approach, and the educational and motivational potential deriving from the visible evidence of actual performance.

Full consultation with interested parties will be required.

4.3.1.1 Residential Sector

In relation to the residential sector, the EPBD Working Group decided in early 2005 to proceed with the development of a national methodology, entitled Dwellings Energy Assessment Procedure (DEAP), which would meet the requirements of Article 3 and the Annex to the EPBD. In turn, this would serve the needs of building energy performance compliance for new dwellings (with respect to EPBD Articles 4 to 6) and production of BERs for both new and existing dwellings (EPBD Article 7). This decision took account of the existing Heat Energy Rating (HER) method within TGD L, a series of comparative studies previously commissioned by SEI, the experience of other EU Member States as observed through the EPBD Concerted Action project and other studies. While differing in some details, the underlying principles

and methods found in most countries show strong similarities. Notably, the methodologies for energy rating of dwellings are generally based on European Standards (IS: EN 832 and prEN 13790).

Given the tight timescale for implementation of the EPBD, the need for a tried and tested method, and North-South considerations on the island of Ireland, it was considered that a practical approach for the energy rating of dwellings could be to adopt a methodology based on the UK Standard Assessment Procedure (SAP) methodology. This has been the UK Government's recommended method for energy rating of dwellings since the early 1990s and has been revised to address the requirements of the EPBD. It includes both a core method originally developed for assessing new dwellings (mainly from drawings), and a variant (RD-SAP) for assessing existing dwellings (calculation from survey data).

On this basis, in June 2005 SEI commissioned an independent study to: (a) conduct a detailed critical review of SAP/ RD-SAP, including its algorithms and default data; (b) propose adapted procedures, and identify and incorporate amended data, appropriate to Irish conditions and practices; and (c) produce a working methodology, including prototype software, suitable for application as an official national methodology for dwellings in Ireland. In respect of new dwellings, this work is scheduled for completion in **June 2006**.

Prior to this methodology being applied, it will be necessary to conduct pilot tests to ensure the robustness of the procedure, and to commission development of a full software suite to enable successful market application, including associated training.

Accordingly, the earliest completion date for the first of the technical methodology variants (new dwellings) is provisionally shown in **Appendix II** as **mid 2006**.

In the case of apartment blocks, it is intended that energy performance compliance and BER assessment will be carried out at the level of the individual apartment unit, rather than the block as a whole.

4.3.1.2 Non-residential Sector

In relation to the non-residential sector, there is considerably greater diversity of building types, in form and function, both for new build and existing stock, than is the case with dwellings. Non-residential buildings vary in complexity from dwelling scale to large commercial developments, and can be subject to single or multiple occupancy. Moreover, while a variety of methods and software tools has been available to designers for many years, there is less widespread experience, nationally and internationally, in the application of relatively harmonised models for assessing energy performance than is the case with dwellings.

The establishment of a methodology for energy performance assessment and BER for non-residential buildings thus presents a more formidable challenge than for dwellings. The proposed timelines are accordingly longer.

At this point, it is intended to adopt an official national methodology for non-residential building, provisionally entitled Non-domestic Energy Assessment

Procedure (NEAP). However, this will not necessarily preclude the recognition of other methods which meet appropriate validation criteria.

It is also important to note the critical and pre-ordaining position of the technical methodologies, for both residential and non-residential buildings, within the sequence of tasks necessary for bringing BER to practical application in the property market. The subsequent tasks will include, in turn:

(i) software development in relation to calculation methods (Section 4.7);
(ii) consequent development and delivery of training programmes (Section 4.15);
(iii) establishment of integrated administration and management procedures including Quality Assurance (Sections 4.16 – 4.18); and
(iv) piloting and review (Section 4.19).

The critical position of the technical methodology is clear, given that, for each of these tasks, initiation and meaningful progression cannot take place until the preceding task is substantially complete. It is on the basis of this set of dependencies that the operative dates for market application set out in **Appendix II** are being proposed.

4.3.2 Inspection Methodologies

Standard national methods will also need to be developed for the inspection of air-conditioning systems and possibly boilers. The CEN standards address both of the above requirements and will be taken into consideration in this respect. Studies have been commissioned by SEI to review the current levels of inspection and reporting in Ireland with regard to boilers and air-conditioning systems and further details are provided in Sections 4.13 and 4.14 respectively.

Furthermore, to support effective market implementation of Articles 8 and 9 of the EPBD, it is proposed to commission the development of a boilers / heating systems inspection manual and an air-conditioning systems inspection manual. These manuals will set out the recommended scope, frequency and nature of inspections.

4.4 National Technical Data

Generally the proposed CEN standards provide only a generic framework for the calculation and inspection of energy performance. Therefore, it will be necessary, if applying these standards or other existing alternative standards, to incorporate technical data appropriate to national (and possibly regional) circumstances – for example, data particular to local climatic conditions and construction or other specification features. National technical data will thus be required in order to enable the completion of the national technical methodologies in Ireland, whether based on CEN standards or other methods. This will be required for residential buildings, non-residential buildings, air-conditioning systems and possibly boilers.

In this regard, one element of the independent study referenced in Section 4.3.1.1, to adopt a methodology based on the UK Standard Assessment Procedure (SAP) methodology for energy rating of Irish homes, has been to incorporate national technical data, appropriate to Irish conditions and practices.

4.5 Setting of Minimum Energy Performance Requirements

In considering implementation of the EPBD, particular regard has been given to the need to ensure methodological consistency between:

(1) the energy performance assessment or calculation procedures required to show compliance with Part L/ TGD L of the Building Regulations.

and

(2) the procedures required to produce a Building Energy Rating (BER) or certificate. The BER could for example be expressed on a scale A, B, C, D, E, etc. derived from the building energy performance under the Building Regulations and accompanied by recommendations on prioritised/cost effective options for improving the energy performance (Advisory Report).

For this reason, it is proposed that Part L / TGD L will be reviewed and amended, on a phased basis, as follows:

- Phase 1 (2005/2006): Higher energy performance / insulation standards for new non-residential buildings, revised energy performance assessment methodology for new residential buildings and energy performance standards for "major renovation" of large existing buildings (over 1,000m^2) (to be operative from **1 July 2006**). For dwellings, the performance target will be expressed as energy performance target expressed as kg CO_2 emissions/m^2/per annum;
- Phase 2 (2007/2008): Setting energy performance assessment methodology for new non-residential buildings (to be operative from **1 July 2008**).

In Phase 1, minimum energy performance standards for major renovations of large buildings (over 1000 m^2) are specified as follows:

(a) the existing definition of "material alteration" under the Building Regulations, 1997 is relied on to cover "major renovation" works for the purposes of Article 6 of the EPBD; and

(b) the energy performance requirements specified are applied to the building components or systems being renovated.

4.6 Feasibility Assessment of Alternative Energy Systems for Large New Buildings

Article 5 of the EPBD requires that for large new buildings of over 1000 m^2 (approx. 10,800 square feet) the technical, environmental and economic feasibility of alternative energy systems must be considered and taken into account before construction starts i.e. at the design stage. These alternative energy systems include decentralised energy supply based on renewable energy, combined heat and power (CHP), district or group heating or cooling and heat pumps.

Section 5 of the Building Control Bill 2005 transposes Article 5 of the EPBD and will come into operation on **1 January 2007**.

To facilitate design teams in meeting this requirement, SEI has commissioned a national study evaluating the feasibility of a wide range of alternative energy supply technology options for a variety of circumstances, including building scale, type and usage pattern, energy prices, and site and local environmental conditions. The study will result in a software tool which will be freely available to registered users and can be downloaded from the internet. The tool will be designed for application at both the early initial design stage and at the more detailed design stage. Use of the tool

will be evidence that the feasibility of alternative energy systems has been assessed for a development.

Design teams may choose either to apply the generic reference information and software tool produced from this national study, or to conduct their own building specific study.

4.7 Development of Calculation Software

Once national assessment methodologies (Section 4.3) have been established and adopted as "calculation engines" for both residential and non-residential buildings, software will be needed to assist energy assessors in carrying out the energy assessment of buildings and possibly generating BERs and accompanying Advisory Reports. A primary objective will be to ensure that all relevant software is "user friendly", and will simplify the calculation process for assessors.

Software must cater for:

- Calculations made "off plans" (new buildings) or using CAD systems or office computer technology;
- Calculations based on building surveys (existing buildings) using hand held computers compatible with a centralised computer database;
- Calculations based on a combination of data off plans (for example data for existing buildings designed using CAD) and building surveys; and
- Calculations based on measured energy use ("operational rating"), as this is a possible approach that could be adopted for energy rating of existing large public service buildings.

Such software will cover residential buildings, non-residential buildings and public service buildings.

In the case of each of the building categories covered, the following options have been considered regarding the manner in which the software will be produced:

- **Option 1:** Adopt, under licence, national calculation software already developed / tested in another EU Member State;
- **Option 2:** Commission the development of a national calculation software package that all assessors will be obliged to use;
- **Option 3:** Commission the development of a national calculation software package that assessors may use but also allow software packages developed by the private sector to be validated and approved for use;
- **Option 4:** Do not develop a national calculation software package but allow packages developed in the private sector to be validated and approved for use. Standard databases of default data, standard assumptions, standard calculation methodology and standard rating and advisory report format could be specified by the EPBD Implementation Group for use with all software packages developed.

These options are not mutually exclusive. For example, Option 1 could be expanded to include the right for competing private sector software packages to be developed / validated, as envisaged in Option 3. Investigation of these options formed part of a strategic assessment commissioned by SEI and which was completed in **April 2005**.

The approach to software provision for the various categories of buildings has been decided by the EPBD Working Group, as follows:

Residential Buildings

For residential buildings a national method (adapted from the existing UK Standard Assessment Procedure (SAP)) and a national software tool are being developed. The method will be known as the Dwellings Energy Assessment Procedure (DEAP). This reflects a combination of Options 1 and 2 above.

Non-residential Buildings (except existing large public service buildings)

There is a lack of established methods for energy rating of non-residential buildings and a high degree of complexity and variation in design, scale, function, usage, etc. Therefore, it is proposed that a dual approach, comprising the development of a national method and validation of other software packages, be adopted. Studies on existing methods and tools for energy rating of non-residential buildings will be required prior to making a final decision on this matter. The national method will be known as the Non-domestic Energy Assessment Procedure (NEAP). This reflects Option 3 above.

Existing Large Public Service Buildings

It is proposed that operational ratings will be used for the purposes of displaying energy ratings in existing large public service buildings (> 1000m^2) that are not being transacted. It is expected that projects being carried out under the EU "Intelligent Energy for Europe" programme will help to inform the software approach for this category of buildings (e.g. BUDI, EP Label, DISPLAY). In addition, national pilot studies on major categories of pubic service buildings in Ireland (e.g. schools, hospitals, etc.) are planned to enable finalisation of pragmatic and effective approaches.

4.8 Building Energy Rating (BER)

For **new buildings,** a provisional BER at the design stage is envisaged. This will be derived from calculated energy performance based on data derived from drawings and specifications, including CAD software suites. This will facilitate continued sale or letting of new buildings "off plans". This is recognised elsewhere in Europe as an acceptable, and necessary, approach in the case of new buildings. The final BER will take account of any changes to initial design assumptions in the finished buildings.

For **existing buildings,** the BER will be derived from calculated energy performance based on data obtained from available plans, specifications and a physical survey ("asset rating"). This is the only practical approach in the case of existing buildings because of wide variation in the age, type, construction and specification within the existing buildings stock, and the variable nature and validity of technical drawings and records for such buildings.

For existing large public service buildings (greater than 1000m^2) that are not being transacted, the rating is expected to be based on actual recorded energy consumption ("operational rating").

The format and content of the BER has yet to be decided. CEN has developed a draft standard prEN15217 defining the possible content and presentation of the building energy rating. This standard and formats being proposed in other Member States will be taken into consideration when developing the Irish BER system.

