An Roinn Tithíochta,
Pleanála agus Rialtais Áitiúil
Department of Housing,
Planning and Local Government

Regulatory Impact Analysis (RIA)

Proposed amendments to Part L and Part F of the Building Regulations and Technical Guidance Document L& F

Part L& F of the Building Regulations Part L (Conservation of Fuel and Energy) Dwellings and Part F (Ventilation)

Date 06 April 2018

1. General Introduction

This Regulatory Impact Assessment (RIA) is concerned with proposals to amend the requirements of Part F (Ventilation) and Part L (Conservation of Fuel and Energy) of the Second Schedule to the Building Regulations applicable dwellings, in order to meet the requirements of Directive 2010/31/EU of the European Parliament and of the Council on the energy performance of buildings (Recast)(the "Directive"). It sets requirements at an EU level for Member States to improve the energy performance of buildings and to make an important contribution to the reduction of greenhouse gas emissions.

Article 9(1) of the Directive requires Member States to ensure that:-

- by 31 December 2020, all new buildings are nearly zero-energy buildings; and
- after 31 December 2018, new buildings occupied and owned by public authorities[1] are nearly zero-energy buildings.

The Directive defines a Nearly Zero Energy Building (NZEB) as a building that has a very high energy performance and 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. This definition was incorporated in the Building Regulations 1997 – 2017 last year by way of Statutory Instrument (S.I. No. 4 of 2017 Building Regulations (Amendment) Regulations) and a numerical indicator for nearly zero energy dwellings was inserted in the amended TGD L Dwellings (2011).

When implemented – these new regulations will improve the energy performance of new dwellings by 70% over 2005 building regulations provisions. This will equate to a typical new dwelling having a Building Energy Rating (BER) of A2.

Currently 94% of all new dwellings are built to an A3 standard based on BER data as analysed by the Central Statistics Office.

[1] New social housing is not subject to the 31st Dec 2018 date as it is not occupied by public authorities

The Second Schedule of the Building Regulations 1997-2017 sets out the statutory minimum building standards and performance requirements that must be achieved by a new building when it is constructed. The Schedule is comprised of twelve distinct parts, classified A to M, which are primarily designed to ensure the safety and wellbeing of people in and around buildings. A Technical Guidance Document is published to accompany each of the various parts and it sets out how the legal requirements of each individual part can be achieved in practice.

The requirements of Parts A to M, and the associated technical guidance documents, are reviewed periodically by the Building Standards Section of the Department in light of evolving issues relating to the built environment and in response to developments and trends within the construction industry. The aim of Building Standards Section is to develop and promote a strong and evolving building code in support of quality construction and sustainable development.

The purpose of this RIA is to consider in detail the impacts, costs and benefits of the proposed changes to Part L (Conservation of Fuel and Energy) & Part F (Ventilation) for dwellings. This RIA, together with draft copies of the proposed Part L & F amendment regulations and accompanying Technical Guidance Documents L & F, will form the basis for a comprehensive two month public consultation process. It is intended that this process, taking due account of submissions received, will enable the Department to recommend a final set of amended regulations to the Minister for Housing, Planning, & Local Government for signature in Q.2 of 2018.

2. Part F and Part L –Dwellings: Current Context

2.1 Current programme of change

Part L (Conservation of Fuel and Energy) of the Building Regulations sets out the statutory minimum standards of energy efficiency and carbon dioxide emissions that apply to a newly constructed building, a new extension to an existing building or an existing building undergoing a material alteration or a material change of use. Technical Guidance Document (TGD L) sets out how owners, builders, developers

and designers can achieve compliance with Part L requirements in practice. Since 2008 separate volumes of TGD L have been published in respect of Dwellings and Buildings Other than Dwellings.

Part F (Ventilation) of the Building Regulations sets out minimum standards to provide effective and adequate means of ventilation in buildings. In the context of greater energy efficiency and increased air tightness – adequate ventilation is paramount to ensure good indoor air quality

The European Commission published a communication in July 2016, Commission Recommendation EU 2016/1318 on guidelines for the promotion of nearly zero-energy buildings and best practices to ensure that after 2018 all new buildings owned and occupied by public authorities are nearly zero and that by 2020 all new buildings are nearly zero.

