

*IBCI Conference 2007:*

*Bunratty Shannon Shamrock Hotel*

*22-23 March 2007*



# EU Energy Performance of Buildings Directive (EPBD): Live developments and priorities

Requirements, Legislation, Operations, Implications

**Kevin O'Rourke**  
Head, Built Environment  
Sustainable Energy Ireland



**sei** SUSTAINABLE  
ENERGY  
IRELAND



# Sustainable Energy Ireland



- **Statutory authority, established 1 May 2002**
- **Promoting and assisting sustainable energy:**
  - **Delivering programmes as directed by Government**
  - **Providing policy advice to Government**
  - **Networking with market players**
- **Five teams including Built Environment**
- **C. 50 full time staff, statutory Board**
- **Reporting to Dept. of Communications, Marine & Natural Resources**

# SEI Built Environment: Selected Programmes & Activity Levels



PROGRAMME	FOCUS	PROGRESS INDICATOR
EPBD implementation	Building Energy Rating, consumer information	Action Plan, legislation, BER, 10,000 consulted
House of Tomorrow	Innovation	> 100 demo projects, 5000 homes, 8 LAPs
Low Income Housing	Affordable warmth	10,000 homes, network of 18 installers
Greener Homes Scheme	Renewable heating systems deployment	13,000 homes – biomass, solar, heat pumps
Bioheat & CHP (non-domestic)	Small to medium scale deployment	29 bioheat projects, 9 CHP projects
Public & Commercial Sector	Leadership, Capacity Building	150 projects, 30 professional practices
SEBNet/ Standards/ Certification	Industry led best practice	40 members

# Presentation

- **Background**
- **EPBD Requirements**
- **Legislation**
- **Operations**
- **Training**
- **Expected Impacts**
- **Conclusions**
- **Further Information**

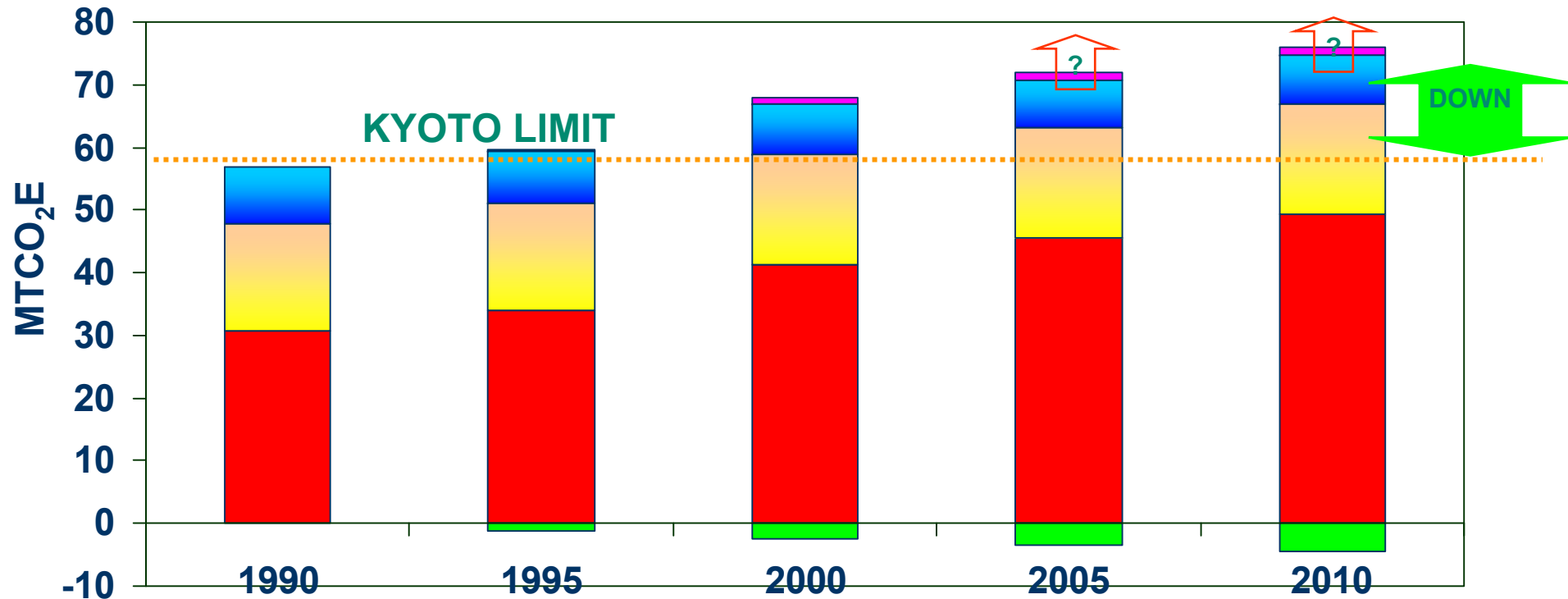
# Kyoto Protocol



Under the Kyoto Protocol Ireland's target is to limit its greenhouse gas emissions to 13% above 1990 levels by 2012.

# Ireland's Greenhouse Gas Emissions

- Carbon Dioxide
- Methane
- Nitrous Oxide
- Industrial gases
- Forestry Sinks

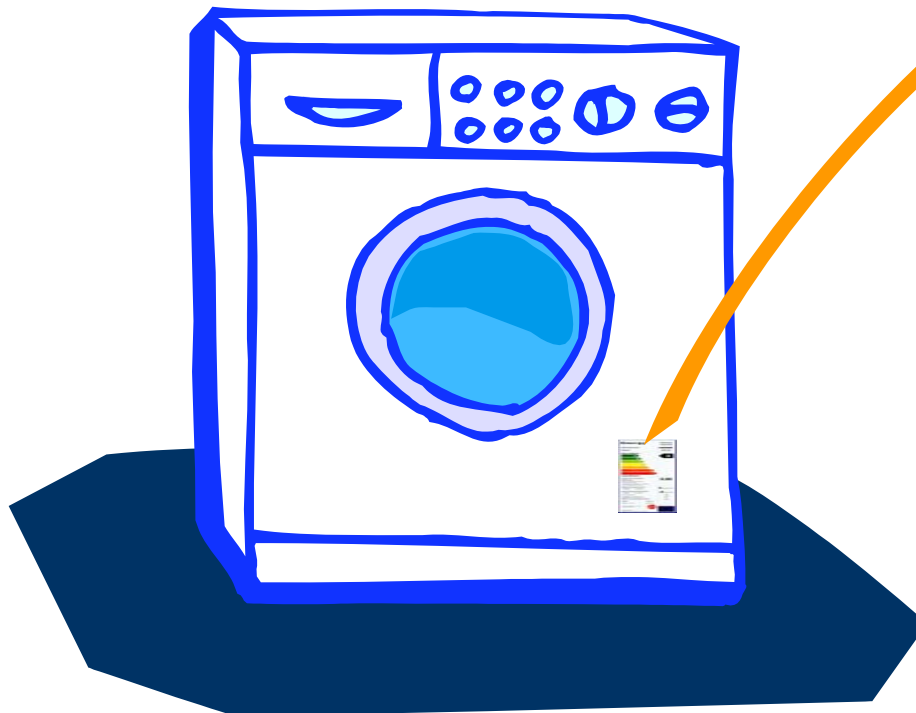


## Residential & Non-residential buildings



- 45% of Ireland's energy use
- Energy spend €3 Billion p.a.
- 20Mt CO<sub>2</sub> emitted p.a.
- Energy saving potential >20%

# Proven Success of Energy Labelling



Energy		Washing machine
Manufacturer Model		
<b>More efficient</b> 		<b>A</b>
Energy consumption kWh/cycle <small>Based on standard load washing at 60°C normal cycle</small> <small>Actual energy consumption will depend on how the appliance is used</small>		<b>1.55</b>
Washing performance <small>A higher - G lower</small>		<b>A B C D E F G</b>
Spin drying performance <small>A higher - G lower</small> Spin speed (rpm)		<b>A B C D E F G</b> 1400
Capacity (cotton) kg		6.0
Water consumption		6.6
Noise (dB(A) re 1 pW)		Washing 62 Spinning 7.6
Further information is contained in product literature		
New EU label Labels are rated by SEI Mark and Euron		

# The EPBD

# The EPBD

EN

Official Journal of the European Communities

**DIRECTIVE 2002/91/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL  
of 16 December 2002  
on the energy performance of buildings**

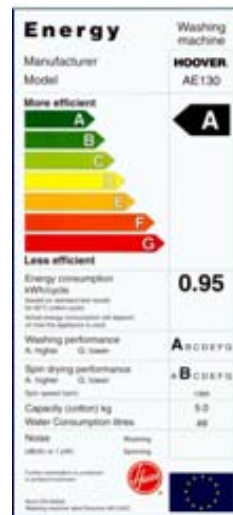
# EPBD Key Requirements

- **Minimum energy performance requirements – new buildings & major renovations (“material alterations”)**
- **BER and Advisory Report - new & existing buildings when constructed, sold or rented**
- **BER Public Service Buildings (continuous requirement)**
- **Feasibility assessment of Alternative Energy Systems (AES) (new buildings >1,000m<sup>2</sup>)**
- **Energy efficiency of boilers and heating systems (inspection or advice)**
- **Inspection of air-conditioning systems (>12 kW)**

# Summary of EPBD Requirements

## Compulsory provision to (or by) building owners of:

- Information & Advice
- Independent & Actionable



### Advisory Report

Options for improvement:

- Insulation
- Glazing
- Heating systems
- Controls
- Lighting
- Boilers
- Renewables

# Responsibility in Ireland



- **Dept. of Environment, Heritage and Local Government**
- **Dept. of Communications, Marine & Natural Resources**
- **SEI**
- **Interdepartmental Working Group**  
– now “Implementation Group”

