What the L?

The New Irish Building Regulations Part L:

The Impact on City Centre Developments

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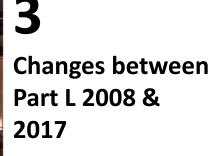
ENERGY CORK COMMUNITY BREAKFAST BRIEFING 26TH OCT 2017

The New Irish Building Regulations Part L:

Overview

Introduction to new regulations





Example building

5 Conclusions

Introduction



EPBD defines NZEB as "...a building that has a very high energy performance, as determined in accordance with Annex I. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby".

New Regulations

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Interim NZEB Performance Specification for new buildings owned and occupied by Public Authorities

Introduction

The following is sets out a performance specification for new buildings owned and occupied by Public Authorities after 31st Dec 2018. It is intended that this specification will form the Nearty Zero Energy Buildings requirement in the interim period until the new 2017 Part L for Buildings other than Dwellings takes effect.

The definition of Nearly Zero Energy Buildings as defined in Directive 2010/31/EU on the energy performance of buildings (recast) as:

"hearly zero-energy building' means a building that has a very high energy performance, as determined in accordance with Annex I. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby."

Application

Public Authorities should use this performance specification in the design of all new buildings from the 1st January 2017. It is intended that applying this standard from this date will enable all new buildings owned and occupied by Public Authorities after the 31st Dec 2018 to be Nearly Zero Energy Buildings. The application of the performance parameters specified in Table 1 will achieve a performance that is in the order of 50% to 60% better than current requirements.

This specification and any updates will be available to download from the SEAI website. Any supporting guidelines or support tools for this specification will be made available there.

Energy from Renewable Sources

The definition of "nearly zero energy building" requires that "the nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby;"

In order to achieve this, a target of 20% Renewables Energy Ratio (RER) has been set as the NZEB energy from renewable sources onsite or nearby target. The draft software tool provided by SEAI will be provided to support the calculation of the RER.

It is recognised that in certain confined situations it may not be possible to achieve the full 20% RER. In these situations Public Sector Authorities should provide the optimum proportion of energy from renewable energy sources that is practically possible.

In all cases the overall energy performance of the building should be equivalent to the performance of the building as if the 20% RER had been achieved.

Overheating

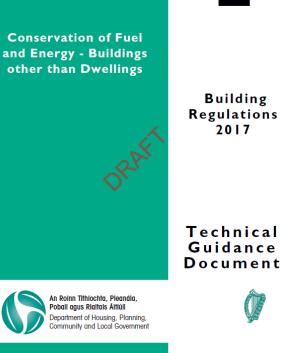
Public Authorities should work with their design teams to define a satisfactory criteria for the internal environment and carry out the necessary assessments to ensure

Department of Housing, Planning, Community and Local Government Date: 22-12-2016 Rev. 0

Issued 23rd Dec 2016,

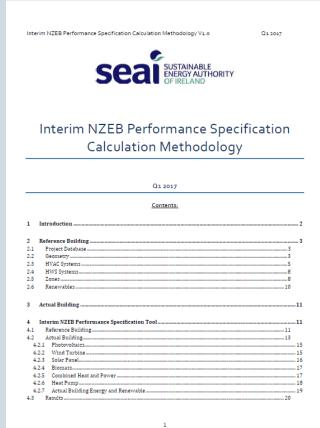
- To be used from 1st
 Jan 2017
 - Applicable until Part

L 2017 applies



- Draft regulations currently under review
- Applicable to works that take place on or after 1st Jan 2019
- Transitional agreement: allows the use of Part L 2008 for projects where planning approval has been applied for on or before **31**st **December 2018** and substantial work has been completed by **1**st
 January 2020

Supporting Documentation

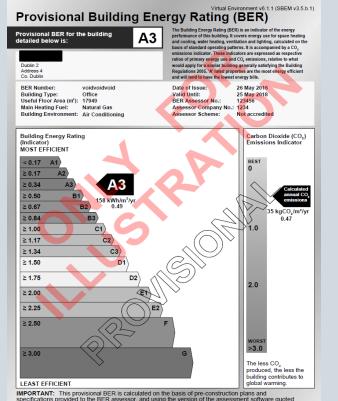


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Publication Date: Q1 2017						I INCLAIND		
1. General information								
Public Body: Building Address:								
7 2. Assessor Details								
Assessor Name:								
Assessor Number: 0								
3. Reference Building Data								
1	Actual Energy Use:	Guidance	Note: Fuel:	Primary Energy:	CO2 Emissions:			
Heating Energy	25.3096							
3 Cooling Energy	20.0171		Mains Gas	27.84	5.14			
4 Auxiliary Energy	11.5074	kWh/m2/yr the actua	energy use Electricity	43.84	9.47			
5 Lighting Energy	45.4944	kWh/m2/yr created	manually Reference	25.20	5.44			
6		kWh/m2/yr Bu	Iding Electricity	99.63	21.52			
Hot Water Energy 7	4.22082	kWh/m2/yr	Mains Gas	4.64	0.86			
		Referen	ce Building without Renewable					