At this stage, the following features of BER are envisaged:

- **Format of BER**: Different formats will be used for (a) design / asset rating of residential buildings, (b) design / asset rating of non-residential buildings and (c) operational rating of existing large public service buildings. To enable clear comparative information for building owners and users, it is envisaged that the same formats will be used for both new and existing buildings within the same functional class.
- **Benchmarks**: BER may incorporate benchmark values e.g. based on TGD L to the Building Regulations.
- **Energy Performance Ratings**: A simplified rating scheme – for example; A to H – with accompanying quantitative indicator, probably expressed as kWh/m^2/year of delivered energy, will initially be used.
- **CO_2**: BER will also incorporate a CO_2 emissions indicator.

The format(s) of the BER will be drafted by the SEI for public / industry comment. Workshops will be co-ordinated and held by SEI during 2006 to review the proposed rating scheme (ref. **Appendix II** for proposed dates). The format of the rating will then be finalised by the EPBD Implementation Group.

The format(s) of the BER will be advertised in advance of the relevant operative date(s), in order to develop an awareness of the building energy rating in the market.

Having regard to the requirements to develop and validate the necessary technical procedures, software, training and administrative / management systems, it is envisaged that the requirement for BER will be introduced in phases as set out below.

It is proposed that the BER requirement will apply to:

- new residential buildings from **1 January 2007**;
- other new buildings (including non-residential buildings and public service buildings) from **1 July 2008**;
- existing buildings (including existing residential and non-residential buildings) when sold or let, from **1 January 2009**; and
- display of BER in existing large public service buildings from **1 January 2009.**

4.9 Advisory Report

The format and content of Advisory Reports will require careful consideration and design. The Advisory Report is a potential lever for stimulating investment in improvement measures, particularly in the existing building stock. It is proposed that SEI will commission the production of suitable Advisory Report templates, for both the residential and non-residential sectors (including existing large public service buildings).

At this stage it is envisaged that Advisory Reports will include the following:

- **Recommendations**: for capital investment to improve the energy performance of the building, to be ranked in priority, according to cost effectiveness and/or capital cost and ease of implementation.

- **Option**: for builder / owner / landlord to carry out immediate works and seek an updated rating.

- **Benefits**: estimated energy cost savings will be included.

It will be necessary to ensure that there is an efficient turnaround time on the issuing of all BER and Advisory Reports. Balanced with this, there is a need for all BER and Advisory Reports to be of a standard format and satisfy defined quality control standards. Procedures for ensuring this have yet to be determined.

The format(s) of the Advisory Report(s) will be drafted by SEI for consultation, following consultation on the content and format of the BER. Workshops, covering the residential and non-residential sectors, will be co-ordinated and held by SEI during the period **2006 to 2008** to review the proposed Advisory Report(s). The format(s) of the Advisory Report(s) will then be finalised by the EPBD Implementation Group.

4.10 Estimated Cost and Timescale – BER / Advisory Report

It will be important to ensure that the process of producing a BER, in conjunction with an Advisory Report, is intrinsic to the property transaction process and can be produced at a minimum achievable cost and in a minimum time period so as not to interfere with the selling or letting processes.

It is estimated that the cost of a BER for house transactions will not exceed €300 for a typical existing house.

The cost per unit may be lower, where the BER is produced for:

(a) New houses in a housing estate; or

(b) New apartments in an apartment block.

These costs will be monitored as the BER scheme evolves. A target turnaround time of less than 2 weeks is proposed for production of a BER for residential buildings, from the date of first communication by the vendor, leaser, or agent.

The cost and turnaround time for non-residential buildings will reflect the scale, complexity and age (e.g. availability of drawings) of the building and the assessment methodology applied.

The costs for new-build should be relatively marginal as the energy performance assessment will need to be completed for the purposes of demonstrating compliance with the Building Regulations and the information to carry out the rating will be available. For existing buildings the costs are expected to be more significant as energy rating will generally be based on a survey and furthermore the required information may not be easy to access. This is an area in which the expertise of other EU Member States and the EPBD Concerted Action project will be expected to be invaluable in pursuing cost-effective solutions.

4.11 Building Energy Rating for Existing Large Public Service Buildings

The requirement for prominent display of a Building Energy Rating (BER) in all existing large public service buildings (over 1000 m^2) applies even where the property is not being placed on the market. Successful implementation of this requirement will demand co-ordination with relevant public service bodies.

It is proposed that SEI should provide support for commissioning the necessary research, and for developing any separate information and analysis tools necessary to implement this provision. This will include ensuring, in conjunction with relevant public service bodies, the compilation and maintenance of a database of the energy performance of such buildings.

As mentioned in Section 4.7, it is likely that the BER for display in existing large public service buildings will be based on operational ratings i.e. measured energy use. As these buildings are not being transacted, the purpose of the rating will be to provide information regarding the energy use of the building by the current occupant and can also be used to show improvements over time. This represents a more cost effective and motivational approach to the energy rating of existing large public service buildings.

For new public service buildings it is proposed that the methodology for new non-residential buildings will be applied and the BER will be produced off the plans at the design stage. Operational ratings can subsequently be used for BER display once the building has been completed and occupied and energy use data has been collated over a sufficient period. Operational ratings would also be applicable to rented public buildings.

A standard BER (based on plans / survey), as for other non-residential buildings, will be required at point of sale or rent of a large public service building, should this arise.

As indicated in Section 4.9, it is proposed that this requirement will come into effect for all new public service buildings from **1 July 2008** and to applicable existing large public service buildings from **1 January 2009**.

4.12 Energy Efficiency of Boilers/Heating Systems

Under Article 8, Member States may either:

(a) **Option X:** Establish a system of regular inspection for boilers >20 kW fuelled by non-renewable fuel and a system of inspection for heating systems with boilers >20 kW and >15 years old;

OR

(b) **Option Y:** Provide advice to users on the replacement of boilers and modification of heating systems, where it can be shown to achieve a broadly equivalent overall impact to Option X.

Under a mandatory inspection regime (Option X), there would also have to be mandatory regular inspection of building heating systems with larger boilers (>20 kW), more than 15 years old, and inspections of systems with an effective rated output of more than 100 kW every 2 years (every 4 years in the case of gas fired boilers).

SEI commissioned a strategic study of the comparative merits and implications of these two options. The final draft of this study was received in **February 2006**.

This study profiled the distribution of boilers in Irish buildings by fuel, size / output and age, and assessed prevailing practice and potential in respect of inspection/servicing of boilers. It proceeded to explore the energy, cost and CO_2 impacts, both private and national, of differing scenarios within Options X and Y. In this regard, consideration was given to the logistical and other practical issues involved. Account was also taken of the findings and perspectives of work carried out on this issue in other EU Member States, as conveyed through the EPBD Concerted Action Project.

As a result of this assessment, it has been decided to adopt Option Y on the grounds of:

- *Focus*: The objective is to activate positive choices and actions by building (boiler/ heating system) owners. "Inspection", and associated information and advice, as specified by Article 8 will not in themselves save energy or abate CO_2. They must lead to positive decisions and actions in relation to maintenance servicing/adjustment or replacement of the boiler/heating system, to yield the energy savings. However, there is no obligation under Article 8 for building owners to implement any such actions.
- *Common requirements*: In considering the chain of events that is required to lead to energy and CO_2 savings, the substantive difference between Options X and Y lies in the initial trigger mechanism for action by the boiler/heating system owner, i.e. a mandatory or a voluntary regime. However, from the perspective of achieving the savings, common to both options is the need for:
  - Production of good quality information and advice in the form of action oriented messages to building owners;
  - Persistent targeted promotion of that information and advice at the points likely to have maximum influence;
  - Adequate numbers of available competent persons to deliver energy efficient maintenance and/ or replacement services for boilers/ heating systems;
  - Structured engagement and alignment with key professional and trade agents of influence and service delivery in the boilers/ heating systems sector.
- *Practicality and cost efficiency*: Under Option X, an extremely costly, and probably unworkable, enforcement system for mandatory inspections would be required to ensure compliance. Inspection would represent an unnecessary additional overhead cost for the large numbers of building owners already procuring a regular boiler maintenance service. It is expected that the voluntary promotional approach of Option Y, if properly targeted and structured, can be as effective as the mandatory inspection approach of Option X. With reference to the trigger mechanism and in terms of relevance and stimulus to action by building owners, it is considered that the information and advice under Option Y can be designed to a comparable quality to what would be established from inspections under Option X, at a lower cost burden.

The Option Y measures proposed are expected to include: establishment of a national appliance efficiency database; delivery of accredited training courses in energy efficiency installation and service maintenance practices; establishment of competent persons schemes for installers working to agreed codes of practice; development and delivery of a targeted nationwide campaign to stimulate building owners to commit to regular boiler servicing practices, and replacement of older or

less efficient boilers/ heating systems; and monitoring of the effectiveness of these measures.

The details of these measures to meet the requirements of the EPBD in relation to Article 8 will be drawn up by the Department of Communications, Marine and Natural Resources and SEI in consultation with interested parties and it is planned that these measures will be in place by **1 January 2008**.

4.13 Inspection of Air-Conditioning (A/C) Systems

Under Article 9, EU Member States are required to establish a system of regular inspection for air-conditioning systems with an effective rated output of more than 12 kW (non-residential systems generally).

A study was commissioned by SEI in **June 2005** to review the existing market profile, structures and activities in place in the area of air-conditioning systems commissioning, servicing and inspection in Ireland. The study also identified the nature of this work, who is carrying it out and what training / experience they generally have. This study, which was completed in **December 2005**, will inform the detailed design of the scheme to be introduced for the inspection of air-conditioning systems in Ireland.

The legislative measures to be taken in order to establish this inspection scheme have been prepared by the Department of Communications, Marine and Natural Resources in the form of draft Regulations under the European Communities Act,1972. These include reference to an Air-Conditioning System Manual which will set out the methodology and other requirements with which inspectors and assessors will be obliged to comply.

In respect of implementing this provision of the EPBD, it is planned to have the necessary measures in place by **1 January 2008**.

4.14 Training and Accreditation of Assessors and Inspectors

Once the relevant national methodologies have been agreed for assessing the energy performance of buildings and for inspection of air-conditioning systems, followed by development of supporting software, only then can the requisite training courses be developed, accredited and delivered. Training may be delivered in a number of formats which may include a combination of part-time, e-learning and distance learning options. It is expected that there will be much scope for learning from the EPBD Concerted Action Project (Section 3.6) in this area of implementation.

Building Energy Rating:

It is anticipated that BER assessors will be drawn from existing building professionals (e.g. Architects, Engineers, Surveyors, Building Services Technicians, etc.) undergoing specialised training rather than from the creation of a new profession solely dealing with building energy rating.

In the case of housing, based on the volume and composition of the market in Ireland, in theory it would appear that a nationwide network of around 1,000 active, full time equivalent, registered assessors would be required. In practice this could translate into a requirement for up to 2,000 trained and registered assessors. This is borne out by experience in other EU countries where part

time activity appears to be the norm. Some over-capacity will be necessary to ensure full geographical coverage, price competitiveness and satisfactory turnaround times.

A preliminary analysis of the number of BER assessors required for the residential sector is set out in **Appendix VI.**

The foundational training / experience required by candidates applying to attend BER assessor courses will be established for both the residential and non-residential buildings. The training courses are likely to include a competency test which candidates would be required to pass in order to become accredited assessors for the relevant building type, e.g. residential, non-residential, public buildings. Candidates will be required to register as certified assessors for the relevant building type(s) in order to be considered as independent experts and to submit BERs to the national database. An assessor will be permitted to produce a BER for any development upon registering as a certified assessor for that category of building and provided that the rating is carried out in an independent manner.

It is estimated that the duration of the assessors training course for residential buildings will be no more than 1 week (depending on the complexity of the methodology and the prior level of knowledge and experience of the trainees). This will not necessarily be in a single block period. The duration and prequalification requirements for non-residential BER training courses will be somewhat more onerous.

Air-Conditioning Systems:
The training with regard to the methodology developed for air-conditioning systems inspection and assessments is estimated at 2-3 days for practitioners with relevant experience. Again this will not necessarily be in a single block period.

Boilers/Heating Systems:
SEI is currently working with the main institutions and representative bodies in the heating trade to develop a training and registration system for qualified heating installers and maintenance technicians. Accompanied by promotional campaigning, this voluntary approach will be directed at improving standards in the marketplace in the direction of safer, more reliable and more energy efficient systems.