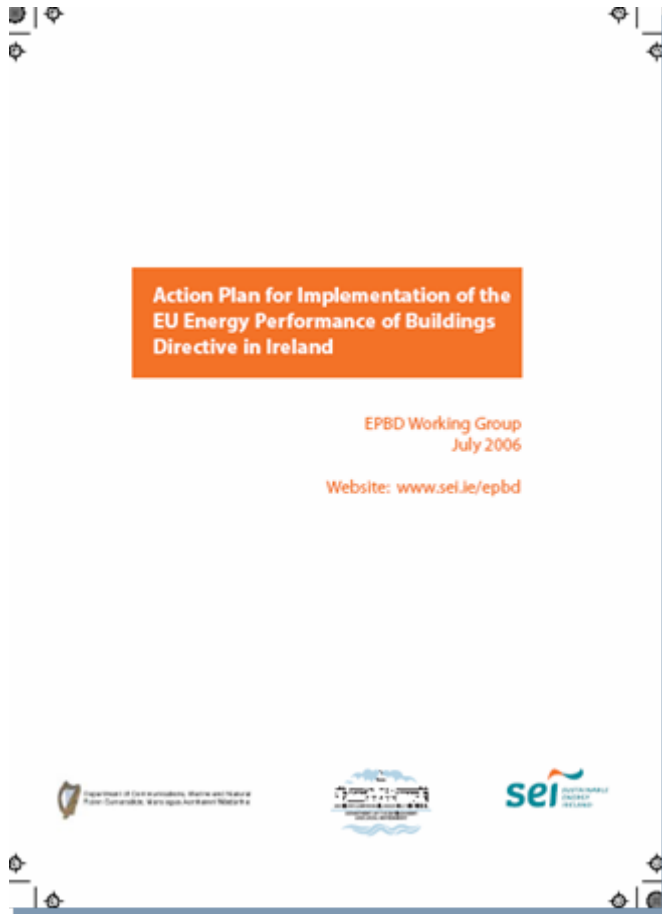
# Implementing Legislation

- **Building Control Bill\* & Regulations SI 875 of 2005 (Dec 05)**
- **Revised Building Regulations by SI 873 of 2005 (Dec 05)**
- **Revised Technical Guidance Document L (May 06)**
- **Inspection of A/C Systems Regulations by SI 346 of 2006 (June 06)**
- **\* Replaced with Energy Performance of Buildings Regulations by SI 666 of 2006 (Dec 06)**
- **Listed buildings etc. are EXEMPT**
- **“Major renovations”: requirements to be applicable to “material alterations”**

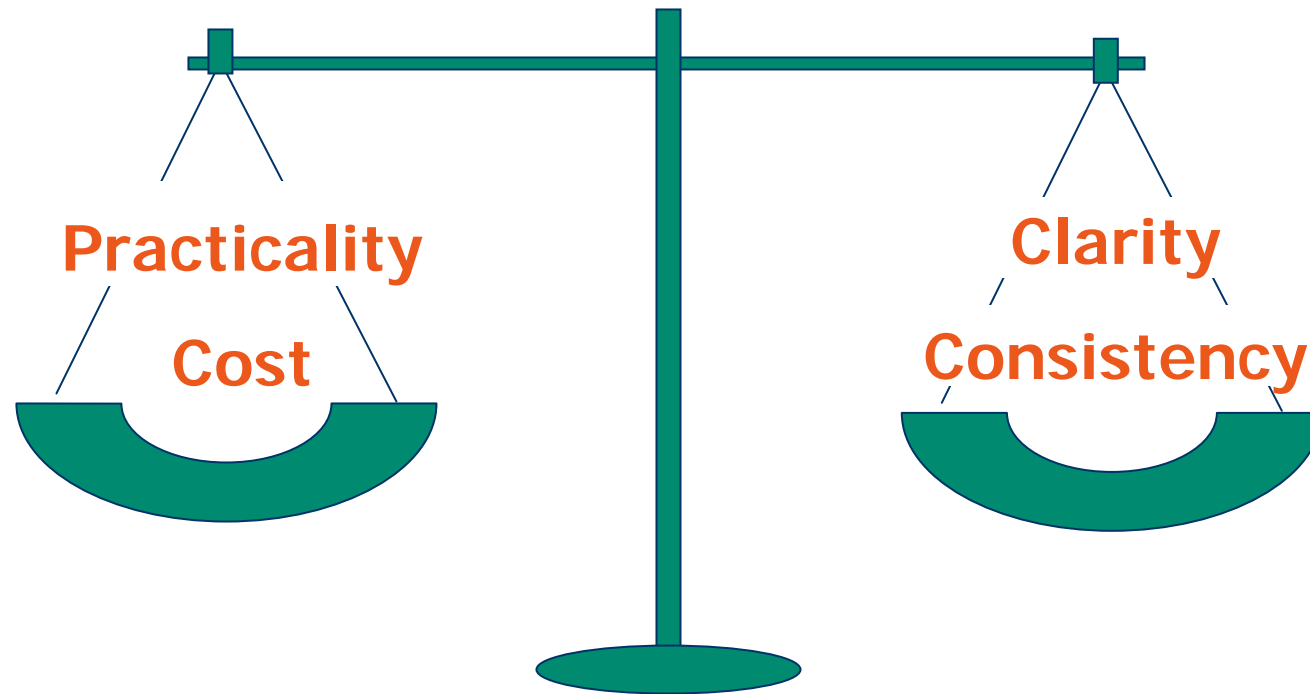
# Implementation in Ireland: Action Plan

Action Plan for Implementation  
of EPBD in Ireland published  
July '06

[www.sei.ie/epbd](http://www.sei.ie/epbd)



# Key Implementation Principles: Balance Requirements



# EPBD Action Plan Structure

**Section 1:  
Overview, Requirements, Principles, Timescale**

**Section 2:  
Policy,  
Legislation**

**Section 3:  
Institutional  
Arrangements**

**Section 4:  
Technical Systems  
Development**

**Section 5:  
Potential Impacts**

**Section 6:  
Consultation, Promotion, Information**

**Appendices  
Including Draft Timetable for Implementation**

# Proposed Timetable – Building Energy Rating (Section 2)

## January 2007

- BER for new dwellings

## July 2008

- BER for new non-residential buildings
- BER for new public service buildings

## January 2009

- BER for existing dwellings
- BER for existing non-residential buildings
- BER for existing public service buildings

**Transitional  
arrangements per the  
EC (Energy  
Performance Of  
Buildings)  
Regulations 2006  
(Dec 06)**

# Proposed Timetable – Other Key Requirements (Section 2)

## July 2006

- Minimum energy performance standards for major renovations
- Building energy performance standards [Phase 1]

## January 2007

- Feasibility assessment of Alternative Energy Systems (AES)

## January 2008

- Building energy performance standards [Phase 2]
- Energy efficiency of large boiler systems
- Inspection of large air-conditioning systems

# Technical Systems Development Measures (Section 4)

## National Methodologies

- Methods required for BER, boilers and air-conditioning

## Feasibility Assessment of Alternative Energy Systems

- To apply to large new buildings >1,000m<sup>2</sup> from **January 2007**
- National study, software and guide to assist design teams

## Software

- Software required for calculation and administration

## Advisory Report

- Recommendations for energy performance improvements

# Technical Systems Development Measures (Section 4)

## Estimated Cost & Timescale (BER & Advisory Report)

- Cost - estimated at up to €300 per house for BER
- Target turnaround time <2 weeks for housing

## Training and Accreditation of Assessors & Inspectors

- Certified assessors and inspectors required
- BER Residential Market: Estimate of up to 2,000 full and/or part-time assessors for housing alone
- Drawn from existing base of building professionals

## Underpinning Systems

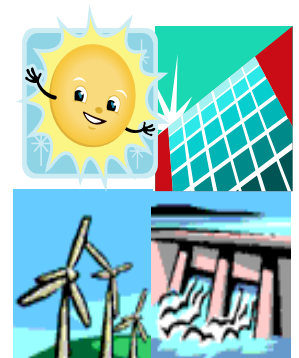
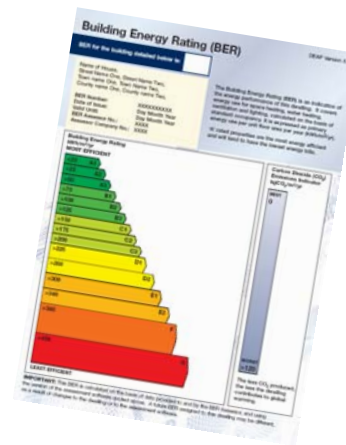
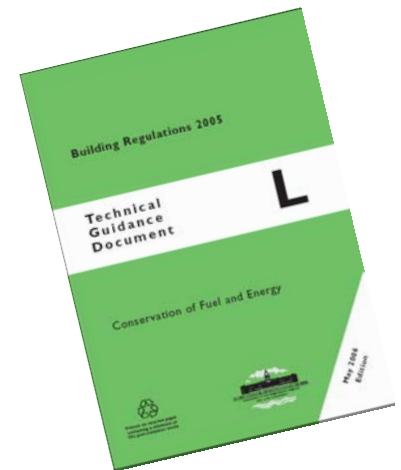
- National databases, Administration Systems, QA, auditing

# Consultation, Promotion & Information (Section 5)

- Consultation with interested parties
- Information sessions/workshops
- Promotion and information campaign to be developed
- National EPBD website – [www.epbd.ie](http://www.epbd.ie)

# Responsibilities/ Implications for Building Control

- Building Regulations Part L compliance
- Building Energy Rating
- Alternative Energy Systems assessment