BER

No changes to BER rating procedure





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 building on completion may be different, in the event of changes to those plans or specifications, or to the assessment software.

Part L 2017

1. EPC & CPC

2. Renewable contribution

Simulation Procedure

Reference Building

Actual Building Building





Simulation Procedure

 $EPC = \frac{Primary \, Energy_{Actual \ Building}}{Primary \, Energy_{Reference \ Building}}$

 $CPC = \frac{CO_2 \ Emmissions_{Actual \ Building}}{CO_2 \ Emmissions_{Reference \ Building}}$

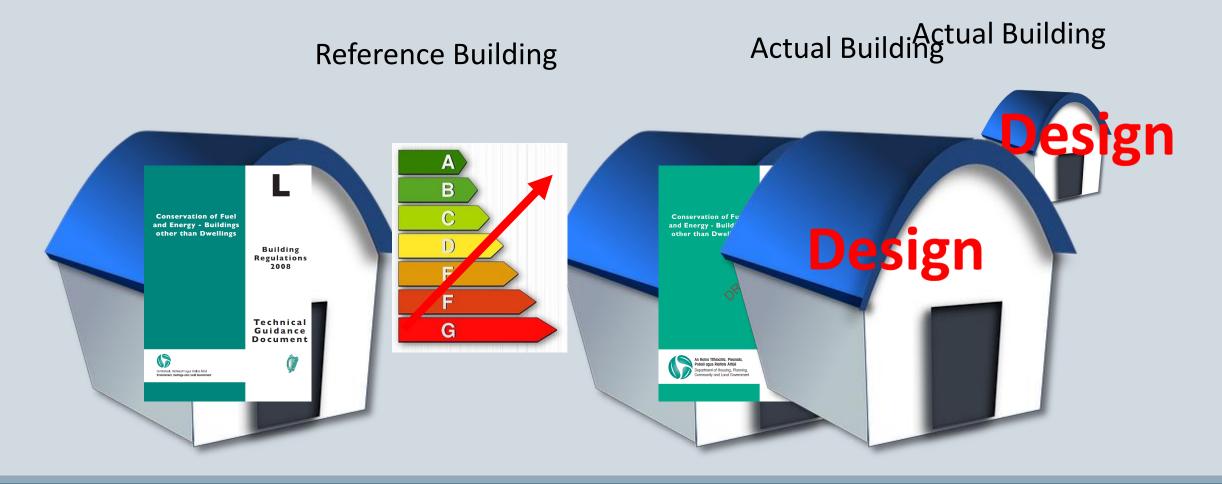


EPC and CPC defines level of renewables

New Requirements

Energy Performance Coefficient (EPC)	For compliance EPC 1.0	Renewables EPC > 0.9 & CPC > 1.04 20%
Carbon Performance Coefficient (CPC)	CPC 1.15	EPC = 0.9 & CPC </= 1.04 <b 10%

Changes from Part L 2008

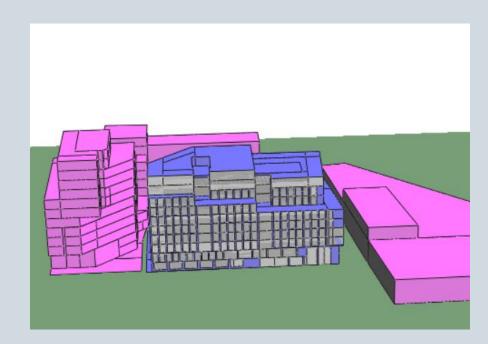


Reference Building

Table 1 Interim Reference Building Specification for Public Authority Non-residential Buildings Heating efficiency (heating and 91 91 91 91 91 91 91 91 91 91 91 91 91									
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Example Office Building