In relation to each of the above streams of training, it is proposed that the EPBD Implementation Group will establish a training specification detailing the minimum requirements for any proposed training courses for assessors/inspectors. It is anticipated that this specification will require the development of an Energy Assessor's Manual, training material, examinations, entry requirements, etc. The training specification will be developed by or on behalf of SEI, in consultation with HETAC, FETAC, FÁS or others. It is anticipated that training providers will develop courses to meet the requirements specification and that SEI or nominated body/bodies would accredit courses which fully meet the requirements. This approach will allow for the development of courses by various educational bodies, professional associations, private companies, etc. which can be tailored to meet the specific needs of their members/target market.

Training will be delivered by competent and registered trainers and which may include organisations representing the building professions, e.g. Association of Consulting Engineers of Ireland (ACEI), Engineers Ireland (EI), Royal Institute of the

Architects of Ireland (RIAI), Society of Chartered Surveyors (SCS), Chartered Institution of Building Services Engineers (CIBSE).

The phased implementation of training will be linked to the phased implementation of the BER scheme for residential and non-residential buildings and the air-conditioning systems inspection regime, to ensure that there is an appropriate interval between training and commencement of the rating work or inspection.

4.15 Quality Assurance (QA)

A scheme to provide quality assurance (QA) for the operative schemes will need to be developed by SEI. This will involve quality control of the calculation procedures, software validation, error detection, BER and Advisory Reports, air-conditioning systems inspection reports, training, auditing of assessors and inspectors and quality control of all associated administration systems.

Development of the QA system will be led by SEI and will be fully integrated with the scheme. In particular it will initially concentrate on the selection, training and auditing of assessors and inspectors, including the establishment of training activities and measures addressing the outputs from the assessors and inspectors such as random checking of surveys, calculations, BERs, Advisory Reports and inspection reports. It will necessitate the training and appointment of a relatively small number of auditors.

4.16 National Databases

A series of National Databases will need to be developed and maintained at the central administration point of the BER scheme, and possibly also for the air-conditioning inspection schemes. These databases may include:

- Registers of assessors for BERs;
- Registers of inspectors for air-conditioning systems;
- Records of BERs issued for new and existing buildings, for residential and non-residential sectors and for public service buildings;
- Records of Advisory Reports issued;
- Possible databases of energy efficiency improvement options, to provide supporting data libraries for the production of Advisory Reports;
- Records of air-conditioning systems inspections;
- Register or database of energy performance of existing large public service buildings (over 1000 m^2);
- Register of new building projects and major renovations over 1000 m^2.

A number of these will need to be appropriately configured with the potential for linkage to other (e.g. legal) databases in relation to the properties to which they apply.

4.17 Administration Committee / Secretariat

Infrastructure for managing and administrating the scheme will be required. This could involve:

(1) **Administration Committee** to oversee the development and strategic elements of the scheme with membership based on the EPBD Implementation Group.

(2) **Secretariat** to manage the day-to-day operation of the scheme. The feasibility of SEI providing secretariat services, with the assistance of contracting out arrangements, is under active consideration.

The responsibilities of the **Administration Committee** could include the following:

- Overseeing all aspects of the administration of the BER scheme, air-conditioning inspection scheme, and boiler / heating system efficiency actions and recommending any necessary changes in the light of experience.
- Advising Ministers on the initial setting and periodic revision of maximum fees for ratings, registration, training, etc. The fees set will cover all costs, including overheads of the BER scheme.
- Supervision of a mechanism for dealing with complaints.
- Overseeing development and maintenance of ICT systems for data collection, national databases, document generation and statistical analyses.
- Annual report on the implementation of the EPBD, including operation of the BER scheme.

The responsibilities of the **Secretariat** could include the following:

(1) Provide all support services necessary to enable the Administration Committee to carry out its work, and
(2) Advise on the contracting out of specialised work.

SEI commissioned a study to review the administration and ICT systems in operation or in preparation in some of the countries with established energy rating schemes, such as Denmark, The Netherlands, Austria and the UK. The study also evaluated options for the administration system and the National Database/s to be developed in Ireland. This work was completed in **July 2005**.

The EPBD Working Group has drawn up a proposed administration system, having regard to the results of the SEI study. An outline of the main elements of the proposed system is shown schematically in Figure 4.2. Steps will be taken to establish the required institutional arrangements for administration of the energy rating and inspection activities. It is envisaged that provision of the Secretariat function will be by competitive tendering process.

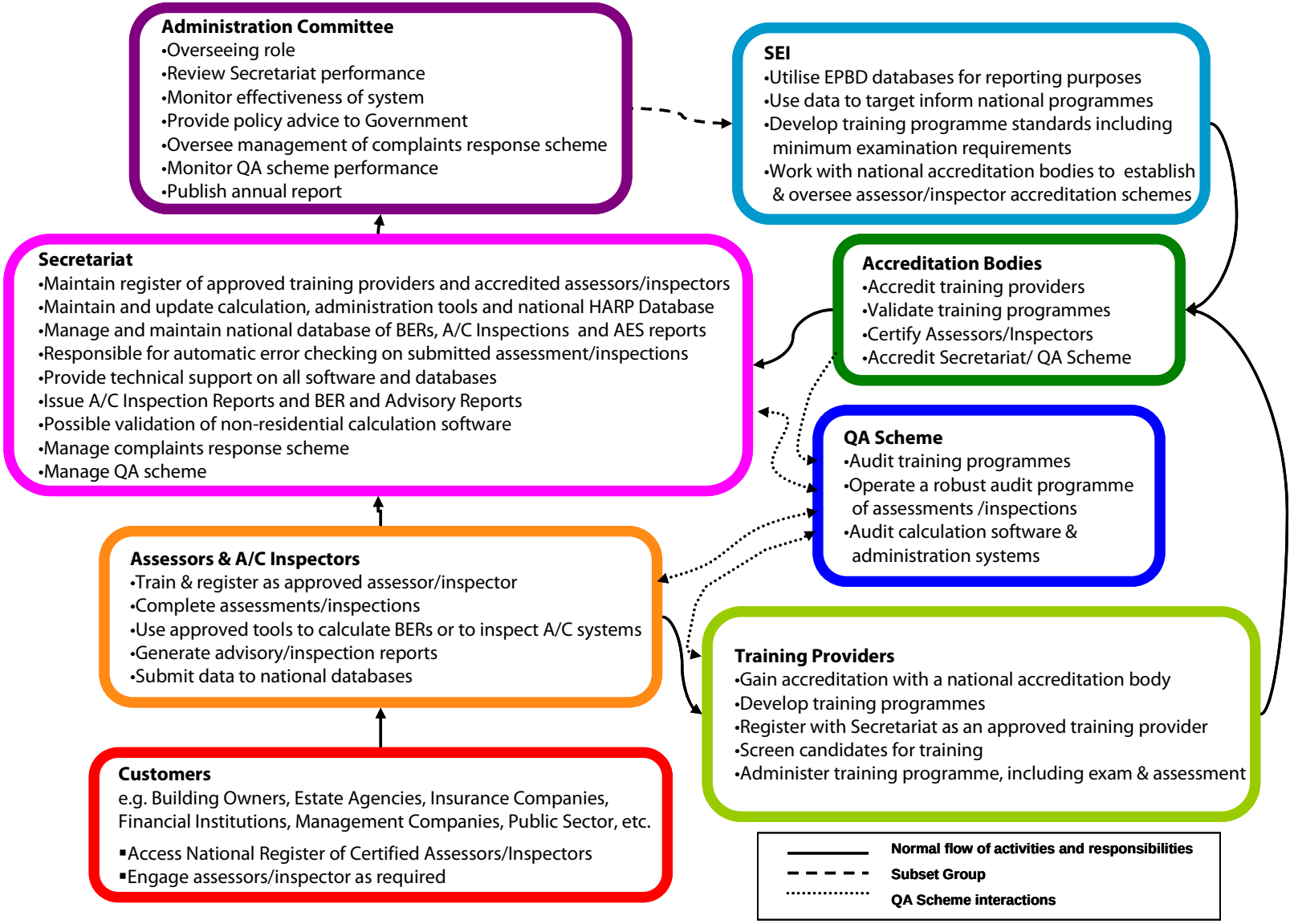

Figure 4.2 Proposed Structure of the EPBD Administration System

4.18 Piloting and Review of BER

Once developed, the calculation and survey methodologies and associated software for BER will be piloted by SEI in order to identify any issues, difficulties and adjustments that might be required. Once the draft national methodologies have been agreed to a sufficiently advanced stage, the software has been developed / validated and assessors have been trained, it is intended to commission pilot projects in respect of residential and non-residential buildings.

In the case of the residential sector, 150 dwellings around the country have already been assessed in a study commissioned by SEI in **2004/2005** to assess the energy performance of a sample of the Irish housing stock. This study used an adaptation of the Heat Energy Rating (HER) method set out in TGD L to the Building Regulations to calculate the energy performance of the homes. The pilot included a cross section of dwellings from the following categories:

- Apartments
- Semi-detached and detached homes
- Private and social housing
- Rural and urban housing.

Within the above categories, homes of various sizes and ages have also been piloted.

It is proposed that in due course 100 non-residential buildings will be rated in a BER pilot. These buildings will be drawn from around the country and will include representative buildings from the following categories :

- Offices
- Hotels & Restaurants
- Sports Facilities
- Wholesale and Retail Trade Services Buildings
- Education Buildings
- Hospitals
- Other Public Service Buildings

In addition, within the above categories, buildings of various sizes, ages and new build will be piloted.

Based on the findings from the piloting phase, the necessary adjustments will be made to the residential and non-residential energy performance calculation methodology, software, administration systems, etc., as required.

Section 5: Anticipated Impacts

5.1 Overview

Ireland's residential and non-residential building sectors accounted for respective annual energy expenditures of around €1.9 billion and €1.5 billion in 2004. Their contributions to CO_2 emissions were respectively 12 million tonnes and 8 million tonnes in that year, collectively representing 44% of Ireland's energy related CO_2 emissions. This is similar to the pattern in other EU Member States, which led to the EPBD being adopted in part as a response to the Kyoto Protocol.

In view of the complex and far reaching nature of the requirements of the EPBD, brief comment on the nature of its possible impacts is appropriate.

The principal impacts anticipated from implementation of the EPBD in general are:

- Creation of widespread market visibility and awareness of the energy performance of buildings;
- Expected stimulation of demand, by consumers, developers (private, public or social) and specifiers, for more energy efficient and renewable energy products and services in buildings – both new and existing;
- The introduction of energy performance as an additional dimension of complexity within the building design, specification, procurement and marketing processes;
- Possible increased impetus to innovation by building designers, developers, and other product and service providers;
- Associated upskilling of service providers within the industry;
- Consequential demand for enhanced foundational and supplementary education and training providers;
- Potential impact on property pricing, depending on other market conditions;
- Provision of a formal obligation for periodic review of certain regulatory requirements.

Cumulatively, the outcome of the emerging market transformation process represented by these impacts is expected to be a contribution, in conjunction with other policy measures, to the progressive abatement in energy related CO_2 emissions from Ireland's buildings relative to previous practice.

5.2 Building Energy Performance Standards

The impact of progressive improvements in energy performance of newbuild construction and material alterations since the introduction of thermal insulation standards in the late 1970s, and the establishment of Building Regulations in 1992, has been considerable. It is estimated by SEI that the nominal space heating demand of an Irish home built to the standards of the Building Regulations, 2002, is 76% less than that of an equivalent home built in the 1970s. This will have yielded tangible energy and CO_2 savings, although much of the benefit may have been taken up by households in the form of higher internal temperatures, which research had indicated to be unsatisfactorily low during the 1970s. Against such a background of

rising comfort conditions, one indicator of the energy saving effect is that the recorded average annual fuel demand per housing unit across the housing stock as a whole has fallen by 9% between 1990 and 2004.

In respect of non-residential buildings, it is estimated that the more stringent standards to be introduced through the amended Building Regulations Part L from July 2006 will lead to significant annual savings on energy use and CO_2 emissions. The expression of amended Building Regulations Part L in the form of overall energy performance requirements rather than component specifications should also assist the judgements of design teams in relation to developing optimum energy solutions.