# Main requirements relevant to dwellings

➤ Energy performance standards

**Part L**

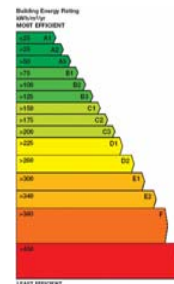


➤ Energy performance of buildings methodology **DEAP**

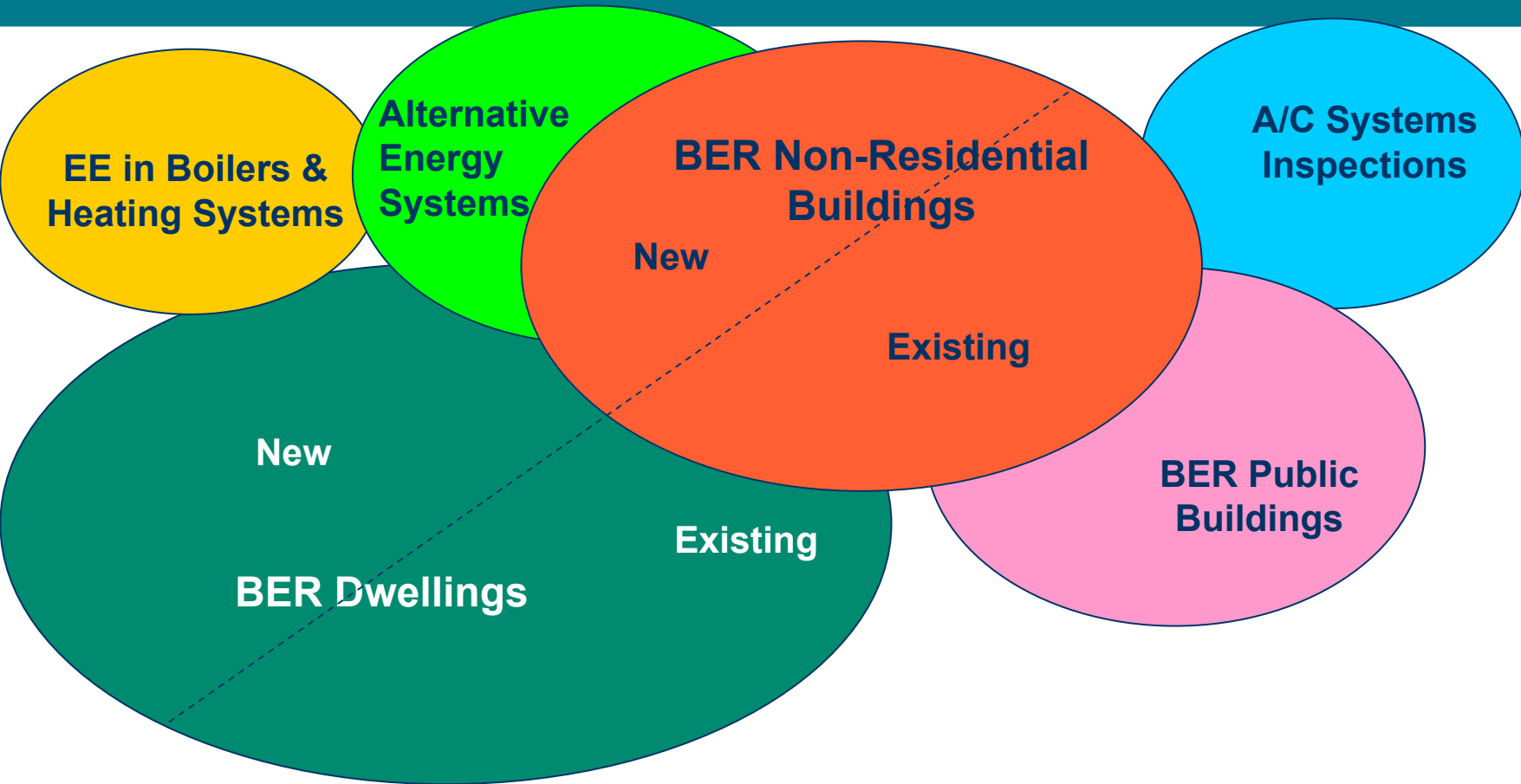
➤ Feasibility alternative energy systems **Passes**



➤ Building Energy Rating (BER)



# EPBD Implementation: Principal Projects/ Task Groups



Co-ordination, consultation, representation, promotion

# EPBD Implementation: Allocation of SEI Tasks & Schedules



Sector / Block of tasks	Housing		Non-residential			Boilers/heating systems	Air conditioning inspection
	New	Existing	New	Existing	Public		
Legislation input	2005-7	2005-7	2005-7	2005-7	2005-7		2005-6
EN standards	2004-6	2004-6	2004-6	2004-6	2004-6	2004-6	2004-6
Methodologies	2005-6	2007-8	2007	2007-8	2007-8	2007-8	2007
Software	2006-7	2008	2007-8	2008	2007-8	2008	(2007-8)
Minimum performance standards TGD L	Done (DEHLG) 2007-8		Partial (DEHLG) 2007				
Alternative energy systems feasibility	2005-7		2005-7				
BER label	2005-6	2005-6	2007	2007-8	2007-8		
Advisory report	2005-6	2007-8	2007	2007-8	2007-8		2007-8
Training system	2006+	2008+	2007+	2008+	2007+	2007-8	2007-8
Administrative system	2007+	2008+	2007+	2008+	2008+	(2007-8)	(2007-8)
Public consultation	2005-8						
Public information and promotion	Ongoing						
Co-ordination & support/ liaison to Govt Depts/ IG, EDMC, CA	Ongoing						

07 Deadline

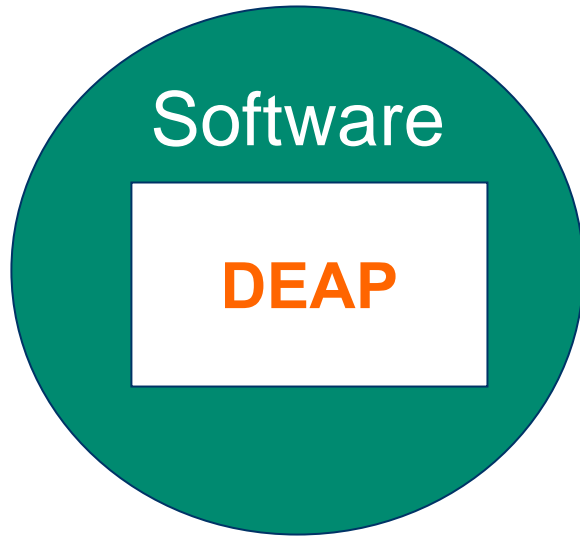
08-09 Deadline

Joint

Done

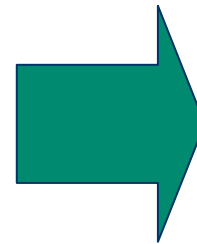
**DEAP**

# Twin role of DEAP



→ **CDER**

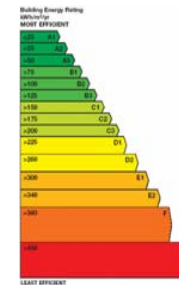
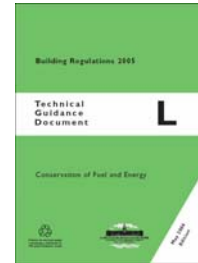
**kg CO<sub>2</sub>/m<sup>2</sup>/year**



**Primary energy**

**kWh/m<sup>2</sup>/year**

→ **BER**



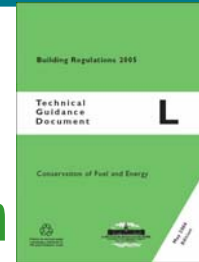
- Advisory Report**  
Options for improvement:
- Insulation
  - Glazing
  - Heating systems
  - Controls
  - Lighting
  - Boilers
  - Renewables

# Key Implementation Dates: Dwellings

January 2002

Time

**Part L**  
Heat Loss Limitation



July 2006\*

**DEAP**

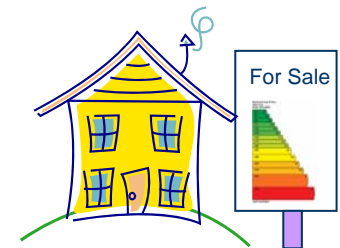
January 2007\*



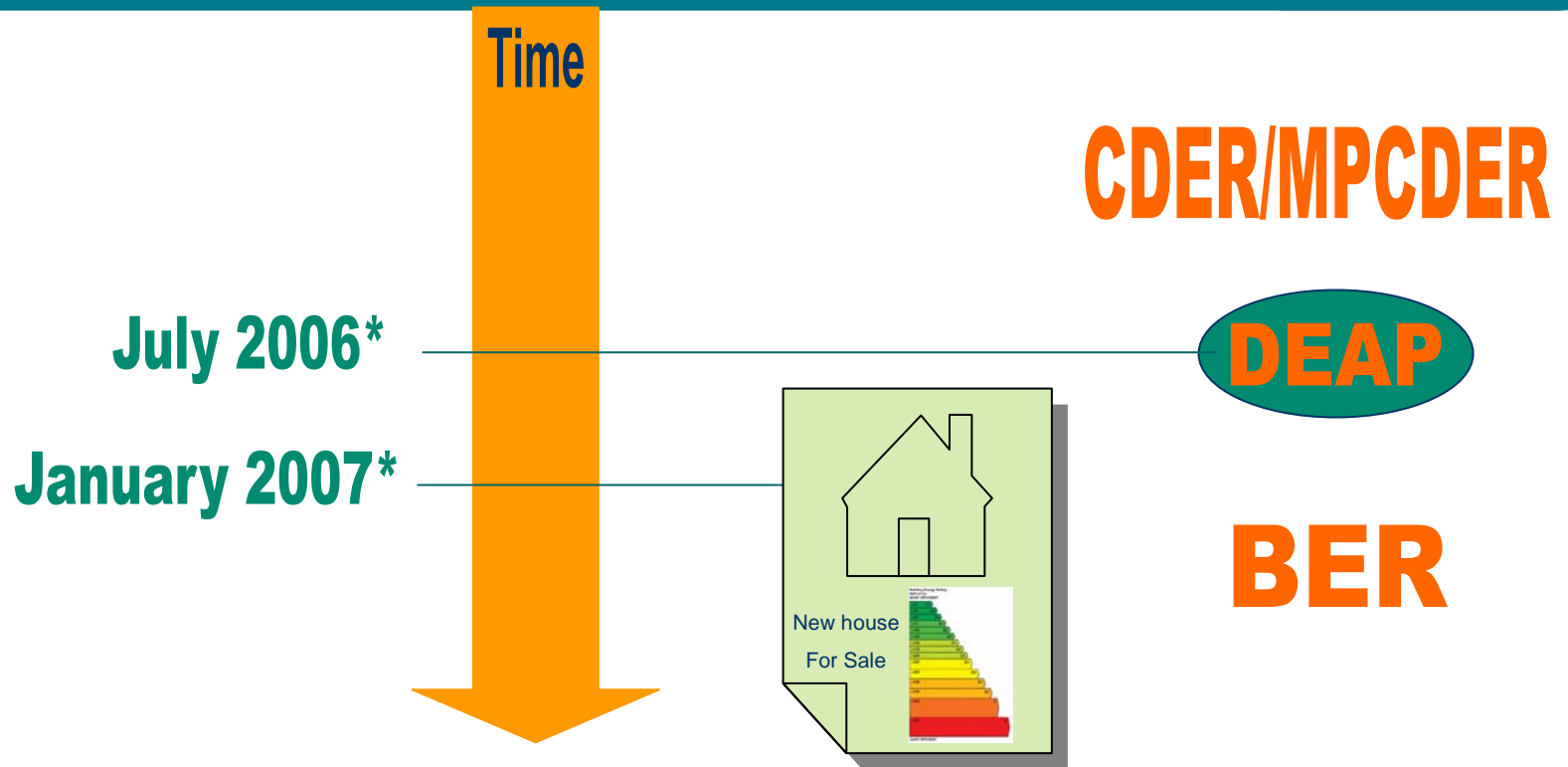
**Passes**



January 2009



# Key Implementation Dates: Dwellings



\* Transitional Exemptions apply for any dwelling for which planning permission is applied before these dates and is substantially completed by 1 July 2008