The Recommendation provided that "*experience from the construction sector shows that the timing of the end of construction or completion of a building might be uncertain and may suffer delays. Member States would need to factor in the period of validity of building permits, the length of construction and completion of building works and the targets in Article 9(1) of the EPBD to avoid falling short of the obligation to ensure that 'by January 2021 all new buildings are NZEBs*" and in this regard the Department proposes to have a consultation period of two months in order to finalise the Regulations and TGD's by July of 2018 to allow sufficient time to ensure compliance with the Directive.

The Department is responsible for making necessary amendments to the Building Regulations to ensure that they are in compliance with the Directive. The proposed Part L & F Amendment Regulations and Technical Guidance Documents, which have been published in tandem with this Regulatory Impact Analysis, set the specific NZEB performance requirements for Dwellings in Ireland.

The Directive formally requires Member States to set minimum energy performance requirements for buildings and building elements at cost-optimal levels. Cost-optimal

calculations must be carried out by Member States at least once every five years and calculated in accordance with the comparative methodology framework[2] published by the Commission in March 2012. The performance should be set with a view to achieving the cost-optimal balance between the investments involved and the energy costs saved throughout the lifecycle of the building and should be reviewed and updated to reflect technical progress at intervals not exceeding 5 years. Ireland's report on the development of cost optimal calculations and gap analysis for dwellings was published on the Department's website in March 2013.

Finally, the Directive requires that where major renovations are being carried out to a building, which is defined as where the surface area of the works being carried out is greater than 25% of the surface area of the building envelope, the building should achieve a cost optimal energy performance at building level in so far as this is technically, functionally and economically feasible.

2.2 EU and International Commitments

Ireland has responded positively to the global challenges of climate change and energy sustainability. Ireland's Transition to a Low Carbon Energy Future 2015 - 2030 whitepaper was published in December 2015 and takes into account European and International climate change targets including those agreed at COP 21, the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) took place in Paris from 30th November to 11th December 2015. Ireland's mitigation target will be part of the pledged EU target of at least 40% reduction in domestic greenhouse gas emissions by 2030 compared to 1990. This EU headline was agreed by the European Council in October 2014. Ireland will have to reduce its emissions by 30%, relative to its 2005 emissions in order to make a technically feasible, cost-effective and equitable contribution to this overall EU target.

The Climate Action and Low Carbon Development Act 2015 sets out the national objective of transitioning to a low carbon, climate resilient and environmentally sustainable economy in the period up to 2050. It requires the publication of National

[2] Delegated Regulation No. 244/2012

low carbon transition and mitigation plan every five years and the Department is required to identify and develop sectoral mitigation measures for the built environment. In this regard implementation of the EU NZEB requirements will be identified as a built environment measure that will contribute to the Ireland's greenhouse gas emission reduction targets.

National Energy Efficiency Action Plan 2014 (NEEAP 3)

Ireland's third National Energy Efficiency Action Plan (NEEAP) 2014 reaffirmed Ireland's commitment to delivering a 20% reduction in energy demand across the whole of the economy by 2020, along with a 33% reduction in public sector energy use. It also outlines specific measures to be pursued in the key sectors of the economy, including the transport, commercial, public, residential and energy services sectors.

2.3 Residential Emissions in Ireland – Current Position

The primary source of information on national energy use is the Sustainable Energy Authority of Ireland's (SEAI) report on *Energy in Ireland 1990 - 2016* (2017). The following information is particularly relevant: -

- Final energy consumption[3] in the residential sector grew by 19.7% between 1990 and 2016[4].
- The overall residential sector's share of total energy usage fell by 8% from 1990 to 2015.[5]
- In 2016 the average dwelling emitted 5.5 t of energy-related CO_2 .[6]
- With regard to CO_2 emissions the overall residential sector energy-related CO2 emissions increased by 1.6% in 2016 to 9,690 kt CO_2.[7]

[3] Final energy consumption refers only to the energy consumed directly by the end user and does not include the energy used to convert primary sources of energy into forms that can be used by a consumer.
[4] Page 18, SEAI Energy in Ireland 1990 – 2016 Report (2017)
[5] Page 18, SEAI Energy in Ireland 1990 – 2016 Report (2017)
[6] Page 68, SEAI Energy in Ireland 1990 – 2016 Report (2017)
[7] Page 66, SEAI Energy in Ireland 1990 – 2016 Report (2017)

Energy use and CO_2 emissions associated with the residential sector continue to be significant and measures to reduce their impact in both new and existing buildings will continue to be an important component of Government energy and climate change policies.