The requirement under the EPBD for a review of building energy performance standards every 5 years will provide a formal mechanism for ensuring that the standards embodied in regulations are maintained at the highest practicable level of ambition on the basis of cost effectiveness, energy / environmental policy and industry capacity. While a principle of diminishing returns applies to the additional energy and CO_2 saving benefits of new standards over and above those introduced over the past two decades in particular.

5.3 Building Energy Rating (BER)

A key motive behind the introduction of BER, with the accompanying Advisory Report, is to stimulate property owners and developers to invest in upgrading the energy performance of their buildings. This would typically cover some combination of: insulation of the building fabric, improved glazing, ventilation control, boilers and heating systems and, in the case of non-residential buildings, lighting systems. EU and Irish studies have suggested a substantial technical and economic potential for energy and CO_2 through energy efficiency measures in the built environment.

The effectiveness of BER and other elements of the EPBD in realising this potential will depend on the extent to which they actually influence beneficial change in owner and consumer decisions and behaviour. This is across a market in which over 150,000 residential property transactions take place each year. It must be borne in mind that as prescribed in the Directive itself, the direct deliverables to the market will mainly be in the form of information or advice to enable owner or consumer choice. It will be the follow through actions by the owner or consumer, in using that information or advice, which will yield the end result of improved energy performance. For this reason, the quality and user friendliness of that advice, and possible accompanying measures, will be expected to have an important bearing on that end result.

At this stage, it is difficult to anticipate and quantify the precise impacts of the BER. Only experience, following the introduction of the BER and the accompanying Advisory Report, will provide data that will allow firm conclusions to be drawn.

The following are preliminary expectations which are subject to change in the light of future developments in Ireland and experience of other Member States. Also, any sustained energy crisis - involving a shortage of energy and/or escalation in price of energy - could significantly increase the impact of the BER.

(A) Impact on marketability of buildings offered for letting or sale

Caution should be exercised regarding the impact of the EPBD on market behaviour and choice, at least in the short term. There has been a low take up

of the voluntary Heat Energy Rating (HER) scheme introduced in the national Building Regulations in 1997, operative from 1 July 1998.

Given the current high demand for houses, the BER may have a limited impact on the marketability of houses for letting or sale. Moreover, the differentiation in BER scores between different new houses in general is unlikely to be very wide. Over time, awareness and understanding can be expected to grow but perhaps not to the extent that the energy rating of the building itself will supersede key choice factors such as location.

The BER may have more impact on the marketability of commercial buildings. Financial institutions (which reportedly own a high proportion of commercial buildings in Ireland) may be concerned about the potentially adverse impact of a relatively poor energy rating on the marketing of property to public sector clients seeking environmentally sustainable buildings, or to energy cost conscious business users.

(B) Impact on upgrading the energy performance of existing buildings

Upgrades can range from minor and relatively inexpensive works (e.g. installation of lagging insulation on central heating boilers or of insulation in attics) to major and relatively expensive works (e.g. installation of new glazing, lined wall insulation or commercial lighting systems). There may be a time lag between the issuing of the BER and the carrying out of any energy upgrading works, because of financial constraints affecting building owners.

In Ireland, Advisory Reports accompanying BERs (Article 7) are more likely to recommend extensive works to upgrade the energy performance of the building in the case of older commercial buildings, and the estimated 1 million dwellings built before the coming into operation of thermal performance/insulation standards under the national Building Regulations on 1 June 1992 and/or with less efficient heating systems, except where such homes have already been appropriately upgraded by home improvement works.

BERs may create economic pressure for either the substantial upgrading of the energy performance of older commercial buildings or their demolition and replacement by modern buildings, depending on the residual useful life / value of the buildings.

5.4 Boiler Efficiency Measures

As set out in Section 4.13, the potential impacts of a boiler inspection regime were evaluated and it is considered that the boiler advice option (Option Y) under Article 8, if properly structured, can be as effective as boiler inspections. It is proposed that the EPBD Implementation Group will focus on the design of an effective information campaign aimed at encouraging regular inspection of residential and commercial boilers and replacement of inefficient boilers or heating installations.

This approach is set within a goal of accelerating market change in favour of more energy efficient products and practices relating to boilers/ heating systems in Irish buildings. The focus is on establishing a well structured set of initiatives, led by government bodies, but with a partnership approach aligning with the business interests of energy efficiency product and service providers, especially key influencers, in the boilers/ heating systems sector.

This set of initiatives will be expected to activate sustainable energy decisions and consequential material action by building owners (mainly householders) in relation to regular boiler servicing, and the replacement and upgrading of older or less efficient boilers/ heating systems. This impact, yielding energy cost and CO_2 savings, will necessarily be graduated over a period of several years.

5.5 Air-conditioning Systems Inspections

As set out in Section 4.14, Article 9 of the EPBD requires Member States to establish an inspection regime for large air-conditioning systems with an effective rated output of greater than 12kW. The study commissioned by SEI found that the frequency of servicing of air-conditioning systems varies and depends on what kind of system is in place. For split systems if a service contact exists, two visits per annum would be normal. Where no service contact is in place, the service is generally on a breakdown basis and would typically be 18 months between call-outs. For chillers, which are usually associated with large ventilation systems in office blocks and shopping centres, there is usually a formal service contract in place for the overall system involving two visits per year. In order to minimise cost and maximise effectiveness in implementing this article of the Directive, it is planned to build on the existing inspection regime as far as practicable.

The legislative measures proposed will be implemented in conjunction with aligned business interests in the air conditioning sector, and will be aimed at ensuring a regular regime of service maintenance of air-conditioning systems, prioritised according to system size. This impact, yielding energy cost and CO_2 savings, will again be graduated over a period of several years.

5.6 Alternative Energy Systems (AES)

As detailed in Section 4.6, SEI has commissioned the development of a software tool to assist design teams in assessing the feasibility of alternative energy systems (AES) in large new buildings over 1,000m^2. It is expected that this resource will not only be a useful information tool for design teams but will also be useful in informing planners within the Local Authorities and building owners of the opportunities for the integration of AES in new developments.

5.7 Energy Efficient Products and Services

There will be a demand for trained and certified assessors and inspectors to produce the BERs and to carry out air-conditioning system inspections.

There will also be a requirement for accredited trainers to provide the necessary training for these individuals, both at foundational level and as part of continuing professional development.

There will be new demands for energy efficient products identified in the Advisory Reports and also in association with major renovations where minimum energy performance criteria will need to be met. This may also be subject to an increased impetus to innovation by building designers, developers, and other product and service providers.

Section 6: Consultation, Promotion and Information Campaign

6.1 Consultation

Consultation with interested parties will be carried out throughout the development, piloting and implementation phases.

The aim of the consultation process will be to secure the co-operation and participation of key actors and influencers in the property sector, including the following parties:

- Representative bodies in the construction industry – Construction Industry Federation, Irish Building Materials Federation, Irish Concrete Federation, Irish Home Builders Association, Irish Property Management Association, Irish Timber Frame Manufacturers Association, Master Builders and Contractors Association, Institute of Building Control, etc.;

- Representative bodies among building professionals - Irish Auctioneers and Valuers Institute, Institute of Professional Auctioneers and Valuers, Royal Institute of the Architects of Ireland, Chartered Institute of Architectural Technologists, Engineers Ireland, Association of Consulting Engineers of Ireland, Mechanical Engineering & Building Services Contractors Association, Chartered Institution of Building Services Engineers, Society of Chartered Surveyors, Construction Surveyors Institute, Chartered Institute of Building, City & County Managers Association, the Incorporated Law Society, Sustainable Buildings Network (SEBNet), etc.;

- Energy specialists – including Local Energy Agencies and the Association of Energy Professionals in Ireland;

- Standards, certification and accreditation bodies – including Irish National Accreditation Board, NSAI, FÁS, FETAC and HETAC;

- Educational, Training and Research bodies – including University Schools of Architecture and Building Services, Dublin Institute of Technology (covering the full spectrum of building trades), and regional Institutes of Technology;

- Energy services utilities and representative bodies – including Bord Gais Eireann (BGE) and the Oil Fired Technical Association (OFTEC), Irish CHP Association, Irish LPG Association, Irish Solar Energy Association and other renewable energy representatives;

- Energy user groups – Office of the Director of Consumer Affairs (ODCA), Consumer Association of Ireland, Association of Chambers of Commerce in Ireland, Office of Public Works (OPW), Irish Business & Employers Confederation (IBEC), Irish Hotels Federation, Retail Grocery, Dairy & Allied Trades' Association, Irish Vintners Federation, etc.;

- Financial Institutions / property owners – including banks, building societies, social housing associations, pension funds (major stakeholders in tertiary sector buildings), Local Authorities, Government Departments, Office of Public Works (OPW), Irish Property Owners Association (IPOA) and Irish Property & Facility Managers Association (IPFMA).

6.2 Proposed Workshops

A series of workshops / road shows will be held on a regional basis to inform interested parties on the progress regarding the implementation of the EPBD and to obtain feedback to inform future decisions. An indicative list is given in **Appendix II.**

6.3 Promotion and Information Campaign

A comprehensive promotional and information campaign will be required in order to raise awareness of EPBD requirements among groups such as:

- General public
- Representatives of Consumers - Office of the Director of Consumer Affairs (ODCA) and Consumer Association of Ireland (CAI)
- Construction and property sector professionals and trade interests
- Training centres and educational institutes
- Those interested in working as assessors
- Software developers
- Hardware suppliers.

In 2005 SEI organised or participated in a total of 46 information sharing events on various aspects of the EPBD implementation, with a combined total attendance of over 2,200 people. These events included three public Draft Action Plan Consultation Events which were held in Dublin, Cork and Galway in May and June of 2005 and which over 300 people attended. It is proposed that these events will continue as implementation progresses. In the first five weeks of 2006, for example, such presentations have been made to 1,200 people. Numerous contributions to press articles and radio and television programmes were also made during 2005.

Additional concepts for a promotion and information campaign will be developed by SEI in consultation with agencies to build public awareness and understanding of EPBD requirements and specifically BER. It is anticipated that the campaign will include design/print, advertising, PR and indirect marketing initiatives particularly with key market players. The campaign will be launched in advance of the introduction of BER in Ireland and will continue throughout the pilot and implementation phases.

In addition to this general awareness campaign a targeted information campaign on boiler efficiency advice will be devised and activated to fulfil requirements under Article 8 (Option Y).

6.4 National EPBD Website

In order to provide live access to the full community of interests in relation to news, reference material, discussion / consultation documents and other information, a dedicated national EPBD website (www.sei.ie/epbd) was established in **April 2005**. This site is updated as developments progress.

APPENDIX I

EU Directive 2002/91/EC of 16 December 2002 on the Energy Performance of Buildings (EPBD)

DIRECTIVE 2002/91/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 16 December 2002

on the energy performance of buildings

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 175(1) thereof,

Having regard to the proposal from the Commission [1],

Having regard to the opinion of the Economic and Social Committee [2],

Having regard to the opinion of the Committee of the Regions [3],

Acting in accordance with the procedure laid down in Article 251 of the Treaty [4],

Whereas:

(1) Article 6 of the Treaty requires environmental protection requirements to be integrated into the definition and implementation of Community policies and actions.

(2) The natural resources, to the prudent and rational utilisation of which Article 174 of the Treaty refers, include oil products, natural gas and solid fuels, which are essential sources of energy but also the leading sources of carbon dioxide emissions.

(3) Increased energy efficiency constitutes an important part of the package of policies and measures needed to comply with the Kyoto Protocol and should appear in any policy package to meet further commitments.

(4) Demand management of energy is an important tool enabling the Community to influence the global energy market and hence the security of energy supply in the medium and long term.

(5) In its conclusions of 30 May 2000 and of 5 December 2000, the Council endorsed the Commission's action plan on energy efficiency and requested specific measures in the building sector.

(6) The residential and tertiary sector, the major part of which is buildings, accounts for more than 40 % of final energy consumption in the Community and is expanding, a trend which is bound to increase its energy consumption and hence also its carbon dioxide emissions.