# Implementing Legislation

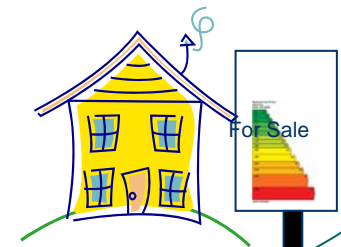
**Building  
Regulations  
(Amendment)  
Regulations 2005**

**Part L  
Heat Loss Limitation**

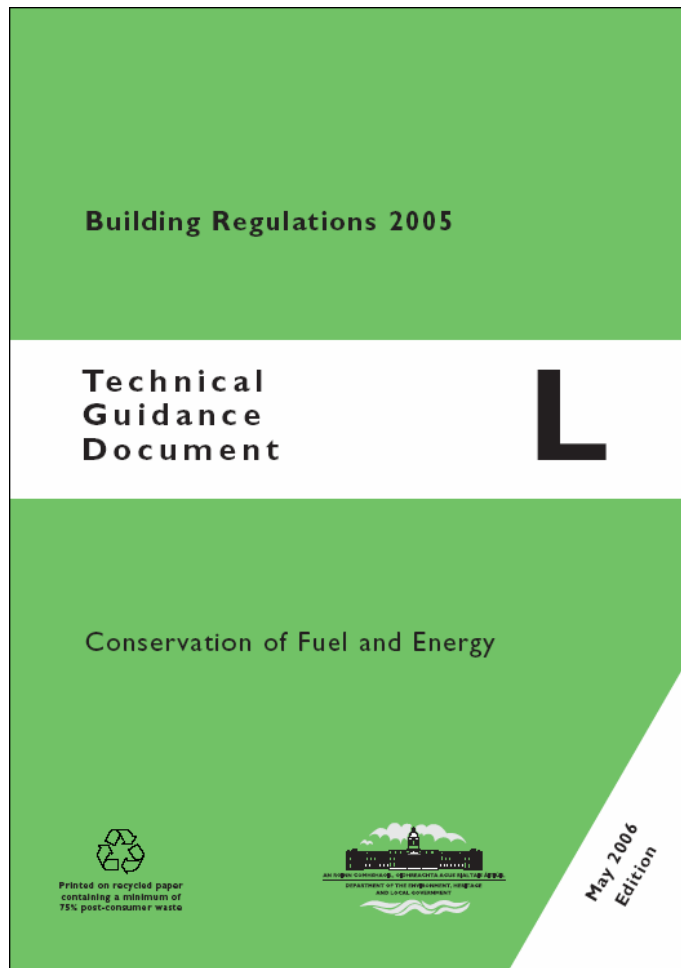


**DEAP**

**European Communities  
(Energy Performance  
of Buildings)  
Regulations 2006**



# TGD L 2006



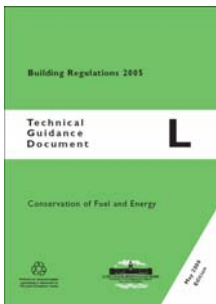
**Limitation of Heat  
Loss through the  
Building Fabric**



**Limitation of CO<sub>2</sub>  
Emissions**

# *Part L*

## *Limitation of Heat Loss through the Building Fabric*



# Limitation of Heat Loss through the Building Fabric

**Elemental Heat Loss Method  
or  
Overall Heat Loss Method**

Requirement  
does not  
vary from  
TGD L 2002

# Maximum average elemental U-Value (W/m<sup>2</sup>K) - Table 2, TGD L 2006

Fabric Elements	New Buildings & Extensions to Existing Buildings	Material Alterations to, or Material Changes of Use of, Existing Buildings
Pitched roof, insulation horizontal at ceiling level	0.16	0.35
Pitched roof, insulation on slope	0.20	0.35
Flat roof	0.22	0.35
Walls	0.27	0.60
Ground Floors	0.25	-
Other Exposed Floors	0.25	0.60
External doors, windows and rooflights	2.20 <sup>1</sup>	2.20

**NOTE:**  
**Applicable if the combined area of external door, window and rooflight openings does not exceed 25% of floor area**

# Floor Insulation

U-value  $0.25\text{W}/\text{m}^2\text{K}$

Thickness of  
similar material  
required: 100mm



# Roof Insulation

U-value 0.16W/m<sup>2</sup>K

Thickness of  
similar  
materials  
required

250-300mm



# Walls -

## U-value 0.27W/m<sup>2</sup>K

Thickness of  
similar materials  
required

100-150mm



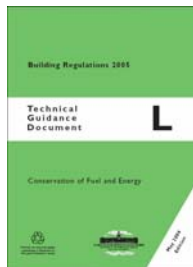
# TGD L Other Issues

- Cold Bridging
- Air infiltration
- Heating Control
- Insulation of hot water storage vessels, pipes & ducts

# *Part L*

## *Limitation of CO<sub>2</sub> Emissions*

DEAP (Dwellings Energy Assessment Procedure)

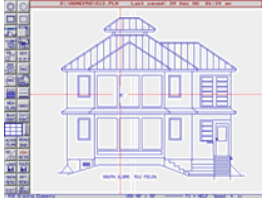


Downloadable from  
[www.sei.ie/epbd](http://www.sei.ie/epbd)

# Limitation of CO<sub>2</sub> Emissions

- Building Regulation
  - CO<sub>2</sub> emissions associated with energy use for space heating, water heating, ventilation and lighting of a new dwelling should be limited as far as is reasonably practicable.
- TGD L 2006 ed
  - The Carbon Dioxide Emission Rate (CDER) associated with the energy use for space heating, water heating, ventilation and lighting for an actual dwelling, should be less than the Maximum Permitted CO<sub>2</sub> Emission Rate (MP CDER) for a reference dwelling.
- “Reference dwelling” is specified in Appendix C of TGD L
- Compliance demonstrated using national methodology **DEAP**
- Demonstration of compliance not restricted to any specific body

## Building dimensions



## Renewable energy



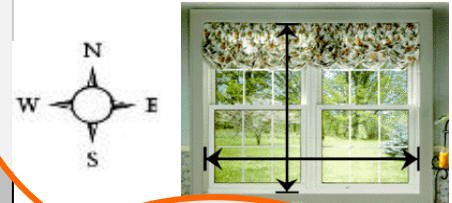
## Fabric Heat Losses



## Hot Water System



## Heat Gains



## Lighting



## Ventilation Rates



## Boiler/ HS Controls Efficiency

Software



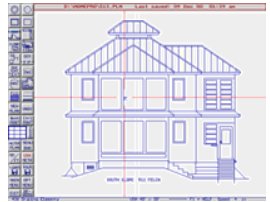
Heating - calculation of adjusted internal temperature during reduced heating period according to EN 12780 Annex C

Take account of control of heating systems (control + responsiveness)

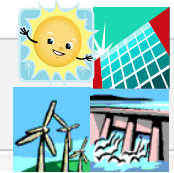
	Calc	Value	Unit	Comment
Internal capacity of dwelling (Q <sub>int</sub> ) [MJ/K]	Q <sub>int</sub>	19	[MJ/K]	1.90E+02 calculated value
Area of heat loss of the heavy structure [m <sup>2</sup> ]	A	455	[m <sup>2</sup> ]	455 as used in heat loss calculation
U <sub>0</sub> for heat loss of these elements [W/m <sup>2</sup> ·K]	U <sub>0</sub>	0.13	[W/m <sup>2</sup> ·K]	
U <sub>0</sub> for heat loss of these elements [W/m <sup>2</sup> ·K]	U <sub>0,ext</sub>	21.00	[W/m <sup>2</sup> ·K]	Default 18.75; based on setpoint temp of 20°C and design heat loss
Set-point [°C]	sp	20.00	[°C]	
Maximum power of heating system [kW]	ph2	200.00	[kW]	
Type of control during reduced heating periods	phv	1		1: cutoff, 2: reduced heating power, 3: setpoint
Type of boost strategy	ph1	2		1: fixed time, 2: optimized
Definition of reduced heating period	phd	1		
Duration of reduced heating period [h]	phd	8	[h]	38800
Transmission heat loss coeff of lightweight elements [W/m <sup>2</sup> ·K]	phv	0.20	[W/m <sup>2</sup> ·K]	
Transmission heat loss coeff (during reduced heating period)	phv	0.20	[W/m <sup>2</sup> ·K]	assume equal to average value
Transmission heat loss coeff (during reduced heating period)	phv	238	[W/m <sup>2</sup> ·K]	assume equal to average value
Time mode, predefined duration of boost heating phase [h]	ph1	175	[h]	3880
Time mode, setback temperature [°C]	ph1	17.5	[°C]	
Maximum power mode, reduced heating power [W]	ph1	0	[W]	0 to account for heating system responsiveness
External temp [°C]	ph1	6.5	[°C]	mean for Nov-Apr
Subcategory of control responsiveness	ph1	1		1 is 5, as in SAP
Response category	ph1	0		
Factor for separation of design heat loss that is omitted during reduced heating period	ph1	2000		
Heat loss to maintain setpoint temp. in steady state	ph1	0		
Heating power during reduced heating period due to non-ideal response	ph1	18.81	[kW]	