3. Purpose and Objectives

The aim of the proposal to upgrade Parts F & L of the Building Regulations is to raise energy performance standards in order to reduce both residential energy demand and CO_2 emissions and to ensure adequate and effective ventilation standards.

The 2016 Programme for a Partnership Government specifically commits to Ireland's transition to a low carbon society by 2050 and energy and CO_2 emissions savings likely to accrue as a consequence of the proposals have already been factored into the third *National Energy Efficiency Action Plan 2014.* This was factored into the built environment carbon sectoral plan which fed into the National Mitigation Plan, published by the Minister for Communications, Climate Action and Environment, in accordance with the Climate Action and Low Carbon Development Act 2015, in July 2017.

Furthermore the proposal to amend Parts L and F of the Building Regulations is necessitated by the mandatory requirements of the Energy Performance of Buildings Directive in respect of NZEB and major renovations.

4. Options

Two options have been identified: -

- **Option 1** - Do nothing

- **Option 2** – Adopt mandatory measures contained in the Directive

(A) Option 1 – Do nothing

Whilst there would be no additional costs associated with this option, there would be no benefits either. In addition, failing to address the impacts of the built environment on national and international climate change obligations would significantly undermine Government targets aimed at increasing energy efficiency and reducing CO_2 emissions. This would have adverse implications for sustainable development and would inevitably lead to necessary consideration by Government of alternative interventions to make up the resultant shortfall against existing commitments.

Moreover, the recast Energy Performance of Buildings Directive requires member states to introduce requirements to ensure that:-

- All new buildings are nearly zero energy buildings by 31 December 2020;
- All new buildings occupied and owned by public authorities are nearly zero-energy buildings after 31 December 2018; and
- where a building undergoes a major renovation it should achieve a cost optimal energy performance at building level in so far as this is technically, functionally and economically feasible.

The Directive does not permit member states discretion to derogate from these measures in their national building regulations and therefore this is not considered a viable option.

(B) Option 2 – Adopt appropriate mandatory measures in contained in the Directive

Given that Option 1 has the potential to leave Ireland exposed to an infringement action by the European Commission, Option 2 is the preferred option as it is the most effective method of transposing the requirements of the Directive and delivering on our commitments to reduce domestic primary energy consumption and CO_2 emissions as set out in international agreements.

The amended Building Regulations – Part L and associated TGD L – will stipulate that new dwellings can achieve the new standards by making provision for: -

- A 70% improvement in energy efficiency for new dwellings (relative to 2005 base year standards).
- A 70% reduction in CO_2 emissions (again relative to the 2005 base year standards).
- Reducing air permeability backstop value.
- Providing for 20% renewables as a percentage of total building energy use.
- Improvement of energy performance of the building to cost optimal level where an existing dwelling undergoes a major renovation.

5. Public Consultation

The proposed amendments to Parts F & L which are required by the Energy Performance of Buildings Directive have been preceded by a comprehensive inter agency consultation process involving close contact between the Department of Housing, Planning, and Local Government, the Department of Communications, Climate Action and Environment and the Sustainable Energy Authority of Ireland (SEAI).

A stakeholder meeting was hosted in the Custom House on 20 March 2018 with members of the Construction Industry Council which consists of representatives from the following professional and industry bodies:-

- The Building Materials Federation
- Association of Consulting Engineers in Ireland
- The Construction Industry Federation
- Engineers Ireland
- The Royal Institute of the Architects of Ireland
- The Society of Chartered Surveyors Ireland
- Irish Green Building Council
- National Standards Authority of Ireland
- Chartered Institute of Building
- Residential Ventilation Association

At this meeting a high level presentation of the proposed changes to the reference building, the overall energy performance required, illustrative building element performances, the renewable energy ratio and major renovations requirements was delivered to the group.