(7) Council Directive 93/76/EEC of 13 September 1993 to limit carbon dioxide emissions by improving energy efficiency (SAVE) [5], which requires Member States to develop, implement and report on programmes in the field of energy efficiency in the building sector, is now starting to show some important benefits. However, a complementary legal instrument is needed to lay down more concrete actions with a view to achieving the great unrealised potential for energy savings and reducing the large differences between Member States' results in this sector.

(8) Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of the Member States relating to construction products [6] requires construction works and their heating, cooling and ventilation installations to be designed and built in such a way that the amount of energy required in use will be low, having regard to the climatic conditions of the location and the occupants.

(9) The measures further to improve the energy performance of buildings should take into account climatic and local conditions as well as indoor climate environment and cost-effectiveness. They should not contravene other essential requirements concerning buildings such as accessibility, prudence and the intended use of the building.

(10) The energy performance of buildings should be calculated on the basis of a methodology, which may be differentiated at regional level, that includes, in addition to thermal insulation other factors that play an increasingly important role such as heating and air-conditioning installations, application of renewable energy sources and design of the building. A common approach to this process, carried out by qualified and/or accredited experts, whose independence is to be guaranteed on the basis of objective criteria, will contribute to a level playing field as regards efforts made in Member States to energy saving in the buildings sector and will introduce transparency for prospective owners or users with regard to the energy performance in the Community property market.

(11) The Commission intends further to develop standards such as EN 832 and prEN 13790, also including consideration of air-conditioning systems and lighting.

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[1] OJ C 213 E, 31.7.2001, p. 266 and OJ C 203 E, 27.8.2002, p. 69.
[2] OJ C 36, 8.2.2002, p. 20.
[3] OJ C 107, 3.5.2002, p. 76.
[4] Opinion of the European Parliament of 6 February 2002 (not yet published in the Official Journal), Council Common Position of 7 June 2002 (OJ C 197, 20.8.2002, p. 6) and decision of the European Parliament of 10 October 2002 (not yet published in the Official Journal).
[5] OJ L 237, 22.9.1993, p. 28.
[6] OJ L 40, 11.2.1989, p. 12. Directive as amended by Directive 93/68/EEC (OJ L 220, 30.8.1993, p.1).

(12) Buildings will have an impact on long-term energy consumption and new buildings should therefore meet minimum energy performance requirements tailored to the local climate. Best practice should in this respect be geared to the optimum use of factors relevant to enhancing energy performance. As the application of alternative energy supply systems is generally not explored to its full potential, the technical, environmental and economic feasibility of alternative energy supply systems should be considered; this can be carried out once, by the Member State, through a study which produces a list of energy conservation measures, for average local market conditions, meeting cost-effectiveness criteria. Before construction starts, specific studies may be requested if the measure, or measures, are deemed feasible.

(13) Major renovations of existing buildings above a certain size should be regarded as an opportunity to take cost-effective measures to enhance energy performance. Major renovations are cases such as those where the total cost of the renovation related to the building shell and/or energy installations such as heating, hot water supply, air-conditioning, ventilation and lighting is higher than 25 % of the value of the building, excluding the value of the land upon which the building is situated, or those where more than 25 % of the building shell undergoes renovation.

(14) However, the improvement of the overall energy performance of an existing building does not necessarily mean a total renovation of the building but could be confined to those parts that are most relevant for the energy performance of the building and are cost-effective.

(15) Renovation requirements for existing buildings should not be incompatible with the intended function, quality or character of the building. It should be possible to recover additional costs involved in such renovation within a reasonable period of time in relation to the expected technical lifetime of the investment by accrued energy savings.

(16) The certification process may be supported by programmes to facilitate equal access to improved energy performance; based upon agreements between organisations of stakeholders and a body appointed by the Member States; carried out by energy service companies which agree to commit themselves to undertake the identified investments. The schemes adopted should be supervised and followed up by Member States, which should also facilitate the use of incentive systems. To the extent possible, the certificate should describe the actual energy-performance situation of the building and may be revised accordingly. Public authority buildings and buildings frequently visited by the public should set an example by taking environmental and energy considerations into account and therefore should be subject to energy certification on a regular basis. The dissemination to the public of this information on energy performance should be enhanced by clearly displaying these energy certificates. Moreover, the displaying of officially recommended indoor temperatures, together with the actual measured temperature, should discourage the misuse of heating, air-conditioning and ventilation systems. This should contribute to avoiding unnecessary use of energy and to safeguarding comfortable indoor climatic conditions (thermal comfort) in relation to the outside temperature.

(17) Member States may also employ other means/measures, not provided for in this Directive, to encourage enhanced energy performance. Member States should encourage good energy management, taking into account the intensity of use of buildings.

(18) Recent years have seen a rise in the number of air-conditioning systems in southern European countries. This creates considerable problems at peak load times, increasing the cost of electricity and disrupting the energy balance in those countries. Priority should be given to strategies which enhance the thermal performance of buildings during the summer period. To this end there should be further development of passive cooling techniques, primarily those that improve indoor climatic conditions and the microclimate around buildings.

(19) Regular maintenance of boilers and of air-conditioning systems by qualified personnel contributes to maintaining their correct adjustment in accordance with the product specification and in that way will ensure optimal performance from an environmental, safety and energy point of view. An independent assessment of the total heating installation is appropriate whenever replacement could be considered on the basis of cost-effectiveness.

(20) The billing, to occupants of buildings, of the costs of heating, air-conditioning and hot water, calculated in proportion to actual consumption, could contribute towards energy saving in the residential sector. Occupants should be enabled to regulate their own consumption of heat and hot water, in so far as such measures are cost effective.

(21) In accordance with the principles of subsidiarity and proportionality as set out in Article 5 of the Treaty, general principles providing for a system of energy performance requirements and its objectives should be established at Community level, but the detailed implementation should be left to Member States, thus allowing each Member State to choose the regime which corresponds best to its particular situation. This Directive confines itself to the minimum required in order to achieve those objectives and does not go beyond what is necessary for that purpose.

(22) Provision should be made for the possibility of rapidly adapting the methodology of calculation and of Member States regularly reviewing minimum requirements in the field of energy performance of buildings with regard to technical progress, *inter alia*, as concerns the insulation properties (or quality) of the construction material, and to future developments in standardisation.

(23) The measures necessary for the implementation of this Directive should be adopted in accordance with Council Decision 1999/468/EC of 28 June 1999 laying down the procedures for the exercise of implementing powers conferred on the Commission [1],

HAVE ADOPTED THIS DIRECTIVE:

Article 1

Objective

The objective of this Directive is to promote the improvement of the energy performance of buildings within the Community, taking into account outdoor climatic and local conditions, as well as indoor climate requirements and cost-effectiveness.

This Directive lays down requirements as regards:

(a) the general framework for a methodology of calculation of the integrated energy performance of buildings;

(b) the application of minimum requirements on the energy performance of new buildings;

(c) the application of minimum requirements on the energy performance of large existing buildings that are subject to major renovation;

(d) energy certification of buildings; and

(e) regular inspection of boilers and of air-conditioning systems in buildings and in addition an assessment of the heating installation in which the boilers are more than 15 years old.

Article 2

Definitions

For the purpose of this Directive, the following definitions shall apply:

1. 'building': a roofed construction having walls, for which energy is used to condition the indoor climate; a building may refer to the building as a whole or parts thereof that have been designed or altered to be used separately;

2. 'energy performance of a building': the amount of energy actually consumed or estimated to meet the different needs associated with a standardised use of the building, which may include, *inter alia*, heating, hot water heating, cooling, ventilation and lighting. This amount shall be reflected in one or more numeric indicators which have been calculated, taking into account insulation, technical and installation characteristics, design and positioning in relation to climatic aspects, solar exposure and influence of neighbouring structures, own-energy generation and other factors, including indoor climate, that influence the energy demand;

3. 'energy performance certificate of a building': a certificate recognised by the Member State or a legal person designated by it, which includes the energy performance of a building calculated according to a methodology based on the general framework set out in the Annex;

4. 'CHP' (combined heat and power): the simultaneous conversion of primary fuels into mechanical or electrical and thermal energy, meeting certain quality criteria of energy efficiency;

5. 'air-conditioning system': a combination of all components required to provide a form of air treatment in which temperature is controlled or can be lowered, possibly in combination with the control of ventilation, humidity and air cleanliness;

6. 'boiler': the combined boiler body and burner-unit designed to transmit to water the heat released from combustion;

7. 'effective rated output (expressed in kW)': the maximum calorific output specified and guaranteed by the manufacturer as being deliverable during continuous operation while complying with the useful efficiency indicated by the manufacturer;

8. 'heat pump': a device or installation that extracts heat at low temperature from air, water or earth and supplies the heat to the building.

Article 3

Adoption of a methodology

Member States shall apply a methodology, at national or regional level, of calculation of the energy performance of buildings on the basis of the general framework set out in the Annex. Parts 1 and 2 of this framework shall be adapted to technical progress in accordance with the procedure referred to in Article 14(2), taking into account standards or norms applied in Member State legislation.

This methodology shall be set at national or regional level.

The energy performance of a building shall be expressed in a transparent manner and may include a CO_2 emission indicator.

Article 4

Setting of energy performance requirements

1. Member States shall take the necessary measures to ensure that minimum energy performance requirements for buildings are set, based on the methodology referred to in Article 3. When setting requirements, Member States may differentiate between new and existing buildings and different categories of buildings. These requirements shall take account of general indoor climate conditions, in order to avoid possible negative effects such as inadequate ventilation, as well as local conditions and the designated function and the age of the building. These requirements shall be reviewed at regular intervals which should not be longer than five years and, if necessary, updated in order to reflect technical progress in the building sector.

[1] OJ L 184, 17.7.1999, p. 23.

2. The energy performance requirements shall be applied in accordance with Articles 5 and 6.

3. Member States may decide not to set or apply the requirements referred to in paragraph 1 for the following categories of buildings:

— buildings and monuments officially protected as part of a designated environment or because of their special architectural or historic merit, where compliance with the requirements would unacceptably alter their character or appearance,

— buildings used as places of worship and for religious activities,

— temporary buildings with a planned time of use of two years or less, industrial sites, workshops and non-residential agricultural buildings with low energy demand and non-residential agricultural buildings which are in use by a sector covered by a national sectoral agreement on energy performance,

— residential buildings which are intended to be used less than four months of the year,

— stand-alone buildings with a total useful floor area of less than 50 m².

Article 5

New buildings

Member States shall take the necessary measures to ensure that new buildings meet the minimum energy performance requirements referred to in Article 4.

For new buildings with a total useful floor area over 1 000 m², Member States shall ensure that the technical, environmental and economic feasibility of alternative systems such as:

— decentralised energy supply systems based on renewable energy,

— CHP,

— district or block heating or cooling, if available,

— heat pumps, under certain conditions,

is considered and is taken into account before construction starts.

Article 6

Existing buildings

Member States shall take the necessary measures to ensure that when buildings with a total useful floor area over 1 000 m² undergo major renovation, their energy performance is upgraded in order to meet minimum requirements in so far as this is technically, functionally and economically feasible. Member States shall derive these minimum energy performance requirements on the basis of the energy performance requirements set for buildings in accordance with Article 4. The requirements may be set either for the renovated building as a whole or for the renovated systems or components when these are part of a renovation to be carried out within a limited time period, with the abovementioned objective of improving the overall energy performance of the building.

Article 7

Energy performance certificate

1. Member States shall ensure that, when buildings are constructed, sold or rented out, an energy performance certificate is made available to the owner or by the owner to the prospective buyer or tenant, as the case might be. The validity of the certificate shall not exceed 10 years.

Certification for apartments or units designed for separate use in blocks may be based:

— on a common certification of the whole building for blocks with a common heating system, or

— on the assessment of another representative apartment in the same block.

Member States may exclude the categories referred to in Article 4(3) from the application of this paragraph.

2. The energy performance certificate for buildings shall include reference values such as current legal standards and benchmarks in order to make it possible for consumers to compare and assess the energy performance of the building. The certificate shall be accompanied by recommendations for the cost-effective improvement of the energy performance.