**kgCO<sub>2</sub>/m<sup>2</sup>/year → CDER (TGD L)**  
**kWh/m<sup>2</sup>/year → BER**

**Building dimensions**



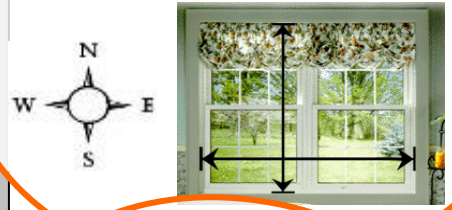
**Renewable energy**



**Fabric Heat Losses**



**Heat Gains**



**Hot Water System**



Heating - calculation of adjusted internal temperature for the reduced heating period			
according to EN 12780 Annex C			
This spreadsheet implements only cutoff and reduced heating power control, as specified in the standard			
Please note on this instance of worksheet: <b>Takes account of control of heating systems (controls + responsiveness)</b>			
Internal capacity of dwelling (Q <sub>int</sub> ) [MJ/K]	Q <sub>int</sub>	19	1900*0.7 calculated value
Area of external walls of the heavy structure [m <sup>2</sup> ]	A <sub>e</sub>	455	as used in heat transfer
U <sub>0</sub> for external walls of these elements [m <sup>2</sup> K/W]	U <sub>0</sub>	0.13	
Set-point temperature [°C]	theta <sub>int,0</sub>	21.00	Default 18.75: based on set-point temp of 21.00 and average heat loss
Maximum power of heating system [kW]	phi <sub>h,2</sub>	2600	0.5
Type of control during reduced heating periods			1: cutoff, 2: reduced heating power, 3: variable
Type of boost strategy			1: fixed time, 2: optimized
Definition of intervention pattern			
Duration of reduced heating period [h]	td	8	30000
Transmission heat loss coeff. of lightweight elements [W/m <sup>2</sup> K]	U <sub>0</sub>	0.20	
Internal heat loss coeff. (W/m <sup>2</sup> K) during reduced heating period	phi <sub>v</sub>	0.20	assume equal to average value
Internal heat loss coeff. (W/m <sup>2</sup> K) during reduced heating period	phi <sub>2</sub>	238	assume equal to average value
Time mode, predefined duration of boost heating phase [h]	td <sub>2</sub>	175	3600
Time mode, outside temperature [°C]	theta <sub>o,2</sub>	6.00	to account for holding system responsiveness
Maximum power mode, reduced heating power [kW]	phi <sub>h,1</sub>	0	to account for holding system responsiveness
External temperature [°C]	theta <sub>o,E</sub>	6.00	mean for Nov-Apr
Substitution factor, Responsiveness			
Responsiveness category		1	1 is 5, as in SAP
Factor for separation of design heat loss that is omitted during reduced heating period		0	
Hour to maintain set-point temp. in steady state		2000	
Heating power during reduced heating period due to non-ideal responsiveness [IC]		0	
Result			
Adjusted internal temperature [°C]	theta <sub>int,adj</sub>	18.81	
Adjusted internal temperature [°C]	theta <sub>int,adj</sub>	18.81	

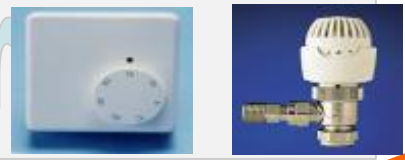
**Lighting**



**Ventilation Rates**



**Boiler/ HS Controls Efficiency**



**Software**

## Menu

-  [Import calculation data](#)
-  [Complete assessment](#)
-  [Find existing record](#)

## Options

-  [Save](#)
-  [Clear all fields](#)
-  [Detailed Report](#)
-  [Export results](#)

Results 

Energy Value  
Energy Rating:  
CDER:  
MPCDER:

## Start

Start

Property and  
assessor details

Dimensions

Ventilation

Building elements

Water heating

Lighting and internal  
gainsNet space heat  
demandDist. system losses  
and gains

Energy requirements

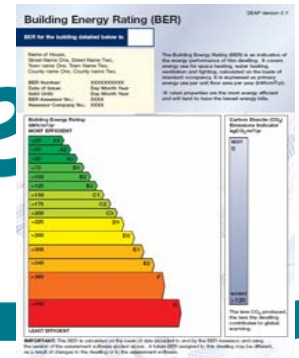
Summer internal  
temperature

Results

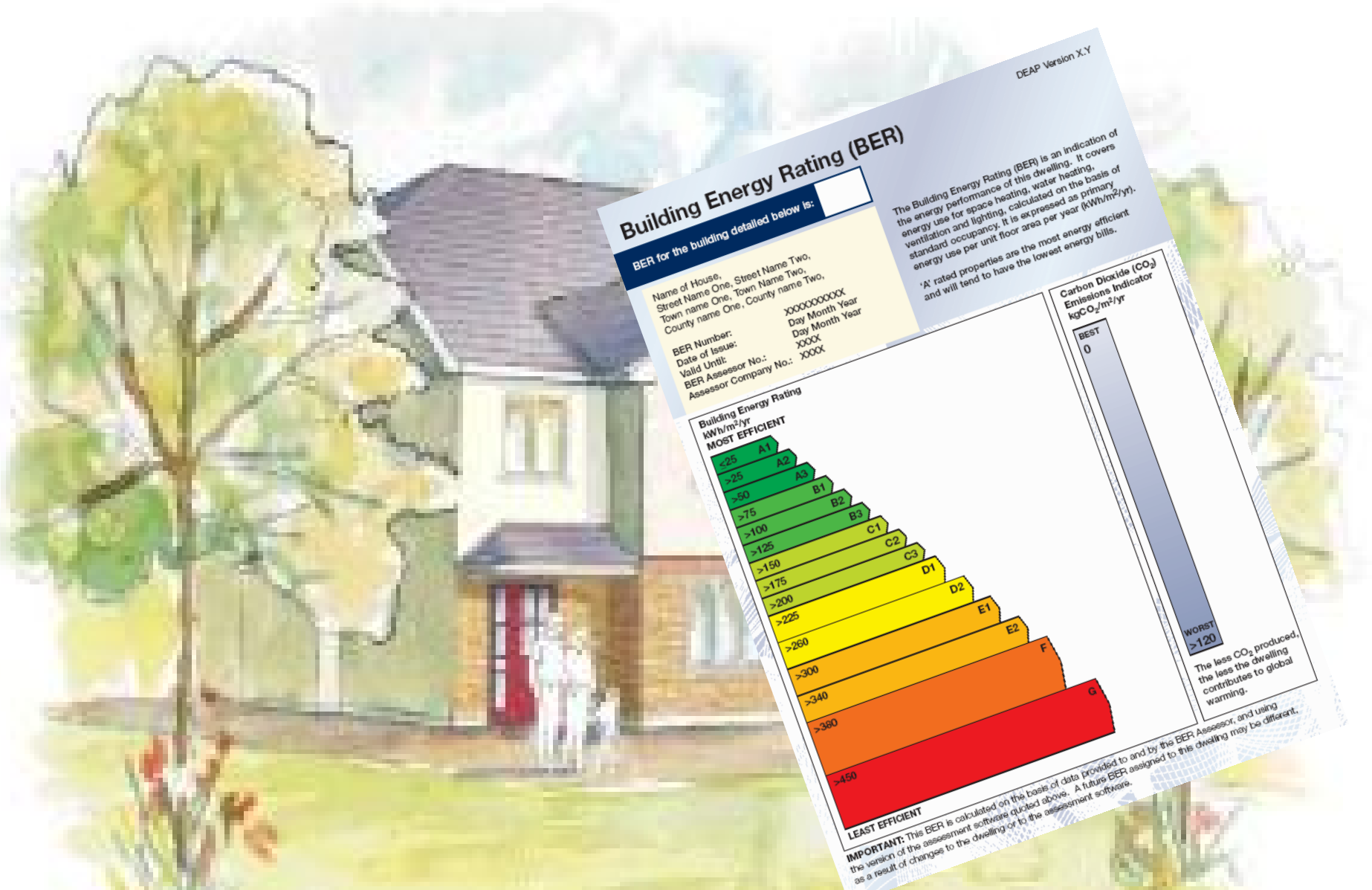
Dwelling type

House  Enter a batch of dwellings

se



# Building Energy Rating



# Building Energy Rating (BER)

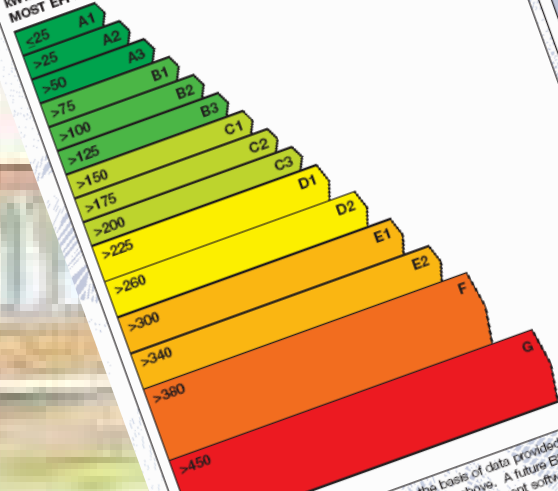
BER for the building detailed below is:

Name of House: \_\_\_\_\_  
Street Name One, Street Name Two, \_\_\_\_\_  
Town Name One, Town Name Two, \_\_\_\_\_  
County Name One, County Name Two, \_\_\_\_\_

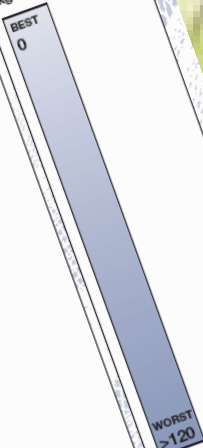
BER Number: XXXXXXXXXX  
Date of Issue: XXXX  
Valid Until: XXXX  
BER Assessor No.: XXXX  
Assessor Company No.: XXXX

The Building Energy Rating (BER) is an indication of the energy performance of this dwelling. It covers energy use for space heating, water heating, ventilation and lighting, calculated on the basis of standard occupancy. It is expressed as primary energy use per unit floor area per year (kWh/m²/yr). 'A' rated properties are the most energy efficient and will tend to have the lowest energy bills.