Cognisance has been taken of feedback received from industry in response to previous consultations in relation to Part L and experience has been gained in

relation to the mandatory requirement for renewables which has applied in respect of dwellings since 2007. A list of the supports which have been put in place as result of consultation in relation to previous TGD L amendments are as follows: -

- DEHLG *"Limiting Thermal Bridging and Air Infiltration – Acceptable Construction Details"*
- NSAI's Air tightness Testers Scheme
- NSAI's Windows Energy Performance Scheme
- NSAI's draft *SR 50-2:2012 Code of practice for building services* - Part 2: Thermal solar panel guidelines

6. Who will be affected by the proposed amendments to Parts L and F required by the EPBD?

The following stakeholders will be directly affected by the proposed Part L requirements: -

- Home owners, occupiers and landlords
- Building Professionals
- Assigned Certifiers
- Developers and Builders
- Public Sector
- Construction product/systems manufacturers
- Industry Suppliers
- Renewable energy system producers
- Building Control Authorities
- Education Bodies
- Training Bodies

Compliance with the EPBD improves people's lives, brings comfort and convenience and addresses environmental challenges. It is also beneficial to our economy, creating and protecting jobs. It will mitigate against energy poverty and ill health as well as providing for fuel security and lower carbon emissions. Improvements in indoor air quality as a result of more effective ventilation benefit those with acute respiratory conditions such as asthma.

While the proposed Parts L and F requirements substantially improve the energy performance requirements for dwellings, designers, developers, builders and consumers have been left considerable discretion in choosing their own individual approach to achieving the overall standard required for compliance. In this way, no individual technology or system should or will be either favoured or disadvantaged. This will incentivise suppliers of building elements and components which have a significant impact on energy performance to innovate and adapt their existing products or develop new ones as the amended Part L /TGD L requirements should fully recognise the contribution of such products to reducing energy demand and CO_2 emissions.

For homeowners who wish to move away from using fossil fuels there will be new grants for heat pumps from April 2018 under the Better Energy Homes Scheme. Grants are also available for insulation and solar thermal systems. The Better Energy Warmer Homes Scheme funds energy efficiency improvements to the homes of vulnerable people in or at risk of energy poverty. This has recently been extended to families in receipt of the Domiciliary Care Allowance (DCA).

The amended Part L /TGD L requirements should also contribute to achieving national CO_2 emissions reduction targets and thus help address Ireland's international CO_2 commitments.

7. Achieving Compliance in Practice

In 2013 Cost Optimal calculations[8] were submitted to the EU Commission in accordance with Directive 2010/31/EU for 5 building types described in Table 1.

Table 1 Building Models

Building Category	Building Type	Floor Area
Single Family Buildings	Semi-Detached House	126 m^2
	Detached House	160 m^2
	Bungalow	104 m^2
Apartment Block	Mid-Floor Flat	80 m^2
	Top-Floor Flat	80 m^2

These calculations identified that there was potential to improve the energy performance of new dwellings in the order of 70% over 2005 building regulations. This will equate to a typical dwelling having a BER of A2.

A performance specification has been developed in Appendix E of the draft Technical Guidance Document (L) which represents an improvement in performance of 70% across all new dwellings. In addition a requirement of 20% renewables is included in this performance specification to meet the EPBD definition of Nearly Zero Energy Buildings. Where new dwellings meet the energy and carbon dioxide emissions performance requirement in DEAP achieved by a reference building with the same shape and floor area , the actual building will have achieved an energy performance which can be described as meeting Ireland's definition of Nearly Zero Energy Buildings.

The requirement for Renewables of 20% has been introduced based on the NZEB requirement 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 and the Commission Recommendation (EU) 2016/1318 of 29 July 2016 on guidelines for the promotion of

[8] http://www.housing.gov.ie/housing/building-standards/energy-performance-buildings/report-development-cost-optimal-calculations

nearly zero energy buildings and best practices to ensure that, by 2020, all new buildings are nearly zero energy buildings. [9]

The calculation methodology for assessing the energy and carbon dioxide emissions performance and renewables requirements for compliance with Part L of the building regulations is DEAP. There will be a new version of DEAP issued alongside this revision of Part L. The list of changes planned to be implemented in DEAP are published by SEAI in an Annex to this Part L public consultation. As the revision of DEAP will need to take account of Public Consultation comments in relation to Part L and F it is proposed that new version of DEAP will be available to industry by September 2018.

A study has been carried out assessing the improvement in energy and carbon dioxide emissions performance for dwellings in table 2 below. The energy and carbon dioxide emissions performance requirement to the current building regulations are also provided for information purposes.