- 16,000m²
- Dublin city centre
- Owned and occupied by public authority
- Meets and exceeds Part L 2008
- BER A3 Rating
- Mechanical and Lighting systems:
 - 4-pipe Fan-coil-unit system
 - Gas fired boilers
 - Water cooled chillers
 - Low SFP
 - AHU Heat Recovery
 - Low lighting power density



EPC & CPC

	Part L - 2008	Part L - 2017		
EPC	0.36	0.82	<1.0	<0.9
СРС	0.36	0.83	<1.15	<1.04

No changes required to meet EPC & CPC



Next Step

1. EPC & CPC

2. Renewable contribution



Renewable Energy Ratio (RER)

- Photovoltaic
- Solar Panel Thermal
- Wind Energy
- CHP
- Biogas CHP
- Biomass Boiler
- Heat Pumps

Photovoltaic

PV Array Type	PV Area [m²]	PV Efficiency	Primary Energy [kWh/ m²/ year]	RER	Meets RER 20%?	Meets RER 10%?
Monochrystalline Silicone	3,200	15%	12.94	21%	Yes	Yes
Monochrystalline Silicone	1,600	15%	6.47	10%	No	Yes
Polychrystalline Silicone	4,000	12%	12.94	21%	Yes	Yes
Amorphous Silicone	4,000	6%	6.47	11%	No	Yes
Other thin films	4,000	8%	8.63	14%	No	Yes



Solar Thermal

- 2% RER
- Small hot water load



Wind Energy

Assumptions:

- 30m hub height
- 60kW rated power
- 22m horizontal axis
- 4% RER (large scale)

Feasibility:

- Only roof mounted feasible
- Hard to integrate to city centre developments



CHP

- Full heating & hot water load 8% RER
- Constant load only provided by hot water
- Hot water load 1% RER



Biogas CHP

- 38% RER
- Storage and delivery issues for city centre locations



Biomass Boiler

- 18% RER
- Issues around frequent delivery and large storage areas
- Air quality issues with the use of wood pellets

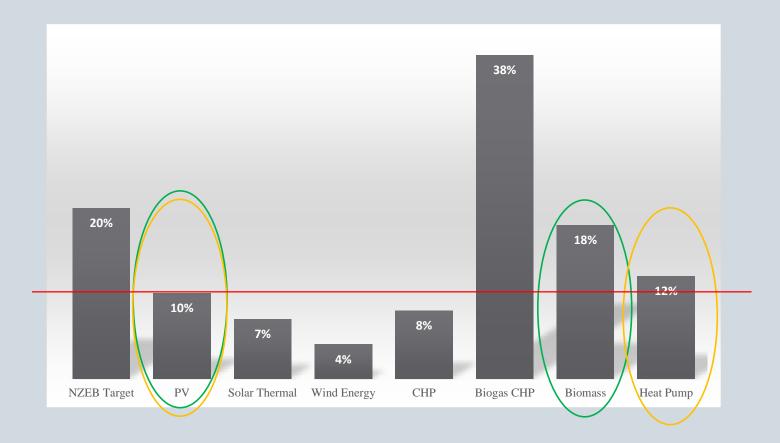


Heat Pumps

- 12% RER
- Most feasible option for city centre location
- Low design temperatures
- Poor performance low external temperatures
- Use of refrigerant



Renewable Energy Ratio Results



Public Consultation

- No embodied energy
- Primary energy factor based on 2015 data
- SBEM not suited for complex buildings, call for dynamic simulation
- 10% option might not be acceptable under EPBD



- Concerns of oversizing CHPs, PV overshadowing
- No maintenance requirements

Conclusions

- EPC and CPC can be met with a building designed to BER A3
- Renewable Energy Contribution will be challenging for city centre projects
- Push for high efficiency buildings to reduce renewable energy requirements
- The typical Dublin office solution not viable

Arup Cork onealbertquay | WELL Features

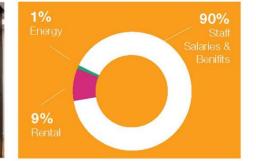
Thank you

Q&A

Health And Wellbeing Consultancy at Arup Click here







WELL identifies 100 performance metrics, design strategies, and policies that can be implemented in buildings.



WELL is based on a thorough review of the existing research into the effects of spaces on individuals.



WELL is the first standard of its kind that focuses solely on the health and wellbeing (H&WB) of building occupants.

" – Designing and operating facilities for the betterment of the occupants