Building Energy Rating  
kWh/m²/yr  
MOST EFFICIENT



Carbon Dioxide (CO<sub>2</sub>)  
Emissions Indicator  
kgCO<sub>2</sub>/m²/yr



The less CO<sub>2</sub> produced, the less the dwelling contributes to global warming.

**IMPORTANT:** This BER is calculated on the basis of data provided to and by the BER Assessor, and using the version of the assessment software quoted above. A future BER assigned to this dwelling may be different, as a result of changes to the dwelling or to the assessment software.

Dwellings that APPLY for planning permission after 1 January 2007 need a BER before they are offered for sale.

# Building Energy Rating (BER)

DEAP Version X.Y

## Building Energy Rating (BER)

BER for the building detailed below is:

Name of House, Street Name One, Street Name Two, Town name One, Town Name Two, County name One, County name Two,

BER Number: XXXXXXXXX  
Date of Issue: Day Month Year  
Valid Until: Day Month Year  
BER Assessor No.: XXXX  
Assessor Company No.: XXXX

The Building Energy Rating (BER) is an indication of the energy performance of this dwelling. It covers energy use for space heating, water heating, ventilation and lighting, calculated on the basis of standard occupancy. It is expressed as primary energy use per unit floor area per year (kWh/m<sup>2</sup>/yr).

'A' rated properties are the most energy efficient and will tend to have the lowest energy bills.

Rating	Energy Use (kWh/m <sup>2</sup> /yr)
A1	<25
A2	>25
A3	>50
B1	>75
B2	>100
B3	>125
C1	>150
C2	>175
C3	>200
D1	>225
D2	>260
E1	>300
E2	>340
F	>380
G	>450

Carbon Dioxide (CO<sub>2</sub>) Emissions Indicator (kg/m<sup>2</sup>/yr)

0  
BEST

WORST  
>120

The less CO<sub>2</sub> produced, the less the dwelling contributes to global warming.

- Calculated using DEAP
- BER relates to primary energy kWh/m<sup>2</sup>/y
- No minimum standard
- Linear Scale
- Must be produced by Registered BER Assessor
- Valid 10 years unless changes are made to building

**IMPORTANT:** This BER is calculated on the basis of data provided to and by the BER Assessor, and using the version of the assessment software quoted above. A future BER assigned to this dwelling may be different, as a result of changes to the dwelling or to the assessment software.

# Provisional Building Energy Rating

DEAP Version X.Y

## Provisional Building Energy Rating (BER)

Provisional BER for the building detailed below is:

Name of House,  
Street Name One, Street Name Two,  
Town name One, Town Name Two,  
County name One, County name Two,

BER Number: XXXXXXXXX  
Date of Issue: Day Month Year  
Valid Until: Day Month Year  
BER Assessor No.: XXXX  
Assessor Company No.: XXXX

The Building Energy Rating (BER) is an indication of the energy performance of this dwelling. It covers energy use for space heating, water heating, ventilation and lighting, calculated on the basis of standard occupancy. It is expressed as primary energy use per unit floor area per year (kWh/m<sup>2</sup>/yr).

'A' rated properties are the most energy efficient and will tend to have the lowest energy bills.

Building Energy Rating kWh/m <sup>2</sup> /yr	Carbon Dioxide (CO <sub>2</sub> ) Emissions Indicator kgCO <sub>2</sub> /m <sup>2</sup> /yr
<25 A1	BEST 0
>25 A2	
>50 A3	
>75 B1	
>100 B2	
>125 B3	
>150 C1	
>175 C2	
>200 C3	
>225 D1	
>260 D2	
>300 E1	
>340 E2	
>380 F	
>450 G	WORST >120

LEAST EFFICIENT

IMPORTANT: This provisional BER is calculated on the basis of pre-construction plans and specifications provided to the BER assessor, and using the version of the assessment software quoted above. The BER assigned to this dwelling on completion may be different, in the event of changes to those plans or specifications, or to the assessment software.

- ADDITIONAL requirement if selling off-plans
- When the dwelling is completed, a BER certificate that represents the buildings as constructed must be supplied to the purchaser
- Same scale as a BER
- Valid for 2 years

The BER provides you with an indication of the overall energy efficiency of your home. It is calculated using an official, standard methodology (Dwelling Energy Assessment Procedure (DEAP)). This information has been produced by a registered assessor who has signed up to a code of practice and is subject to quality assurance auditing.

This BER is based on the following data:

**Address:**

**Grid Reference:**

**Planning Reference:**

**Built Form:** (e.g. apartment, semi-detached, detached, bungalow, etc.)

**Area of House (m<sup>2</sup>):**

**Number of Bedrooms:**

**Number of Storeys:**

**Ventilation Air Leakage Characteristics:** (e.g. chimneys, flues, fans, air leakage testing)

**Type of Ventilation:** (e.g. natural, mechanical, heat recovery)

**Roofs (U Value):**

**Windows (Type & U Value):** (e.g. double glazed, U Value = 2.2)

**Walls (U value):**

**Doors (U value):**

**Floors (U value):**

**Boiler Type:** (e.g. condensing/non-condensing)

**Efficiency of Main Heating System (%):**

**Primary Fuel / Heating Systems:** (e.g. gas / oil / wood pellet, etc.)

**Secondary Fuel / Heating System:** (e.g. gas / electric / coal, etc)

**Emitters:** (e.g. radiators, under floor heating, etc.)

**Heating System Controls:** (e.g. thermostat, type of programmer, zone controls, TRVs, separation of domestic hot water and space heating)

**Efficiency of Water Heater (%) :**

**Hot Water Storage Insulation (type & thickness):**

**Hot Water Controls:**

**% of Low Energy Lights:**



# BER Assessment Process for NEW Dwellings



Building Owner engages BER assessor to conduct assessment

Assessor Completes Assessment Locally and Assigns BER Number

Assessor Submits Assessments to SEI by Email

SEI Validates Submission,  
Releases for Publication on Web Site

Public Data

Private Data

BER Certificate printed  
Advisory Reports are standardised and can be  
printed from SEI website

- BER Certificates are valid for up to 10 years and all dwellings will require BER if offered for sale/rent after January 2009.

## Exercise Due Care

- Building owner and assessor sign contract
- Assessment limitations or caveats should be discuss and documented
- Building Owner and Assessor co-sign an “Information Form” that document agreement of information that is included in an assessment

# BER Cost

- The cost of BERs will be determined by market
- Expected costs will:
  - generally not exceed €300 for a new dwelling;
  - <€300 for standard housing estate/apartment dwelling.
- Fee for BER payable by the builder/developer
- Minister for Environment, Heritage and Local Government can set maximum fees if necessary

# Administration System

## Long Term Plan

- **Managed by a third party body, cf. NCT**
- **Contract will be awarded by competitive tender**
- **Reporting to the Administration Committee**

## Interim Plan

- **SEI will manage the system**



# BER Assessors

# EPBD – Article 10

## *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.

# **BER Assessors**



**New demand for assessors**



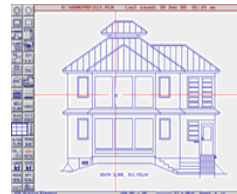
**Up to 1,000 active qualified persons will be required to service Ireland's housing market needs (new and existing)**



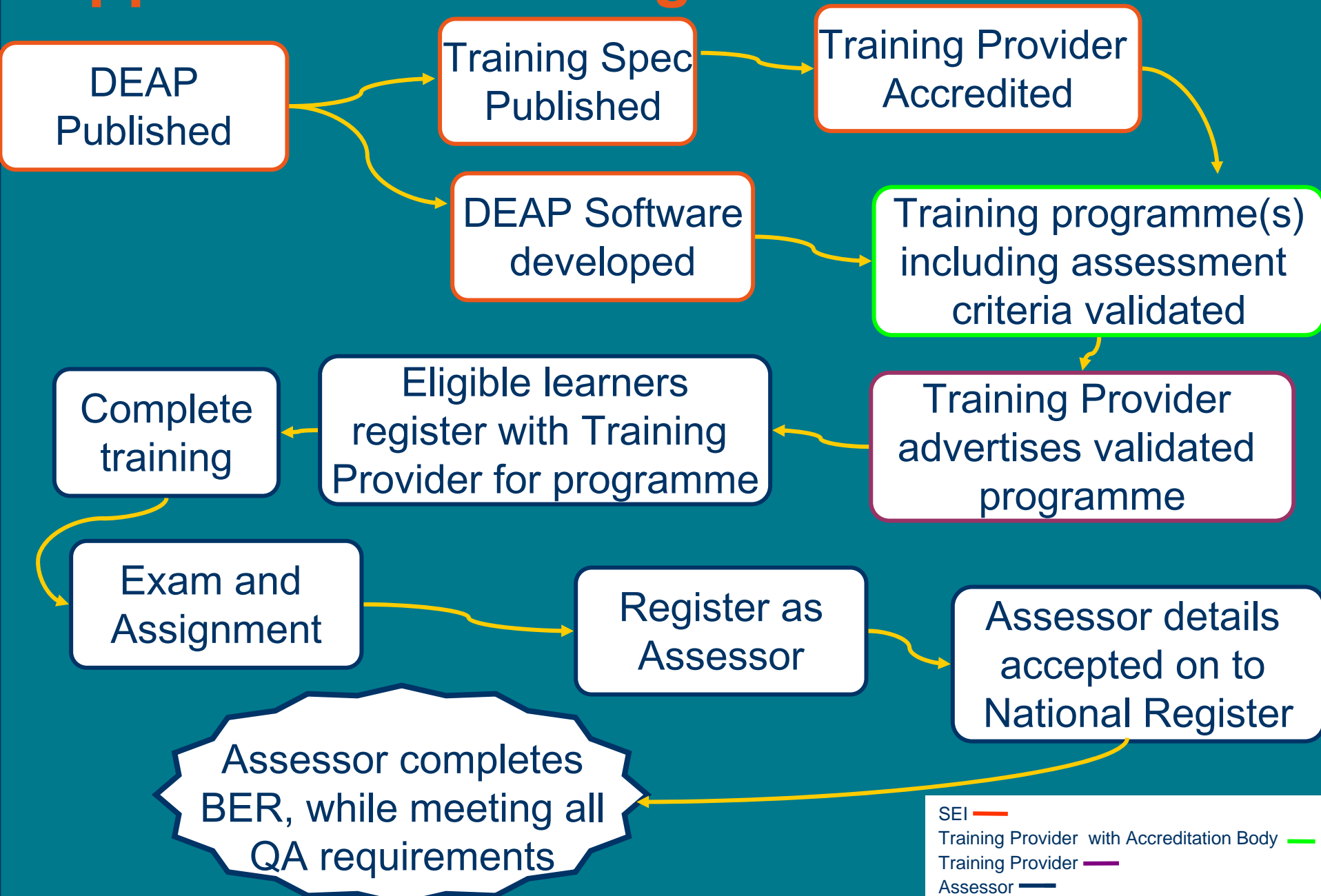
**Up to 2,000 persons will need to be trained by 2009**