[9] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016H1318&from=EN

Table 2 Full set of options to achieve 70% improvement

	Heating and Ventilation	PV (kWp)	PV (m^2) 1kWp= 7.5m^2	PV (% of roof area)	Solar thermal (m^2)	Solar fraction (%)	Energy Performance Coefficient	Carbon Performance Coefficient	Primary energy (kWh/yr/m²)	CO_2 emissions (kg/yr/m²)	Building Energy Rating	Delivered renewable energy (kWh/yr/m^2)	RER
Semi Detached	Gas Boiler NV[1]	1.15	8.6	7%	n/a	n/a	0.30	0.28	43.4	8.1	A2	12.55	0.22
	Gas Boiler MVHR + AP of 3	0.85	6.4	5%	n/a	n/a	0.26	0.24	37.9	7.0	A2	9.28	0.20
	Heat Pump NV[1]	0	0	0%	n/a	n/a	0.25	0.21	36.5	6.1	A2	26.24	0.42
	Heat Pump MVHR + AP of 3	0	0	0%	n/a	n/a	0.25	0.20	35.9	6.0	A2	17.85	0.33
Detached	Gas Boiler NV[1]	1.45	10.9	7%	n/a	n/a	0.30	0.28	44.3	8.3	A2	12.46	0.22
	Gas Boiler MVHR + AP of 3	1.1	8.3	5%	n/a	n/a	0.26	0.23	37.7	6.9	A2	9.45	0.20
	Gas Boiler MVHR + AP of 3	n/a	n/a	n/a	8	60%	0.25	0.22	36.7	6.6	A2	9.09	0.20
	Heat Pump NV[1]	0	0	0%	n/a	n/a	0.24	0.20	35.4	5.9	A2	27.49	0.44
	Heat Pump MVHR + AP of 3	0	0	0%	n/a	n/a	0.23	0.19	34.4	5.7	A2	18.57	0.35
Bungalow	Gas Boiler NV[1]	1.25	9.4	9%	n/a	n/a	0.30	0.28	53.1	10.0	A3	16.53	0.24
	Gas Boiler MVHR + AP of 3	0.9	6.8	6%	n/a	n/a	0.27	0.25	47.9	8.9	A2	11.90	0.2
	Gas Boiler MVHR + AP of 3	n/a	n/a	n/a	7	64%[2]	0.27	0.24	46.9	8.4	A2	11.48	0.20

	Heating and Ventilation	PV (kWp)	PV (m^2) 1kWp= 7.5m^2	PV (% of roof area)	Solar thermal (m^2)	Solar fraction (%)	Energy Performance Coefficient	Carbon Performance Coefficient	Primary energy (kWh/yr/m²)	CO_2 emissions (kg/yr/m²)	Building Energy Rating	Delivered renewable energy (kWh/yr/m^2)	RER
	Heat Pump NV[1]	0	0	0%	n/a	n/a	0.25	0.20	43.3	7.2	A2	33.93	0.44
	Heat Pump MVHR + AP of 3	0	0	0%	n/a	n/a	0.24	0.20	42.3	7.1	A2	24.94	0.37
Top Floor Apartment	Gas Boiler NV[1]	1	7.5	19%	n/a	n/a	0.30	0.28	46.7	8.8	A2	16.98	0.27
	Gas Boiler MVHR + AP of 3	0.63	4.7	12%	n/a	n/a	0.27	0.25	42.0	7.7	A2	10.61	0.20
	Air to water Heat Pump for space heating and hot water for each apartment NV[1]	0	0	0%	n/a	n/a	0.28	0.23	43.0	7.2	A2	29.24	0.40
	Air to water Heat Pump for each apartment MVHR + AP of 3	0	0	0%	n/a	n/a	0.27	0.22	41.4	6.9	A2	19.59	0.32
Mid Floor Apartment	Gas Boiler NV[1]	0.85	6.4	16%	n/a	n/a	0.30	0.29	40.0	7.5	A2	14.43	0.27
	Gas Boiler MVHR + AP of 3	0.55	4.1	10%	n/a	n/a	0.27	0.26	36.7	6.7	A2	9.34	0.20
	Air to water Heat Pump for space heating	0	0	0%	n/a	n/a	0.29	0.25	39.3	6.5	A2	23.53	0.37