The objective of the certificates shall be limited to the provision of information and any effects of these certificates in terms of legal proceedings or otherwise shall be decided in accordance with national rules.

3. Member States shall take measures to ensure that for buildings with a total useful floor area over 1 000 m² occupied by public authorities and by institutions providing public services to a large number of persons and therefore frequently visited by these persons an energy certificate, not older than 10 years, is placed in a prominent place clearly visible to the public.

The range of recommended and current indoor temperatures and, when appropriate, other relevant climatic factors may also be clearly displayed.

Article 8

Inspection of boilers

With regard to reducing energy consumption and limiting carbon dioxide emissions, Member States shall either:

(a) lay down the necessary measures to establish a regular inspection of boilers fired by non-renewable liquid or solid fuel of an effective rated output of 20 kW to 100 kW. Such inspection may also be applied to boilers using other fuels.

Boilers of an effective rated output of more than 100 kW shall be inspected at least every two years. For gas boilers, this period may be extended to four years.

For heating installations with boilers of an effective rated output of more than 20 kW which are older than 15 years, Member States shall lay down the necessary measures to establish a one-off inspection of the whole heating installation. On the basis of this inspection, which shall include an assessment of the boiler efficiency and the boiler sizing compared to the heating requirements of the building, the experts shall provide advice to the users on the replacement of the boilers, other modifications to the heating system and on alternative solutions; or

(b) take steps to ensure the provision of advice to the users on the replacement of boilers, other modifications to the heating system and on alternative solutions which may include inspections to assess the efficiency and appropriate size of the boiler. The overall impact of this approach should be broadly equivalent to that arising from the provisions set out in (a). Member States that choose this option shall submit a report on the equivalence of their approach to the Commission every two years.

Article 9

Inspection of air-conditioning systems

With regard to reducing energy consumption and limiting carbon dioxide emissions, Member States shall lay down the necessary measures to establish a regular inspection of air-conditioning systems of an effective rated output of more than 12 kW.

This inspection shall include an assessment of the air-conditioning efficiency and the sizing compared to the cooling requirements of the building. Appropriate advice shall be provided to the users on possible improvement or replacement of the air-conditioning system and on alternative solutions.

Article 10

Independent experts

Member States shall ensure that the certification of buildings, the drafting of the accompanying recommendations and the inspection of boilers and air-conditioning systems are carried out in an independent manner by qualified and/or accredited experts, whether operating as sole traders or employed by public or private enterprise bodies.

Article 11

Review

The Commission, assisted by the Committee established by Article 14, shall evaluate this Directive in the light of experience gained during its application, and, if necessary, make proposals with respect to, *inter alia*:

(a) possible complementary measures referring to the renovations in buildings with a total useful floor area less than 1 000 m^2;

(b) general incentives for further energy efficiency measures in buildings.

Article 12

Information

Member States may take the necessary measures to inform the users of buildings as to the different methods and practices that serve to enhance energy performance. Upon Member States' request, the Commission shall assist Member States in staging the information campaigns concerned, which may be dealt with in Community programmes.

Article 13

Adaptation of the framework

Points 1 and 2 of the Annex shall be reviewed at regular intervals, which shall not be shorter than two years.

Any amendments necessary in order to adapt points 1 and 2 of the Annex to technical progress shall be adopted in accordance with the procedure referred to in Article 14(2).

Article 14

Committee

1. The Commission shall be assisted by a Committee.

2. Where reference is made to this paragraph, Articles 5 and 7 of Decision 1999/468/EC shall apply, having regard to the provisions of Article 8 thereof.

The period laid down in Article 5(6) of Decision 1999/468/EC shall be set at three months.

3. The Committee shall adopt its Rules of Procedure.

Article 15

Transposition

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive at the latest on 4 January 2006. They shall forthwith inform the Commission thereof.

When Member States adopt these measures, they shall contain a reference to this Directive or shall be accompanied by such reference on the occasion of their official publication. Member States shall determine how such reference is to be made.

2. Member States may, because of lack of qualified and/or accredited experts, have an additional period of three years to apply fully the provisions of Articles 7, 8 and 9. When making use of this option, Member States shall notify the Commission, providing the appropriate justification together with a time schedule with respect to the further implementation of this Directive.

Article 16

Entry into force

This Directive shall enter into force on the day of its publication in the *Official Journal of the European Communities*.

Article 17

Addressees

This Directive is addressed to the Member States.

Done at Brussels, 16 December 2002.

For the European Parliament	*For the Council*
The President	*The President*
P. COX	M. FISCHER BOEL

ANNEX

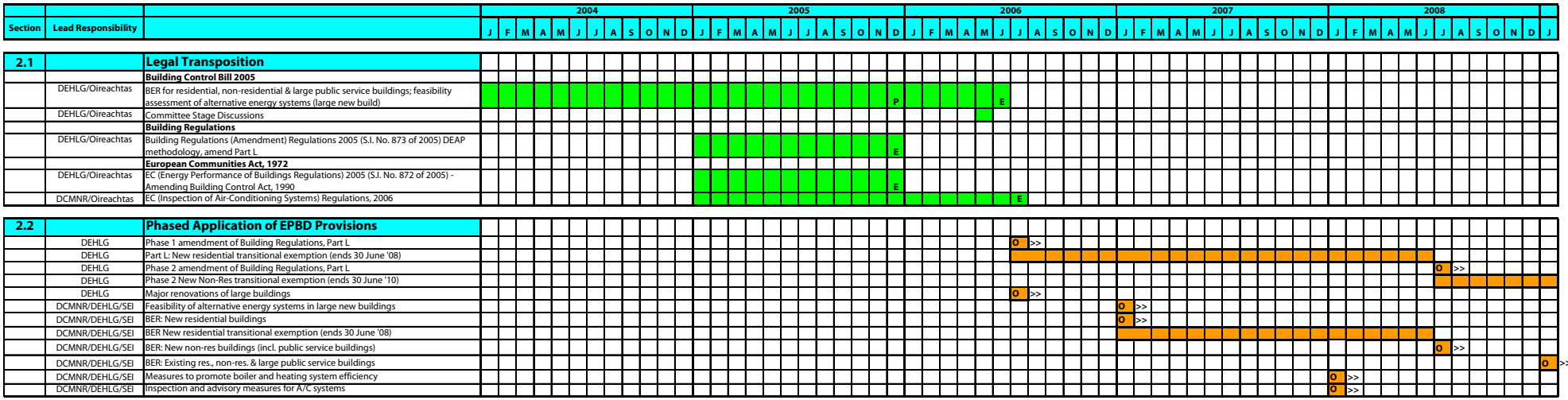
General framework for the calculation of energy performance of buildings (Article 3)

1. The methodology of calculation of energy performances of buildings shall include at least the following aspects:
   (a) thermal characteristics of the building (shell and internal partitions, etc.). These characteristics may also include air-tightness;
   (b) heating installation and hot water supply, including their insulation characteristics;
   (c) air-conditioning installation;
   (d) ventilation;
   (e) built-in lighting installation (mainly the non-residential sector);
   (f) position and orientation of buildings, including outdoor climate;
   (g) passive solar systems and solar protection;
   (h) natural ventilation;
   (i) indoor climatic conditions, including the designed indoor climate.
2. The positive influence of the following aspects shall, where relevant in this calculation, be taken into account:
   (a) active solar systems and other heating and electricity systems based on renewable energy sources;
   (b) electricity produced by CHP;
   (c) district or block heating and cooling systems;
   (d) natural lighting.
3. For the purpose of this calculation buildings should be adequately classified into categories such as:
   (a) single-family houses of different types;
   (b) apartment blocks;
   (c) offices;
   (d) education buildings;
   (e) hospitals;
   (f) hotels and restaurants;
   (g) sports facilities;
   (h) wholesale and retail trade services buildings;
   (i) other types of energy-consuming buildings.

APPENDIX II

Proposed Timetable to Implement the EPBD in Ireland 2004 - 2009

SECTION 2. LEGAL TRANSPOSITION & ACCOMPANYING MEASURES



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SECTION 4. TECHNICAL SYSTEMS DEVELOPMENT MEASURES (CONTINUED)

RESIDENTIAL BUILDINGS

Section	Lead Responsibility		2004 J F M A M J J A S O N D	2005 J F M A M J J A S O N D	2006 J F M A M J J A S O N D	2007 J F M A M J J A S O N D	2008 J F M A M J J A S O N D J
New Residential Buildings (Res) : Part L Compliance							
		Operative Date: New Res - Part L			O >>		
		Transitional Exemption new res - Part L (ends 30 June '08)					
4.3		**Adoption of National Methodologies (Res)**					
	DEHLG/SEI	Development of methodology & prototype software - new res (DEAP)		PT CS	R		
	DEHLG/SEI	Consultative workshops on methodology - new res (DEAP)			C C		
	DCMNR/DEHLG/SEI	Publish National Methodology - new res Part L (DEAP paper version)			P		
	DEHLG/SEI	Finalise DEAP software (basic version) for Part L Compliance			P		
4.15		**Training for Part L Compliance (Res)**					
	DEHLG/SEI	Specify training for DEAP software (basic version) for new dwellings					
	Training bodies	Deliver training - DEAP software (basic version)					
Residential Buildings (Res) : BER							
		Operative Date: New Res BER				O >>	
		Transitional Exemption new res (ends 30 June '08)					
		Operative Date: Existing Res BER					O >>
4.3		**Adoption of National BER Methodologies (Res)**					
	DEHLG/SEI	Development of BER method - new res, incorporating DEAP		PT CS	R		
	DCMNR/DEHLG/SEI	Development of BER method - existing res, incorporating DEAP				Sp CS R	
	DCMNR/DEHLG/SEI	Consultative workshops on BER method - existing res					
4.7 / 4.8		**Development of BER Software (Res)**					
	SEI	Study on strategic options	PT CS	R			
	EPBD Working Group	Decision on software - residential					
	SEI	Development of BER software specification documents - new res		PT	CS R		
	SEI	Development of BER software suite - new res			PT CS P		
	SEI	Development of BER software specification documents - existing res					
	SEI	Development of BER software suite - existing res					P
4.9		**BER - Label Format (Res)**					
	SEI	BER label format - new res			DD C P		
	SEI	BER label format - existing res				DD C D P	
4.10		**BER - Advisory Report Format (Res)**					
	SEI	Advisory Report - new res			DD C P		
	SEI	Advisory Report - existing res				Sp CS DD C P	
4.15		**Training & Accreditation of BER Assessors (Res)**					
	SEI	Investigation of detailed options					
	DCMNR/DEHLG/SEI	Decision on provision of training and prequalifications			D		
	SEI	Specify training - BER new res, incorporating DEAP					
	SEI/ Accr. bodies	Accredit training courses - BER new res, incorporating DEAP					
	Training bodies	Deliver training courses - BER new res, incorporating DEAP					
	SEI	Specify training - BER existing res, incorporating DEAP					
	SEI/ Accr. bodies	Accredit training courses - BER existing res, incorporating DEAP					
	Training bodies	Deliver training courses - BER existing res, incorporating DEAP					
4.19		**Piloting and Review of BER (Res)**					
	SEI	Preliminary pilot	Sp CS	R			
	SEI	Pilot & Review - Existing res					

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SECTION 4. TECHNICAL SYSTEMS DEVELOPMENT MEASURES (CONTINUED)

NON-RESIDENTIAL BUILDINGS

Section	Lead Responsibility		2004												2005												2006												2007												2008												
			J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J
New Non-Residential Buildings (Non-res) : Part L Compliance																																																															
	DEHLG	**Operative Date for New Non-res - Part L**																																																							O	>>					
		New Non-Res - Transitional Exemption (ends 30 June '10)																																																													
4.3		**Adoption of National Methodologies (Non-res)**																																																													
	DEHLG/SEI	Review of existing methodologies - new non-res																																																													
	DEHLG/SEI	Consultative workshops on methodology - new non-res																																																													
	DCMNR/DEHLG/SEI	Decision on methodology - non-res Part L compliance																																																													
	DEHLG/SEI	Development/validation of methodology - new non-res Part L Compliance																																																													
4.15		**Training for Part L Compliance (Non-res)**																																																													
	DEHLG/SEI	Specify training																																																													
	Training Bodies	Delivery of training																																																													