# Training Courses

- BER ratings can only be calculated by persons who have successfully attained at least 70% in a recognised course.
- EPBD Implementation Group issued a Training Requirements Specification (October 2006)
- Programmes must meet specified learning outcomes detailed in the Specification e.g.
  - Understanding of energy performance principles
  - Calculation of U values
  - Interpreting drawings/specifications
  - Capable of using the official DEAP software
- 3 training providers have been accredited to date
- All training details are posted on [www.sei.ie/epbd](http://www.sei.ie/epbd)



# Approach to Training



# BER Assessors 1

- Registers as an individual
- Provision for support of employer/ principal
- Obligation to act in an independent manner
- Ongoing requirement to maintain/ develop competence
- Responsibility, within reason, for veracity of base documentation
- Indemnification of SEI
- Insurance highly recommended but not required
- Responsible for maintenance of records, data and documentation
- Confidentiality and data protection obligations

# Code of Conduct 2

- Client service
- Charges and levies
- Advertising and sales promotion
- Use of technology resources (DEAP Software)
- Monitoring by SEI and compliance
- Appeals, complaints and disputes
- Public registers managed by SEI
  - Register of BER assessors
  - Register of BER certificates

**Assessor** registration process will involve the following:

- Meeting technical competency requirements;
- Signing registration form and BER Assessor Code of Conduct;
- (Option: nominate employer to sign commitments in relation to administrative and payment obligations)
- Payment of registration fee

**It is expected that assessors will have to re-register periodically**

**Registration will open in April 2007**

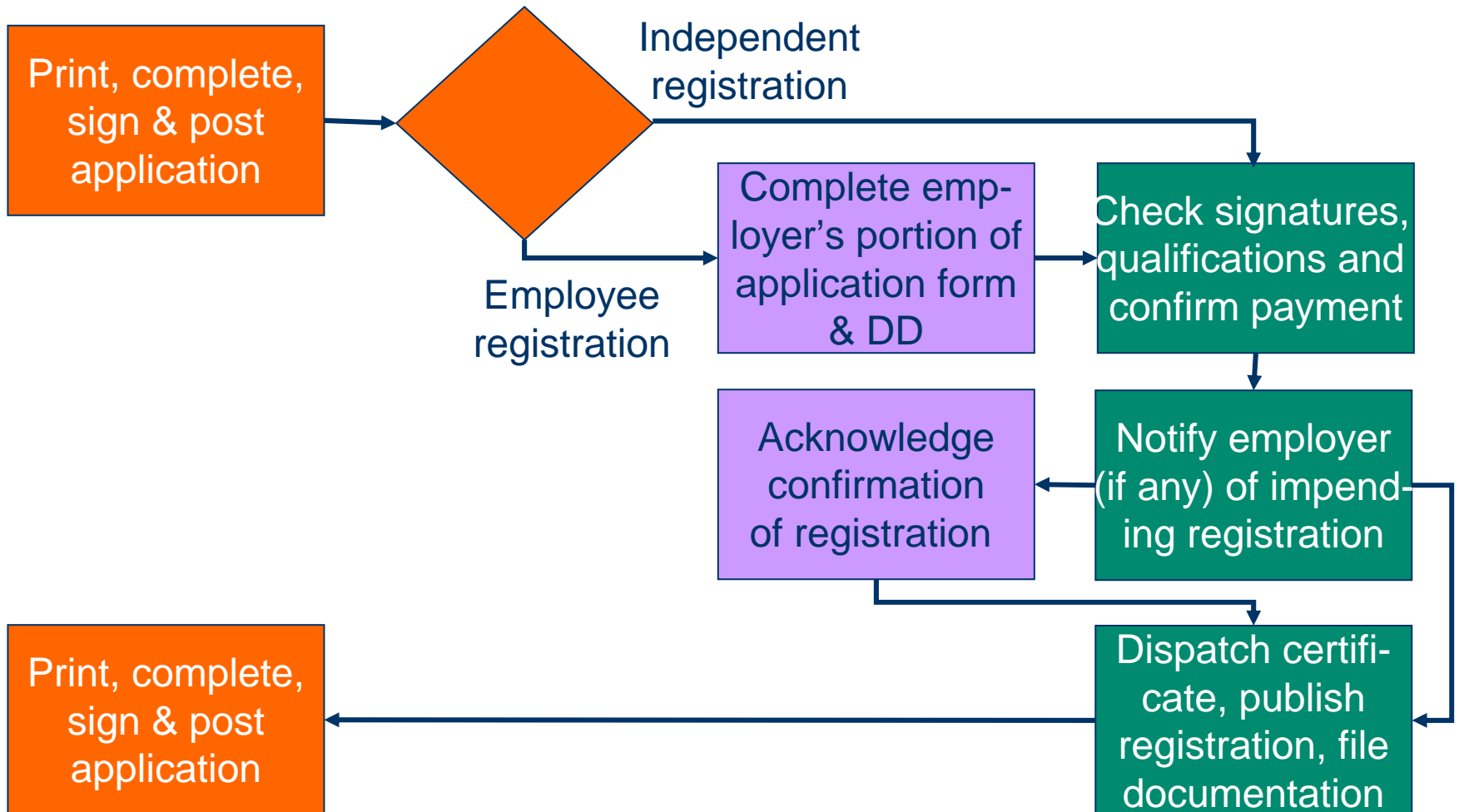
**Registration information will be posted on [www.sei.ie/epbd](http://www.sei.ie/epbd)**

# Registration Process

BER Assessor

Employer/ Principal

SEI



# Other BER Issues

- Registration and renewal
- Resignation, lapsing, suspension and termination
- Role of employer
- Registration of assessments
- Payment of registration fees and charges
- Insurance
- Appeals and complaints
- Recruitment of BER Assessors
- Offences

# BER Assessor's Web Site 1



- Legislation
- Code of conduct
- BER Assessor's FAQ
- SEI fees & levies
  - Billing & payment system
  - Schedule of charges
- BER Ratings
  - How to log a rating
  - Register of BER certificates
- Register of BER Assessors
- BER Assessor registration
  - Application form
  - Employer's support form
- BER Assessor management issues
  - Employment matters
  - Model contract
  - Record keeping
  - Insurance

# BER Assessor's Web Site 2



- Appeals and complaints
- BER Assessor training
  - Eligibility
  - Courses
  - Insurance
  - Employment matters
- Quality Assurance
- DEAP
- HARP



# Non-BER Provisions

# Alternative Energy Systems (AES)



AES assessment applies to:  
new buildings >1,000m<sup>2</sup>  
e.g. large apartment blocks

From **January 2007**

National Study – publication  
**March 2007**

Software Tool – “**PASSES**”  
**being finalised**

*\*Planning Assessment Software for Sustainable Energy Systems*

# Boilers & A/C Systems

## Boilers & Heating Systems

- Advice Option
- Boilers Database (HARP) (November 06)
- Informational and promotional campaign for energy efficiency of boilers and heating systems (January 08)

## Inspection of large air-conditioning systems

- Regulations adopted June 06
- Mandatory from January 08
- Inspection procedures to be developed

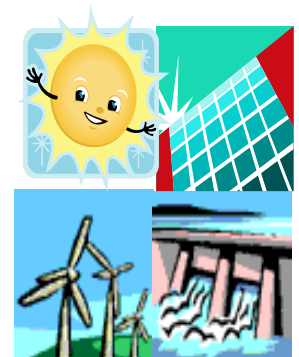
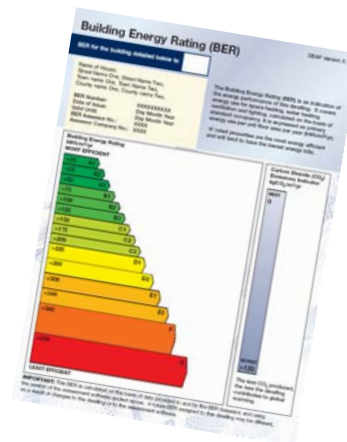


# Implications for Building Control

# Responsibilities/ Implications for Building Control and SEI

## Energy Performance of Buildings Regulations (SI No. 666 of 2006):

- Building Energy Rating
- Alternative Energy Systems assessment



# SI 666 of 2006: Citations of Building Control Authorities

- “**building control authority**” has the meaning assigned to it by Section 3 of the Building Control Act 1990 (No. 3 of 1990)
- “authorised officer” may mean either an authorised officer of a **building control authority** or a person authorised by the issuing authority;
- The results of the consideration of the feasibility of alternative energy systems required under this Regulation shall be incorporated in a report on the design of the relevant large building and shall be retained by the person who commissioned that building for a period of 5 years from the date of completion of the building and shall be produced, on demand, to the **building control authority** ....
- Proceedings for an offence under this Part may be brought and prosecuted by the **building control authority** ....

# SI 666 of 2006: Citations of Building Control Authorities

- **A person who commissions the construction of a building** of a class referred to in .....shall, before such building is occupied for the first time, secure a BER certificate ..... and advisory report in relation to the building and shall produce a **printed copy of such BER certificate and advisory report to the building control authority** in whose functional area the building is situated, on demand being made by that authority ....
- **A person who offers for sale or letting** ...(a building.)and any agent acting on behalf of such person in connection with such offering, shall produce a **printed copy of the BER certificate and advisory report** in relation to the building to any person expressing an interest in purchasing or taking a letting of the building and, on demand, **to the building control authority** ....