	Heating and Ventilation	PV (kWp)	PV (m^2) 1kWp= 7.5m^2	PV (% of roof area)	Solar thermal (m^2)	Solar fraction (%)	Energy Performance Coefficient	Carbon Performance Coefficient	Primary energy (kWh/yr/m²)	CO_2 emissions (kg/yr/m²)	Building Energy Rating	Delivered renewable energy (kWh/yr/m^2)	RER
	and hot water for each apartment NV[1]												
	Air to water Heat Pump for each apartment MVHR+ AP of 3	0	0	0%	n/a	n/a	0.29	0.25	38.8	6.5	A2	15.67	0.29

[1]NV with intermittent extract at 5 m^3/m^2/hr or alternatively cMEV at 3 m^3/m^2/hr.

[2]The technology option consisting of gas boiler, MVHR and solar thermal tested for the bungalow exceeds the maximum recommended solar fraction of 60%. This scenario may however still be suitable for bungalows with larger floor area (and therefore higher hot water demand) than modelled for this study.

The improvement in energy and carbon dioxide emissions performance for these dwellings is in the order of 70% over 2005 requirements.

Part F-Ventilation

Part L of the Building Regulations Conservation of Fuel and Energy in Dwellings is closely linked to Part F Ventilation.
As dwelling air tightness improves to reduce energy use it is important to maintain adequate ventilation to ensure indoor air quality.

There are several studies available on the effectiveness of ventilation systems and their relationship with air tightness. Studies which have been referred to in the preparation of this document include:

- Zero Carbon Homes, Mechanical Ventilation with Heat Recovery in New Homes, Interim Report, Ventilation and Indoor Air Quality Task Group, Jan 2012 [10]
- Zero Carbon Homes ,Mechanical Ventilation with Heat Recovery in New Homes, Final Report, Ventilation and Indoor Air Quality Task Group, Jan 2013 [11]
- BRE, Ventilation, air tightness and Indoor Air Quality in New Homes, BR 477, 2005
- Coggins, Marie, Byrne, Miriam, & Kleefeld, Silke. (2010). Pilot study to investigate indoor air quality (IAQ) in energy efficient homes in Ireland: Report prepared for EPA STRIVE and Sustainable Energy Authority of Ireland: School of Physics, NUI Galway.[12]

Whilst there is much research in the area of ventilation a common conclusion from all reports is that the performance of ventilation systems are largely dependent on correct design, installation, commissioning and operation.

Whilst the above reports identify the move towards mechanical ventilation as a result of more air tight dwellings they also caution of potential Indoor Air Quality issues as a

[10] http://www.zerocarbonhub.org/resources/reports/mechanical-ventilation-heat-recovery-new-homes-interim-report
[11] http://www.zerocarbonhub.org/resources/reports/mechanical-ventilation-heat-recovery-new-homes-final-report
[12] http://hdl.handle.net/10379/7240

result of incorrect installation and improper commissioning. In order to address these issues TGD F is introducing additional guidance to ensure proper installation of ventilation systems requiring that they be designed, installed and commissioned by competent designers and installers. In addition TGD F is recommending that ventilation installations are validated by independent third party testers. Wexford Waterford Education Training Board are developing training specifications for installers of ventilation systems to be delivered on a national basis and NSAI are developing an independent third party validation scheme for systems installed in new dwellings. These are both scheduled to be in place by 2nd half 2018.

CIBSE Guide B and Approved Document F, Appendix A in the UK provide methodologies for sizing wall ventilators in dwellings and these were used in the development of Technical Guidance Document F in 2009 along with reference to research papers in this area.

It is noted that many natural ventilation systems are blocked by occupants and that mechanical systems can be switched off by occupants or can equally have air inlets blocked. This is an issue that can be addressed through good design and user behaviour and education. In this regard, guidance for competent designers and user education has been strengthened in the draft TGD F.

Key Costs and Benefits of the Proposed Amended Building Regulations

New Buildings

An independent consultant has been engaged to perform a cost analysis on the cost impact of the proposed Part L improvement. This shows an increase in capital to achieve NZEB performance in the order of 0.7% to 4.2% - with 1.9% being the most typical cost. The uplift in cost to achieve the NZEB performance specification is provided for dwellings in Table 3 below. This is included in the full cost report which is published as part of this public consultation.