Section	Lead Responsibility		2004												2005												2006												2007												2008												
			J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J
Non-Residential Buildings (Non-res) : BER																																																															
		Operative Date for New Non-res - BER																																																							O	>>					
		New Non-Res - Transitional Exemption (ends 30 June '10)																																																													
		Operative Date for Existing Non-res - BER																																																													O >>
4.3		**Adoption of National BER Methodologies (Non-res)**																																																													
	DEHLG/SEI	Development/validation of BER methodology - new non-res (see above)																																																													
	DEHLG/SEI	Development/validation of BER methodology - existing non-res																																																													
	DEHLG/SEI	Consultative workshops on BER methodology - existing non-res																																																													
4.4		**National Technical Data (Non-res)**																																																													
	SEI	Compile national technical data - non-res																																																													
4.7/ 4.8		**Development of BER Software (Non-res)**																																																													
	SEI	Study on strategic options - existing non-res							Sp		CS							R																																													
	DCMNR/DEHLG/SEI	Decision on software - existing non-res																																																												
	DCMNR/DEHLG/SEI	Development/validation of BER software - existing non-res																																																													
4.9		**BER - Label Format (Non-res)**																																																													
	SEI	BER label format - new non-res																																									DD	C		P																	
	SEI	BER label format - existing non-res																																																				DD	C		P						
4.10		**BER - Advisory Report (Non-res)**																																																													
	SEI	Advisory Report Format - new non-res																																									DD	C		P																	
	SEI	Advisory Report Format - existing non-res																																																				DD	C		P						
4.15		**Training & Accreditation of BER Assessors (Non-res)**																																																													
	SEI	Investigation of detailed options																																																													
	DCMNR/DEHLG/SEI	Decision on provision of training and prequalifications																																																													
	SEI	Specify training - BER new non-res.																																																													
	SEI/Accr. Bodies	Accredit training courses - BER new non-res																																																													
	Training Bodies	Deliver Training - new non-res																																																													
	SEI	Specify training - BER existing non-res.																																																													
	SEI/Accr. Bodies	Accredit training courses - BER existing non-res																																																													
	Training Bodies	Deliver Training - existing non-res.																																																													
4.19		**Piloting and Review of BER (Non-res)**																																																														
	SEI	Full pilot & review - new non-res																																																													
	SEI	Full pilot & review - existing non-res																																																													

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SECTION 4. TECHNICAL SYSTEMS DEVELOPMENT MEASURES (CONTINUED)

OTHER TECHNICAL DEVELOPMENT MEASURES

Section	Lead Responsibility		2004 J	F	M	A	M	J	J	A	S	O	N	D	2005 J	F	M	A	M	J	J	A	S	O	N	D	2006 J	F	M	A	M	J	J	A	S	O	N	D	2007 J	F	M	A	M	J	J	A	S	O	N	D	2008 J	F	M	A	M	J	J	A	S	O	N	D	J
4.6		**Feasibility Assessment of Alternative Energy Systems (AES) for Large New Buildings**																																																																	
		Operative Date: Feasibility Assessment																																																																
	SEI	Generic national study & development of software tool																	Sp		CS			R	C										P																																
	SEI	Training on software tool																																																																	
	SEI	Updated generic national study																																																																	
4.12		**BER: Existing Large Public Service Buildings**																																																																	
		Operative Date: New Public Service Buildings																																																																
		New Non-Res - Transitional Exemption (ends 30 June '10)																																																															
		Operative Date : Existing Large Public Service Bldgs																																																															
	SEI	Additional research on methodology, procedures, databases																																																																
	Public service orgns	Pilot BER for existing large public service buildings																																																															
	SEI	Develop/validate methodology for existing large public service buildings																																																														
	SEI	Develop/validate software for existing large public service buildings																																																														
	SEI/Accr. Bodies	Accredit training courses - BER public buildings																																																													
	Training Bodies	Deliver Training - BER public buildings																																																												
4.13		**Energy Efficiency of Boilers/ Heating Systems**																																																															
		Operative Date: Boilers / Heating Systems																																																															
	SEI	Study on strategic options						Sp		CS																		R																																				
	DCMNR	Decision on boiler inspection Vs. information																				D																																									
	DCMNR/SEI	Steps to implement information/ inspection scheme																																																														
4.14		**Inspection of Air-Conditioning Systems (A/C)**																																																															
		Operative Date: Inspection of A/C Systems																																																														
	SEI	Study on strategic options																		Sp		CS			R																																									
	EPBD Working Group	Decision on inspection of A/C																							D																																							
	DCMNR/SEI	Develop A/C inspection programme																																																														
	DCMNR/SEI	Specify training for A/C inspections																																																													
	SEI/Accr. Bodies	Accredit training courses for A/C inspections																																																												
	Training Bodies	Deliver training courses for A/C inspections																																																											
4.16		**Quality Assurance**																																																														
	SEI/Secretariat	Develop Quality Assurance scheme/s																																																												
	SEI	Oversee implementation of QA scheme/s																																																												
4.17		**National Databases**																																																													
	SEI	Establish links with existing databases																																																												
	SEI	Develop Register/s of assessors, inspectors and auditors																																																												
	SEI	Database/s supporting Advisory Reports																																																											
	SEI/Secretariat	Develop database for BER /Inspections																																																										
	SEI/Secretariat	Maintain national databases																																																										
4.18		**Administration Committee / Secretariat**																																																												
	SEI	Strategic study						Sp		CS								R																																											
	DCMNR/DEHLG/SEI	Decision on administration structure																					D																																						
	SEI	Establishment/Running of Secretariat																																																									
	SEI	Establishment/Running of Administrative Committee																																																									

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SECTION 6. CONSULTATION, PROMOTION & INFORMATION CAMPAIGN

Section	Lead Responsibility		2004 J	F	M	A	M	J	J	A	S	O	N	D	2005 J	F	M	A	M	J	J	A	S	O	N	D	2006 J	F	M	A	M	J	J	A	S	O	N	D	2007 J	F	M	A	M	J	J	A	S	O	N	D	2008 J	F	M	A	M	J	J	A	S	O	N	D	J
6.1		**Consultation**																																																																				
	SEI/DCMNR/DEHLG	Preparation of Draft Action Plan by EPBD Working Group																																																																				
	DCMNR/DEHLG	Approval of Draft Action Plan by Ministers																P																																																		
	DCMNR/DEHLG/SEI	Public consultation on Draft Action Plan																	C	C	C																																															
	DCMNR/DEHLG/SEI	Review of Draft Action Plan																																																																			
	DCMNR/DEHLG/SEI	Publication of revised Action Plan																																																																		
	DCMNR/DEHLG/SEI	Review of Action Plan																																																																			
	DCMNR/DEHLG/SEI	Implementation of Action Plan & ongoing review																																																																	
6.2		**Proposed Workshops**																																																																			
	SEI/DEHLG	Briefings to construction & property sector, & media/ public																																																																		
	SEI	Public Sector workshops (re. Draft Action Plan)																																																																	
	SEI	Workshops for Residential Sector (re. Draft Action Plan)																																																																
	SEI	Workshops for Non-Residential (re. Draft Action Plan)																																																															
	DEHLG/SEI	Consultative workshops on methodology - new res (DEAP)																																																														
	SEI	BER Label - New res																																																														
	SEI	Advisory Report new res																																																													
	SEI	BER Label - Existing res																																																												
	SEI	Advisory Report existing res																																																											
	SEI	BER Label - New non-res																																																											
	SEI	Advisory Report new non-res																																																										
	SEI	BER Label - existing non-res																																																										
	SEI	Advisory Report existing non-res																																																									
	SEI	Workshops on energy efficiency of boilers/heating systems																																																									
	SEI	Workshops on Air Conditioning System inspections																																																									
6.3		**Promotion and Information Campaign**																																																																		
	SEI	Develop concepts with communications agencies																																																																	
	SEI	Development of campaign & materials																																																																	
	SEI	Carry out campaign																																																																	
6.4		**National EPBD Website**																																																																	
	DCMNR	Reserve domain name www.epbd.ie																																																																	
	SEI	Establish and maintain website																																																															

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APPENDIX III

List of Written Submissions Received on the

Draft Action Plan for Implementation of the EU Energy Performance of Buildings Directive in Ireland (April 2005)

List of Written Submissions Received on the Draft Action Plan for Implementation of the EPBD in Ireland (April 2005)

The following organisations and individuals made written submissions on the Draft EPBD Action Plan during the public consultation period April –July 2005:

- Association of Consulting Engineers Ireland (ACEI)
- Aerobord
- Association of Irish Energy Agencies (AIEA)
- Association of Building Engineers (ABE)
- Bord na Mona
- Century Homes
- Chimney Development Association (CDA)
- Republic of Ireland Centre of the Chartered Institute of Architectural Technologists (CIAT)
- Chartered Institution of Building Services Engineers (CIBSE) (x2)
- Chartered Institute of Building (CIOB)
- Conan Lynch & Co. Consulting Engineers
- CRH Europe Insulation
- Cylon Controls
- Delap & Waller
- Delap & Waller EcoCo (x 2)
- Department Of Education and Science
- EcoCo
- Eirdata
- Endever
- Energy Research Group (ERG), UCD
- Eurisol
- Fewer Harrington Lawlor & Partners
- Robert M. Foley & Associates, Architects
- Galway Energy Agency Ltd.
- Health Service Executive (HSE), North West
- Irish Building Control Institute Council (IBCI)
- Irish Concrete Federation (ICF)
- Irish Hardware and Building Materials Association (IHBMA)
- Irish Home Builders Association IIHBA, CIF

- Joseph Little Architects
- Kingspan Insulation
- Law Society of Ireland
- Mayo Eco Builders
- Michael Cassidy Architect (MCA)
- Meath Energy Management Agency Ltd.
- Moy Isover Ltd.
- National Installer Federation
- NGP Services
- Nicer Ltd.
- Office of the Director of Consumer Affairs (ODCA)
- OFTEC
- Office of Public Works (OPW)
- Mr. John Lynch
- Mr. Denis O'Keeffe, Civil Engineering Technician
- Mr. Mark O'Reilly, Engineer
- Overy & Associates
- F.E. Perri & Associates
- John Dolan, Engineer
- Project Management Group
- Renewable Energy Skillnet
- Royal Institute of the Architects of Ireland, Sustainability Taskforce
- Roof Manufacturers and Suppliers Association
- RPS Group
- SDA O'Flynn Architects
- Sustainable Energy in Buildings Network (SEBNET)
- SiBS
- SL Controls
- SNC, Building Services Consulting Engineers
- Society of Chartered Surveyors
- The Bar Council
- Udaras na Gaeltachta
- Waterford IT
- Will Woodrow, Wildlife consultant
- www.energyrating.net

APPENDIX IV

List of National EPBD Related Studies Commissioned by Sustainable Energy Ireland (SEI)

List of National EPBD Related Studies Commissioned by Sustainable Energy Ireland (SEI)

The following is a list of national EPBD related studies commissioned by SEI:

Completed Studies:

- Review of existing Home Energy Rating Schemes

- Review of administration software options for implementing the Energy Performance of Buildings Directive (EPBD) in Ireland
  - Lot 1 – Review of International Best Practice
  - Lot 2 – Review of existing data on Irish households
  - Lot 3 – Review of existing certification schemes in Ireland

- Review of calculation and survey software options for Implementing the Energy Performance of Buildings Directive (EPBD) in Ireland

- Study on meeting the requirements of the Energy Performance of Buildings Directive (EPBD) with regard to air-conditioning systems

Copies of the above studies can be downloaded from www.sei.ie/epbd under the "key documents" section.