# SI 666 of 2006: Citations of Building Control Authorities

- where the building is being **offered for sale or letting .... on the basis of the plans and specifications** for its proposed construction, a printed copy of the provisional BER certificate .... based on these plans and specifications in relation to the proposed building, and related advisory report, shall be produced to any of the persons (expressing interest....)
- **on the completion of construction** of the building .... a **printed copy of the BER certificate .... and of the related advisory report** in relation to the completed building, which take account of any changes ....., shall be produced to any purchaser or tenant, before completion of such sale or letting and, on demand, **to the building control authority .....**

# SI 666 of 2006: Citations of Building Control Authorities

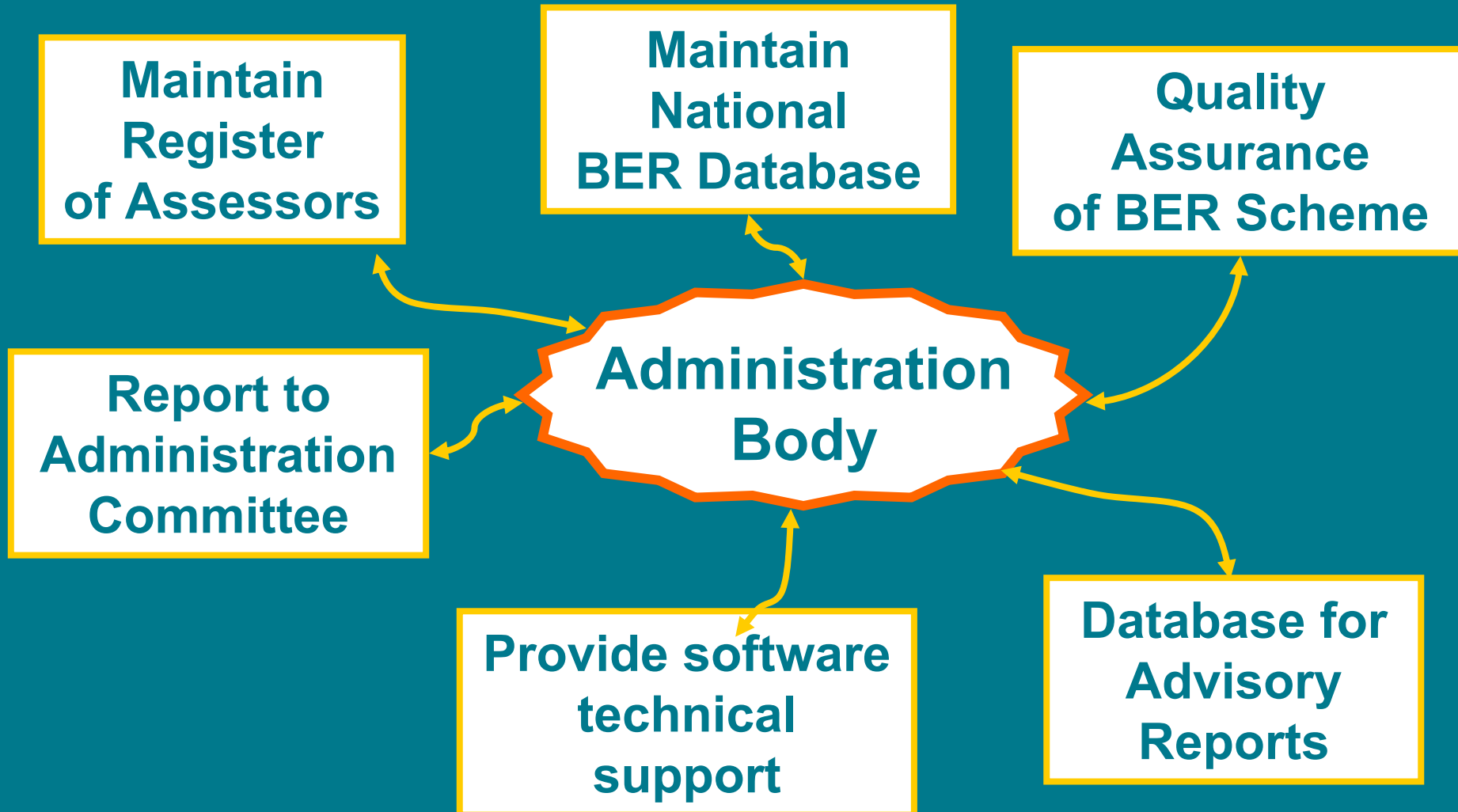
- A building control authority or an authorised officer thereof **may demand**, from the owner of a building, or the agent of such owner ..... the production of **a printed copy** of the BER certificate
- Where a person produces a printed copy of the BER certificate to an authorised officer of the building control authority but refuses or fails to permit the said officer to read and examine it, that person commits an offence and the authorised officer may demand of the person his or her name and address.
- **Proceedings** for such an offence **may be brought and prosecuted by the building control authority ....**
- **Proceedings** for an offence under these Regulations may be brought and prosecuted by the building control authority or the issuing authority ....

# SI 666 of 2006: Powers and functions of SEI



- Named as “issuing authority” – extensive functions
- Alternative Energy Systems: publish study, approve software...
- Administration of BER system:
  - Registration of BER assessors
  - Directions to BER assessors
  - Charging of levies
  - Specification and handling of BER data files, certificates etc.
  - Revocation of BER data files or certificates
  - Ownership and maintenance of records, data, documentation
  - Establishment, operation and maintenance of registers
- Evidential value in court proceedings
- Appointment and powers of authorised officers

# Administration Scheme



# AWARENESS RAISING

- Queries Database: 3,300 names
- e-EPBD e-updates
- Marketing Plan
- Participation/Organisation of Information Events

## Summary of EPBD Events

Year	Number of Events	Attendance
2004	12	836
2005	46	2242
2006	45	5605
2007	16	3089
<b>Total</b>	<b>103</b>	<b>8683</b>

# EPBD Impacts on Buildings

## New Buildings (residential, commercial or public)

- Compliance with Building Regulations
- BER & AR - most likely off plans
- AES Feasibility (>1,000m<sup>2</sup>)

Design/  
asset rating ?

## Existing Buildings Transacted (residential or commercial)

- No minimum energy performance standards
- BER & AR - most likely survey based
- BER & AR for information only

Asset  
rating ?

## Existing Buildings, Non-transacted (large public buildings)

- Display BER

Asset / operational  
rating ?

# Market Impacts

- Energy rating as marketing tool: market edge
- Impact on building design
- Demand for higher spec buildings
- Potential impact on property values?
- Impact on building upgrading
- New market for energy efficient services and products
- Cost of energy ratings & other services
- Potential impact on property transaction times
- Momentum for renewable energy



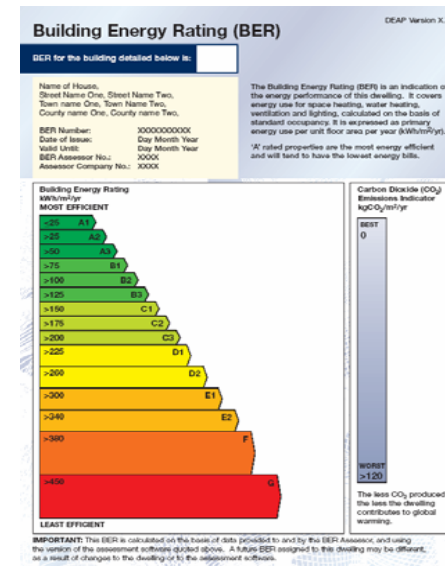
# Conclusions

# Key EPBD Goals for 2007

- Release DEAP Software
- Finalise and promote PASSES software
- Establish administration system – contingency >> full
- Train and register more BER assessors
- Establish methodology for non-residential buildings
- Develop inspection system for air conditioning
- Prepare initiatives on boilers/heating systems
- Awareness campaigning

# Conclusions

- Making energy performance of buildings visible to consumers/ investors/ decision makers
- Stimulating:
  - Higher spec standards in new homes
  - Investment in upgrading of existing homes
- New demand for energy assessors, energy efficient materials, products and services
- Impact on property prices?
- *Significant lever to improve the energy, environmental & economic performance of Irish Homes*



# Further Information

- [www.sei.ie/epbd](http://www.sei.ie/epbd)
- [www.kyotobuildings.net](http://www.kyotobuildings.net)
- [www.diag.co.uk](http://www.diag.co.uk)
- [www.enper.org](http://www.enper.org)
- [www.europrosper.org](http://www.europrosper.org)



Promoting and assisting the development of sustainable energy



- Your Business
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You are here » Home » Your Building » Energy Performance of Buildings Directive (EPBD)

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- » Public Sector Buildings
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  - » Key Documents
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  - » Development of Energy Performance Standards
  - » Related projects - EU funded
  - » Implementation in other EU countries
  - » FAQ
- » Low Income Housing



## Energy Performance of Buildings Directive (EPBD)

The **EU Directive on the Energy Performance of Buildings (EPBD)** contains a range of provisions aimed at improving energy performance in residential and non-residential buildings, both newbuild and existing.

The EPBD obliges specific forms of information and advice on energy to be provided to building purchasers, tenants and users. The intention is that this **information and advice will help consumers to make informed decisions leading to practical actions to improve energy performance.**

As part of the Directive, a Building Energy Rating (BER) certificate, which is effectively an **energy label, will be required at the point of sale or rental of a building, or on completion of a new building.** The BER will be accompanied by an "Advisory Report" setting out recommendations for cost-effective improvements to the energy performance of the building. However there will be no legal obligation on vendors or prospective purchasers to carry out the recommended improvements.

**In Ireland, this directive is expected to impact on over 150,000 sale or rental transactions per year in the residential market.** The Directive must be transposed into national law and must be generally brought into operation by EU Member States by 4th January 2006. **However, provision is made to allow a longer period, ending in January 2009, for full implementation of the more complex requirements** relating to





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