Table 3 Summary of cost modelling output for dwellings including prelims, overheads, design fees and VAT

Dwelling type	Technology scenario	delta CAPEX		
		€	€/m2	%
Semi Detached	2011 baseline - Gas boiler, NV + 0.7kWp PV			
	Gas Boiler NV + 1.15kWp PV	€1,483	€12	0.9%
	Gas Boiler cMEV + AP of 3 + 1.15kWp PV	€3,375	€27	2.0%
	Gas Boiler MVHR + AP of 3 + 0.85kWp PV	€3,822	€30	2.2%
	Heat Pump NV	€1,765	€14	1.1%
	Heat Pump cMEV + AP of 3	€3,656	€29	2.2%
	Heat Pump MVHR + AP of 3	€4,853	€39	2.9%
Detached	2011 baseline - Gas boiler, NV + 0.9kWp PV			
	Gas Boiler NV + 1.45kWp PV	€2,141	€13	1.0%
	Gas Boiler cMEV + AP of 3 + 1.45kWp PV	€4,002	€25	1.8%
	Gas Boiler MVHR + AP of 3+ 1.1kWp PV	€4,513	€28	2.0%
	Gas Boiler MVHR + AP of 3 + 8m^2 SHW	€7,800	€49	3.5%
	Heat Pump NV	€2,278	€14	1.1%
	Heat Pump cMEV + AP of 3	€4,139	€26	1.9%
	Heat Pump MVHR + AP of 3	€5,524	€35	2.6%
Bungalow	2011 baseline - Gas boiler, NV + 0.6kWp PV			
	Gas Boiler NV + 1.25kWp PV	€1,569	€15	1.0%
	Gas Boiler cMEV + AP of 3 + 1.25kWp PV	€3,406	€33	2.1%
	Gas Boiler	€3,607	€35	2.2%

	MVHR + AP of 3+ 0.9kWp PV			
	Gas Boiler MVHR + AP of 3 + 7m^2 SHW	€6,740	€65	4.2%
	Heat Pump NV	€1,411	€14	1.0%
	Heat Pump cMEV + AP of 3	€3,248	€31	2.1%
	Heat Pump MVHR + AP of 3	€4,324	€42	2.8%
Top Floor Apartment	2011 baseline - Gas boiler, NV + 0.5kWp PV			
	Gas Boiler NV + 1kWp PV	€1,038	€13	0.7%
	Gas Boiler cMEV + AP of 3 + 1kWp PV	€2,544	€32	1.8%
	Gas Boiler MVHR + AP of 3 + 0.63kWp PV	€2,561	€32	1.8%
	Heat Pump NV	€1,510	€19	1.2%
	Heat Pump cMEV + AP of 3	€3,015	€38	2.2%
	Heat Pump MVHR + AP of 3	€3,958	€49	2.9%
Mid Floor Apartment	2011 baseline - Gas boiler, NV + 0.5kWp PV			
	Gas Boiler NV + 0.85kWp PV	€663	€8	0.5%
	Gas Boiler cMEV + AP of 3 + 0.85kWp PV	€2,169	€27	1.5%
	Gas Boiler MVHR + AP of 3 + 0.55kWp PV	€2,361	€30	1.7%
	Heat Pump NV	€1,510	€19	1.2%
	Heat Pump cMEV + AP of 3	€3,015	€38	2.2%
	Heat Pump MVHR+ AP of 3	€3,958	€49	2.9%

Major Renovations

In accordance with the Directive, where more than 25% of the surface area of the building envelope undergoes renovation the energy performance of the whole building should be improved to Cost Optimal level in so far as this is technically, functionally and economically feasible.

Cost Optimal calculations[13] were performed for Major Renovations in residential buildings in 2015. The performance requirements have been set so as to only require works which are technically, economically and functionally feasible when carrying out major renovation works.

9. Other Impacts

Impact on construction industry skills level

The improvement of energy performance of dwellings will require an improvement in skills levels for both designers and constructors. DEAP assessors will also need to update their knowledge with TGDs F and L 2017. The following section considers the current capacity of the construction and education sector to provide these skills.

Design professionals

Third level institutions are currently providing NFQ levels 7, 8 and 9 energy and sustainability related courses for construction professionals. Professional Bodies and other Continuing Professional Development organisations are also providing additional training for existing professionals. Domestic BER Assessors must have a minimum NFQ level 6 qualification in a building or construction related discipline or a recognised equivalent. Equivalence may be defined as a combination of an appropriate construction related qualification and significant related experience. They must complete the SEAI Domestic BER Assessor training course and pass the examination. There are currently 518 registered Domestic BER Assessors who are trained to apply the Dwelling Energy Assessment Procedure (DEAP) methodology.