- Study on the UK Standard Assessment Procedure (SAP) with regard to meeting the requirements of the EU Energy Performance of Buildings Directive (EPBD) for dwellings in Ireland

- Production of a Requirements Specification for the Development of a Software Tool for Calculating the Energy Performance of New Dwellings in Ireland

Ongoing Studies:

- National Study on Alternative Energy Systems to meet the requirements of the Energy Performance of Buildings Directive (EPBD)

- Database of Irish Domestic boilers to support implementation of the Energy Performance Buildings Directive in Ireland

APPENDIX V

List of Draft Technical Standards being Prepared by CEN to Support Implementation of the EPBD

Draft Technical Standards in Preparation by CEN to Support Implementation of the EPBD

Higher level and Integrating Standards				
Titles	**Draft Standard**	**Proposed Standard (prEN)**	**Published Standard (EN)**	**EN under Review**
Section 1 : Standards concerned with calculation of overall energy use in buildings				
Energy performance of buildings - Methods for expressing energy performance and for energy certification of buildings	**X**	**prEN 15217**		
Energy performance of buildings – Overall energy use, primary energy and CO_2 emissions	**X**	**prEN 15315**		
Energy performance of buildings-Assessment of energy use and definitions of ratings	**X**	**prEN 15203**		
Heating systems in buildings-Data requirements for standard economic evaluation procedures related to energy systems in buildings, including renewable sources	**X**	**prEN 15459**		
Section 2 : Standards concerned with calculation of delivered energy				
	X			
Heating systems in buildings – Method for calculation of system energy requirements and system efficiencies (*multiple parts*)	**x**	**prEN 15316**		
Ventilation for buildings-Calculation of room temperatures and of load and energy for buildings with room conditioning systems	**X**	**prEN 15243**		
Design of embedded water based surface heating and cooling systems *(to facilitate renewable low temperature heating and high temperature cooling)(multiple parts)*	**X**	**prEN 15377**		
Ventilation in Buildings – Calculation methods for energy requirements due to ventilation and infiltration in commercial buildings	**X**	**prEN 15241**		
Calculation methods for energy efficiency improvements by the application of integrated building automation products and systems	**X**	**prEN 15232**		
Energy performance of buildings – Energy requirements for lighting- part 1: Lighting energy estimation	**X**	**prEN 15193-1**		

Section 3 : Standards concerned with calculation of <u>net energy for heating and cooling</u>				
Thermal performance of buildings – Calculation of energy use for space heating		**prEN ISO 13790**		
Energy performance of buildings – Calculation of energy use for space heating and cooling – Simplified method	**X**	**prEN ISO 13786**		**Revision of EN ISO13790:2004**
Thermal performance of buildings – Sensible room cooling load calculation – General criteria and validation procedures	**X**	**prEN 15255**		
Thermal performance of buildings – Calculation of energy use for space heating and cooling – General criteria and validation procedures	**X**	**prEN 15265**		

Other Supporting Standards

Titles	Draft Standards	Proposed Standard (prEN)	Published Standard (EN)	EN under Review
Section 4 : Standards to support the above				
4A : Thermal performance of building components				
Thermal performance of buildings – Transmission and ventilation heat transfer coefficients – Calculation method	**X**	**prEN ISO 13789**		**EN ISO 13789**
Thermal performance of building components – Dynamic thermal characteristics – Calculation methods	**X**	**prEN ISO13786**		**EN ISO 13786**
Building components and building elements – Thermal resistance and thermal transmittance – Calculation method	**X**	**prEN ISO 6946**		**EN ISO 6946**
Thermal performance of buildings – Heat transfer via the ground – Calculation methods	**X**	**prEN ISO 13370**		**EN ISO 13370**
Thermal performance of curtain walling – Calculation of thermal transmittance – Simplified method	**x**	**prEN 13947**		
Thermal performance of windows, doors and shutters – Calculation of thermal transmittance – Parts 1 and 2	**x**	**prEN ISO 10077**		**EN ISO 10077-1,2**
Thermal bridges in building construction –Heat flows and surface temperatures	**X**	**prEN ISO 10211**		**EN ISO 10211 – 1,2**
Thermal bridges in building construction – Linear thermal transmittance – Simplified methods and default values	**X**	**prEN ISO 14683**		**EN ISO 14683**
Building materials and products – Hygrothermal properties-Tabulated design values and procedures for determining declared and design thermal values thermal values	**X**	**prEN 10456**		**EN ISO 10456**
4B : Ventilation and air infiltration				
Ventilation for buildings – Calculation methods for the determination of air flow rates in dwellings including infiltration			**I.S. EN 13465**	
Ventilation for buildings – Calculation methods for the determination of air flow rates in buildings including infiltration	**Covers all buildings ,will eventually supersede EN 13465**	**prEN 15242**		

Other Supporting Standards

Titles	Draft Standards	Proposed Standard (prEN)	Published Standard (EN)	EN under Review
Ventilation for non residential buildings – Performance requirements for ventilation and room conditioning systems		**prEN 13779**		**EN 13779**
4C : Overheating and solar protection				
Thermal performance of buildings – Calculation of internal temperatures of a room in summer without mechanical cooling – General criteria and validation procedures			**I.S. EN ISO 13791**	
Thermal performance of buildings – Calculation of internal temperatures of a room in summer without mechanical cooling – Simplified methods			**EN ISO 13792**	
Solar protection devices combined with glazing – Calculation of solar and light transmittance – Simplified methods			**I.S. EN 13363-1**	
Solar protection devices combined with glazing – Calculation of solar and light transmittance – Detailed calculation methods			**I.S. EN 13363-2**	
4D : Indoor conditions and external climate				
Design criteria and the indoor environment			**CR 1752**	
Criteria for the indoor environment, including thermal, indoor air quality(ventilation),light and noise	**X**	**prEN 15251**		
Hygrothermal performance of buildings – Calculation and presentation of climatic data Part 1: Monthly and annual means of single metrological elements			**I.S.EN ISO 15927 –1**	
Hygrothermal performance of buildings – Calculation and presentation of climatic data Part 2, 3, 4, 5, 6)	**x**	**prEN ISO 15927 – 2, 3, 6**	**I.S. EN 15927 –4, I.S. EN 15927-5**	
4E : Definitions and terminology				
Thermal insulation – Physical quantities and definitions			**I.S.EN ISO 7345**	
Thermal insulation – Heat transfer by radiation – Physical quantities and definitions			**I.S.EN ISO 9288**	
Thermal insulation – Heat transfer conditions and properties of materials – Vocabulary			**I.S.EN ISO 9251**	
Ventilation for buildings – Symbols, terminology and graphical symbols			**I.S.EN 12792**	
Section 5 : Standards concerned with monitoring and verification of energy performance				

Ventilation in buildings-Test procedures and measuring methods for handing over installed ventilation and air conditioning systems			**I.S. EN 12599**	
Thermal performance of buildings-Determination of air permeability of buildings-Fan pressurization method			**I.S. EN 13829**	
Thermal performance of buildings- Determination of air change in buildings-Tracer gas dilution method			**I.S. EN ISO 12569**	
Thermal performance of buildings - Qualitative detection of thermal irregularities in building envelopes-infrared method			**I.S. EN 13187**	
Heating systems in buildings-Inspection of boilers and heating systems	**x**	**prEN 15378**		
Ventilation for buildings-Energy performance of buildings-Guidelines for the inspection of ventilation systems	**x**	**prEN 15239**		
Ventilation for buildings-Energy performance of buildings-Guidelines for the inspection of air conditioning systems	**x**	**prEN 15240**		

APPENDIX VI

Preliminary Analysis of the Number of Assessors Required for Building Energy Rating (BER) of the Residential Sector

Preliminary Analysis of the Number of Assessors Required for Building Energy Rating (BER) of the Residential Sector

1.0 Number of Building Energy Ratings (BERs) Required

(i) Construction of 70,000 new dwellings (assuming 30,000 grouped private, 8,000 grouped social and 32,000 individual houses). "Grouped" includes apartments.

(ii) An annual volume of letting / re-letting of around 40,000 private rented dwellings.

(iii) An annual volume of letting / re-letting of around 10,000 social (Local Authority or Housing Association) rented dwellings.

(iii) Re-sale of 5% of stock of approximately 1 million owner occupied dwellings - 50,000 per annum.

The total number of ratings required annually is thus estimated at **170,000**.

2.0 Number of Assessors Required

(i) The requirement for assessors estimated below relates to numbers of individual assessors, as distinct from numbers of professional practices.

(ii) It is assumed that for the majority of registered assessors the provision of BERs will be a part time activity integrated with or supplementary to their core professional services – probably as architects, engineers or surveyors. It is however possible that some qualified assessors will practice exclusively as BER providers.

(iii) Some over-capacity of registered assessors relative to market demand is important in the interests of ensuring full geographical coverage, competitiveness on price and satisfactory turnaround times. Experience in some other EU countries suggests that a proportion of trained and duly qualified assessors may carry out – or choose to carry out - BERs on an infrequent basis.

(iv) For new housing, delivery of a BER and Advisory Report is expected to be primarily an adjunct to the design and specification service required to show compliance with the Building Regulations Part L.

a. Here it is estimated that a full time practitioner (architect) servicing private or social housing developers could deliver assessments covering up to 600 units per year, but in practice, allowing for other commitments, might cover an average of 200 units per year. On this basis, a total of 38,000 grouped houses would require *190* assessors.

b. In relation to individual new housing units, many in rural locations with dispersed geographical coverage, the number of units assessed per average practitioner is assumed to be 100 per year (i.e. no more than 25% of professional time is applied to BER activity). On this basis, a total of 32,000 individual houses would require *320* assessors.

(v) In respect of sale or rental of existing housing, almost all of which will apply on an individual unit basis (which is also assumed for the case of apartments), delivery of a BER and Advisory Report is expected to be primarily an adjunct to the property survey process, possibly in the context of producing a Vendor Information Pack (Section 2.3). This will necessitate a property inspection as well as the calculation and reporting processes.

a. Here it is estimated that a full time practitioner (surveyor) servicing sales or rentals might in practice cover an average of 200 units per year. On this basis, an annual total of 50,000 sales and 50,000 rentals would require 500 assessors.
b. In relation to existing housing in Denmark it has been reported that the most active assessors complete 300 – 400 assessments per year. As a tentative indication, based on enquiries by building professionals to SEI to date, perhaps up to 200 persons might choose to practice as full time assessors, carrying out say 350 assessments per year, and thus covering 70,000 units.
c. In contrast, it is possible that up to 100 technical professional staff of local authorities and other social housing providers may become registered as assessors. In respect of such assessors, the number of units transacted per assessor may be 100 or less.
d. On balance, therefore, an initial minimum of 500 assessors for this segment of the market seems plausible.

(vi) On the basis of the above assumptions, it would appear that a minimum of around *1,000* active assessors would be required to service Ireland's housing market needs at current levels of construction, sales and rental activity.

(vii) Two factors may serve to reduce the demand on assessor numbers over time:
a. Given that a BER may have a validity of up to ten years then, on the basis of some properties experiencing frequent turnover without material alteration in terms of energy performance, some decline in the demand for assessments may take place over time.
b. Normal efficiencies deriving from experience, allied to improvements in ICT technologies for surveying and integration with calculation procedures, may offer some prospect of improved productivity.

However, in the early years of the process, it can be expected that the overall volume of property market activity – which is, *pro rata*, particularly high in Ireland at present - will be the most significant factor determining the need for assessments.

(viii) As suggested above, to ensure a competitive market with full geographical coverage, some excess or redundancy on the above estimated minimum nominal number of active assessors would be desirable. From the limited experience in other countries, many registered assessors may choose to deliver BER services on a part time basis only. An assessor spending on average 25% of chargeable professional time rating existing homes would be expected to produce approximately 100 BERs per annum. An assessor rating mainly rural one off homes will produce fewer BERs per year than an assessor rating large urban housing estates or apartment developments. Similarly architects providing BERs of homes as an additional service to their core services will typically only spend a small percentage of their time on this activity.

(ix) It is difficult to estimate what level of overcapacity is necessary to ensure a competitive market in relation to a service which is mandatory, and in which a majority of the service providers may have alternative economic service outlets or demands for their professional time. A figure of 20% might be considered as a prudent minimum, suggesting a requirement of 1,200 trained and registered assessors in order to achieve the target of 1,000 active assessors. In Denmark, where BER is already mandatory for housing, less than half of the registered assessors produced all the BERs issued in 2003. This would appear to indicate that twice as many assessors would need to be trained and registered as might be ultimately required. Applied to Ireland, this would suggest a need for up to 2,000 trained and registered assessors for housing.