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[13] http://www.housing.gov.ie/housing/building-standards/energy-performance-buildings/cost-optimal-calculations-and-gap-analysis

Construction Trades

The early implementation of ambitious mandatory national energy performance standards and renewable requirements in respect of dwellings has given the construction industry a period of time to adjust and a lot of experience will have been acquired during this time, however there is a requirement for constructors to pay specific attention to the construction of junctions in order to achieve reduced air permeability levels and thermal bridging heat loss. Whilst improvements in these areas do not require additional material costs, an increased level of awareness and attention to detail will be required on site.

The following training and supports are in place to facilitate the development of the required additional skills: -

- Government policy has supported the upskilling of professionals through Springboard funding of a DIT Postgraduate Certificate in Digital Analysis and Energy Retrofit course.
- Qualibuild was established in 2013 and is running Foundation Energy Skills Courses in the major Irish cities
- SOLAS training schemes for air tightness and thermal bridging onsite skills
- Integration of revised Part L guidance into apprenticeship courses in Institutes of Technology
- Upskilling courses for existing trades through SOLAS and the Institutes of Technology
- NSAI Window Energy Performance Scheme (WEPS)
- WWETB are developing vocational education courses for ETBs for 2h 2018

With regards to building services trades the following supports are in place: -

- Upskilling courses for existing trades through SOLAS and Institutes of Technology
- Renewables training modules from SOLAS
- Technical Guidance Document F 2010

Impact on Supply Chain

A good supply of energy efficient construction materials will be required to achieve improved energy performance requirements. The early implementation of ambitious mandatory national energy performance standards and renewable requirements in respect of dwellings has given suppliers time to adjust to meet changing future demand for materials, components and fabric elements. Advanced performance requirements have been in place since 2008 and the supply chain is developed

Impact on National Competitiveness

There will be no negative impact on Ireland's competitiveness. If anything, the amended Building Regulations are likely to encourage Irish business and industry to develop new innovative energy saving products and system. This will provide opportunities to reduce the need to import such technologies and may provide export opportunities in future years.

The contribution towards the achievement of national CO_2 emissions reduction targets and the reduced dependence on imported energy will improve the overall efficiency and competitiveness of the Irish economy.

Compliance/Regulatory Burden

It is generally accepted in the industry that regulatory requirements, national and European standards as well as codes of practice evolve over time in the light of technological advancements, new product developments and changes in construction practices.

It is not anticipated that there will be any significant impact on design and supervision fees or compliance burden associated with the additional conformity-checking the amended Building Regulations will impose on Building Control Authorities and Assigned Certifiers.

Assigned Certifiers

The Assigned Certifier, in accordance with the Building Control (Amendment) Regulations 2014 (S.I. No. 9 of 2014), must certify (jointly with the builder) that the construction works are in compliance with the new Parts F & L of the Building Regulations upon completion.

Competition assessment

There are no significant areas where issues of competition, restriction or imbalance have been identified. The Department considers that the proposed amendments to Parts F&L/ TGD F& L would have no significant effect on competition in any markets. It is considered that the proposals to change the regulations apply in a proportional and equitable way.

10. Enforcement and Compliance

Under the Building Control Act 1990, enforcement of the Building Regulations 1997 to 2017 is the responsibility of the 31 local building control authorities who have a broad range of powers under the Act to investigate and, where appropriate, take action in the event that non-compliances are identified in buildings.

The Building Control Regulations 1997 to 2017 set out the system of administrative controls to support compliance with the Building Regulations by requiring, inter alia, the submission of Commencement Notices, Fire Safety Certificates, Disability Access Certificates and the more recent Certificates of Compliance on Completion (introduced under S.I. No. 9 of 2014 which came into effect on 1 March 2014).

Responsibility for compliance with the requirements of the Building Regulations 1997 to 2017 is primarily a matter for the owners, designers and builders of buildings.

SEAI will upgrade their Dwellings Energy Assessment Procedure (DEAP) software, in parallel with this review of Parts L and F, to accommodate the new TGD L and F requirements when finalised.